Jacob Bitsch Nørgaard

Position: Systems Engineer

Institution: Ballard Power Systems Europe A/S

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Biography and expertise

- Jacob Bitsch Nørgaard received his B.Sc. and M.Sc. from Aalborg University in 2019, specializing in Energy Engineering and Power Electronics
- From 2019, he has been employed at Ballard Power Systems Europe A/S, working in product development (T&PD) and technology solutions (TS) within segments such as Marine, Rail, Busses, and Stationary power generation including peak shaving and back-up-power
- Since joining Ballard, he has been working as Test Engineer, Project Manager, and Systems Engineer, specializing in modular design and requirements mapping towards lean and agile development processes
- His areas of interest are LT-PEM Fuel Cell system efficiency optimization, lifetime modelling, predictive maintenance and diagnostics, Total Cost of Ownership and Levelized Cost of Energy, in the context of decarbonizing the Heavy-Duty Transport and Energy Generation markets.
- Currently, he is involved in digitalization of the next generation of Fuel Cell products for Marine, Rail and Stationery, targeting increased reliability and lower Total-Cost-of-Ownership through advanced modelling and data structures.

Presentation: TCO: Fuel Cell development through value creation

The continuous push to reduce harmful emissions is empowering green and sustainable energy solutions. As the diversification of energy sources are spreading to meet the demand of numerous markets, Fuel Cells are transitioning from a novel and niche technology, towards large-scale commercial solutions in multiple industries.

Driving this transition are the various requirements from a range of different applications, including Marine, Rail, Stationary, and Heavy-Duty Motive. Not surprisingly, all these exhibit different traits, which require custom-tailored solutions to meet the various requirements in power, efficiency, reliability, regulatory, and cost.

Quantifying the impact of changes in performance because of added features from product development, is critical for meeting customer requirements. The key to this, is modelling Total-Cost-of-Ownership (TCO), seen from a customer's perspective. To this end, we must be able to predict Hybrid Fuel Cell system performance over a wide range of operating conditions, in the early stages of development – i.e. a Virtual Fuel Cell Systems Tool.