

| Invited Speaker

S0501



**SAMI  
KANERVA**

Global Product Manager for fuel cell  
solutions  
ABB Marine & Ports

| **Overview into Fuel Cell Integration with Marine Power  
Systems**

## TALK TITLE

Overview into Fuel Cell Integration with Marine Power Systems

## ABOUT

Sami Kanerva is Global Product Manager for Fuel Cell Solutions at ABB Marine & Ports, where he is responsible for the global development and integration of fuel cell technologies for maritime applications.

He holds a Doctor of Science degree from Helsinki University of Technology and has extensive experience in renewable energy and marine technology. Since 2017, he has led the development of integrated marine fuel cell solutions, including ABB's first fuel cell demonstrators and contributions to major European research projects such as MARANDA and FLAGSHIPS.

Sami has also been involved in pioneering applications, including fuel cell systems for hydrogen-powered superyachts and the BalticSeaH2 hydrogen valley project. His work focuses on advancing practical, large-scale deployment of fuel cell technologies in the maritime sector.

## ABSTRACT

Fuel cells offer significant potential to reduce emissions and improve operational flexibility in marine applications. This presentation

provides a technical overview of the use cases and integration of fuel cells with marine power systems.

Practical use cases are presented, where fuel cells can deliver value for ship operations. These include hydrogen supported hybrid power systems, replacement of auxiliary gensets with fuel cell systems, and supporting shore power and battery charging with alternative fuels. These scenarios highlight how fuel cells complement conventional technologies with decarbonization and can be upscaled gradually taking feasible steps.

Optimal dimensioning starts with the vessel's operational profile, considering both daily power demand and long-term variations. Battery energy storage systems will ensure the dynamic support for fuel cells, while they also enable cost-efficient operations at short distances. Hybrid power system approach with advanced power and energy management strategies help to optimize the total cost of ownership in comparison to pure hydrogen or battery configurations.

Typical integration challenges within electrical power system architecture include selecting optimal power conversion equipment, balancing multiple power sources, and managing electromagnetic compatibility issues or fault situations. It is essential to understand the role of galvanic isolation in DC-based power systems, especially when scaling up towards higher power ratings.

Technical solutions for integrating fuel cells into marine power systems have already reached high level of maturity, although they are yet continuously developing. However, ensuring reliability and performance by system integration is a complex task, which requires experience and understanding on the characteristics and interactions of different subsystems.

