

## MARANDA – Aranda goes hybrid

In the EU-funded MARANDA project, an emission-free hydrogen fuelled PEMFC-based hybrid power train system is being developed for marine applications.

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The system will be validated on both bench tests and on board the research vessel Aranda, one of about 30 research vessels in Europe. Special emphasis has been placed on air filtration and development of hydrogen ejector solutions, for both efficiency and durability. In addition, full-scale freeze start testing of the system will be conducted.

When research vessels are performing measurements, the main engines are turned off to minimise noise, vibration and air pollution that could disturb measurements. The 165 kW (2 x 82.5 kW AC) fuel cell powertrain (hybridised with a battery) will provide power to the vessel's electrical equipment and dynamic positioning during measurements, free from vibration, noise and air pollution.

One of the major obstacles for wider implementation of fuel cells in the marine sector is the lack of hydrogen infrastructure. To alleviate this problem, a mobile hydrogen storage container, refillable in any 350 bar hydrogen refuelling station, will be developed for this project. This novel solution will increase hydrogen availability to the marine sector, and many others.

The project consortium consists of companies from the whole fuel cell value chain, from balance-of-plant components to system integrator and end user. ABB Marine & Ports has the role of designing and delivering the power electronics that convert fuel cell DC power to the vessel's main AC distribution plant. The fuel cell system will be tested in conditions similar to Arctic marine conditions before implementation on the target vessel.

The project will increase the market potential of hydrogen fuel cells in marine sector, which has long been lagging behind road transportation. General business cases for different actors in the marine and harbour or fuel cell business will be created, and the impact in the entire industry should be notable. MARANDA will run 48 months total, concluding at the end of February 2021.



Aranda – Finnish marine research ship