SEMI-SUBMERSIBLE SAILING VESSEL SSSV OHANDA ONE

A SPECULATIVE DESIGN PROJECT TOWARDS MARITIME ZERO EMISSION PASSENGER TRANSPORT

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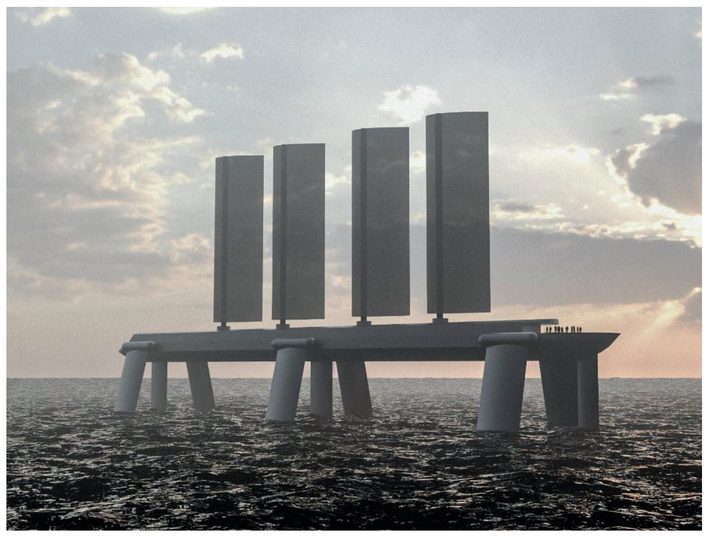

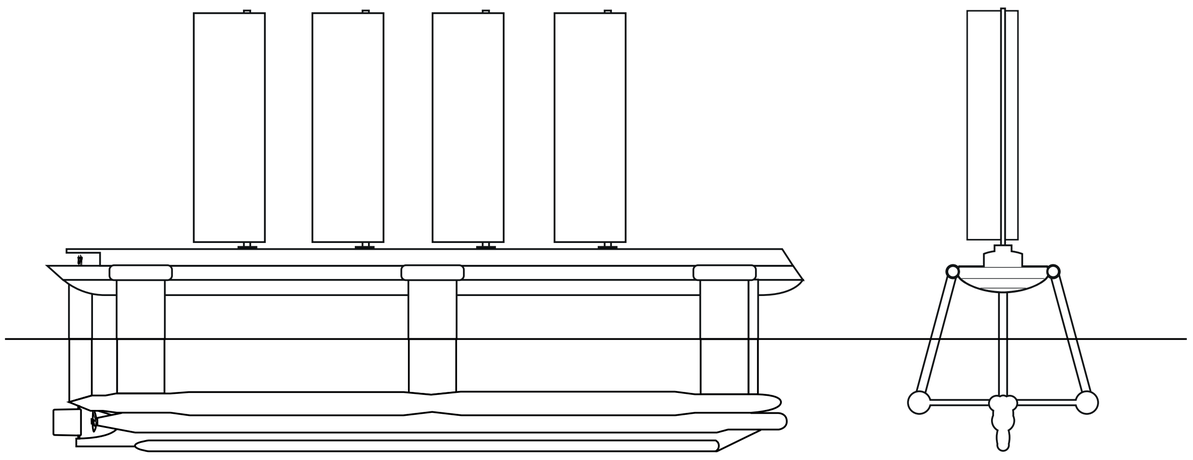

Length:	176m
Beam:	42m Hull, 20m Deck
Height:	43m
Air draft:	20-82m
Draft:	11-23m
Displacement:	15kt
Decks:	5 (3 afloat, 2 submerged)
Masts:	4 (wing-sails)
Crew:	30
Passengers:	220

OVERVIEW

Ohanda.One is a speculative design project that explores options for sustainable and zero emission passenger transport as a contribution to reducing emissions in the light of climate change. While long distance passenger transport by sea was once the norm, it has largely been replaced by air travel which currently produces in the order of 10 times the C02 per passenger kilometer. The major benefit of air passenger transport over sea is the much shorter duration of the journey. Ohanda.One addresses this extra duration in 3 main ways. First the vessel should provide a productive working environment so that passengers do not take time out from work while underway and to support this the vessel should have increased comfort and stability. Second the vessel should be faster to reduce passage times and lastly the design should improve on existing maritime technology in terms of efficiency and sustainable construction techniques with a goal of producing a zero emission vessel.

To this end the current design of the existing 1:100 radio controlled scale model of the vessel - complete with electric propulsion and dynamic buoyancy and ballast systems - utilizes a triple hull version of a SWATH (Small Waterplane Area Twin Hull) design in which underwater torpedos provide the bouyancy for a platform that is above the surface of the water. The SWATH design has been validated in other projects both in simulation and prototype and production vessels, with good results in terms of stability at speed in a seaway and therefore passenger comfort. Further the current design utilises dynamic bouyancy and ballast systems as well as flaps and fins which act as control surfaces to enable active levelling of the vessel. It is envisioned that a full size vessel would use both wind power sails, and sustainable gas and electric propulsion systems for low emission operation.

The project is an Open Hardware project and uses techniques common in software development where contributors release their designs into the public domain under license, and published designs and other materials may be used with minimal restriction.

Before proceeding further with the project and moving on to more rigorous design and prototyping, we would like to invite engineers with relevant maritime experience to examine the current design, comment, critique and explore options for continuation of the work, and engage potential collaborators for a workshop in summer 2025.

WORKSHOP

TOPICS

Hydrostatics
- What is the inherent stability of the SWATH hull?
- Does the central keel hull have a role?

Hydrodynamics
- What is the efficiency of the hull design under motion?
- What is the speed/power relation for the vessel?
- What is the stability of the hull design?

Propulsion
- Can the SWATH structure support sails whilst maintaining stability?
- What kind of sail structures would be possible?
- What other options for zero emission propulsion can be used?

Dynamic control
- What role can dynamic control systems, fins and ballast/bouyancy tanks have in operation?
- Can dynamic systems mitigate other inherent characteristics of the vessel?

PARTICIPANTS

We seek participation from:
- Maritime architects /engineers particularly with experience of SWATH designs
- Hydrostatic and hydrodynamic modellers
- Wind assisted propulsion engineers
- Ship motion control engineers with experience of stabilsation and advanced hull forms
- Dynamic control software engineers

FUTURE WORKSHOPS

Ohanda.One plans future workshops on other aspects of the project.

- Open Hardware for maritime research
- Economics of sustainable sea passenger transport
- Ohanda.One prototype 2.0
- Ohanda.One modelling, testing and tank validation
- Sustainable sea passenger transport routing
- Social aspects of sustainable sea passenger transport
- Architecture for long term passenger habitation

https://ohanda.one