

**VOLVO
PENTA**



Examples of Existing Portable Battery Solutions

Portable Battery for Marine Leisure Global Capstone Project with Chalmers, Penn State & Volvo Group

Background

Electrification is one of the biggest disruptive trends within marine leisure, and the number of new companies offering everything from a complete boat, to electrification components, is growing exponentially.

The path towards electrification is basically following the same route as automotive, and one of the major challenges is the availability to charging. Even if some marinas have shore power, the vast majority of them don't, and the power is often not big enough for charging of large batteries.

Fast charging options is slowly being built, however for many years to come most marinas will only offer a standard socket with ~2-3 kW. This means almost half a day to charge a reasonably large battery for a sailboat, and a full day to charge a small power boat.

If electrification should succeed, we need more options for customers interested in electric boating. One alternative could be to develop a battery swapping system. This will allow small business owners to keep a limited number of standardized battery sizes for EMOB customers. Battery life will be good since they don't use fast charging, and boat owners can avoid the waiting and swap batteries at the same time as fueling a normal Diesel/Gasoline vessel.

Task

- Study the challenges in a how to swap batteries – literature, simulation, IP etc.
- Use a 20–60kWh battery size for 30–45-foot sailboats including boat design modifications
- Investigate the ergonomics / design challenges vs. battery size to decide kWh scope
- Design a system and possibly technical equipment that makes it easy to handle the battery
- Safety is key, and the study should also cover cooling vs. no cooling of the batteries
- Investigate other means of using the battery, as well as other possible extended functions
- Build a business case that handles the complete scenario
- Provide design sketches / simplified CAD-models and simulation results of the final candidate

Målgrupp

M, Z, E, F

Gruppstorlek

3-4 från Chalmers
(3-4 från Penn State)

Speciella förkunskaper

Intresse för mekanik,
elektroteknik, fysik,
produktutveckling och
simulering.

Förslagsställare

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Kan det dubbleras?

Nej

Språk:

Engelska