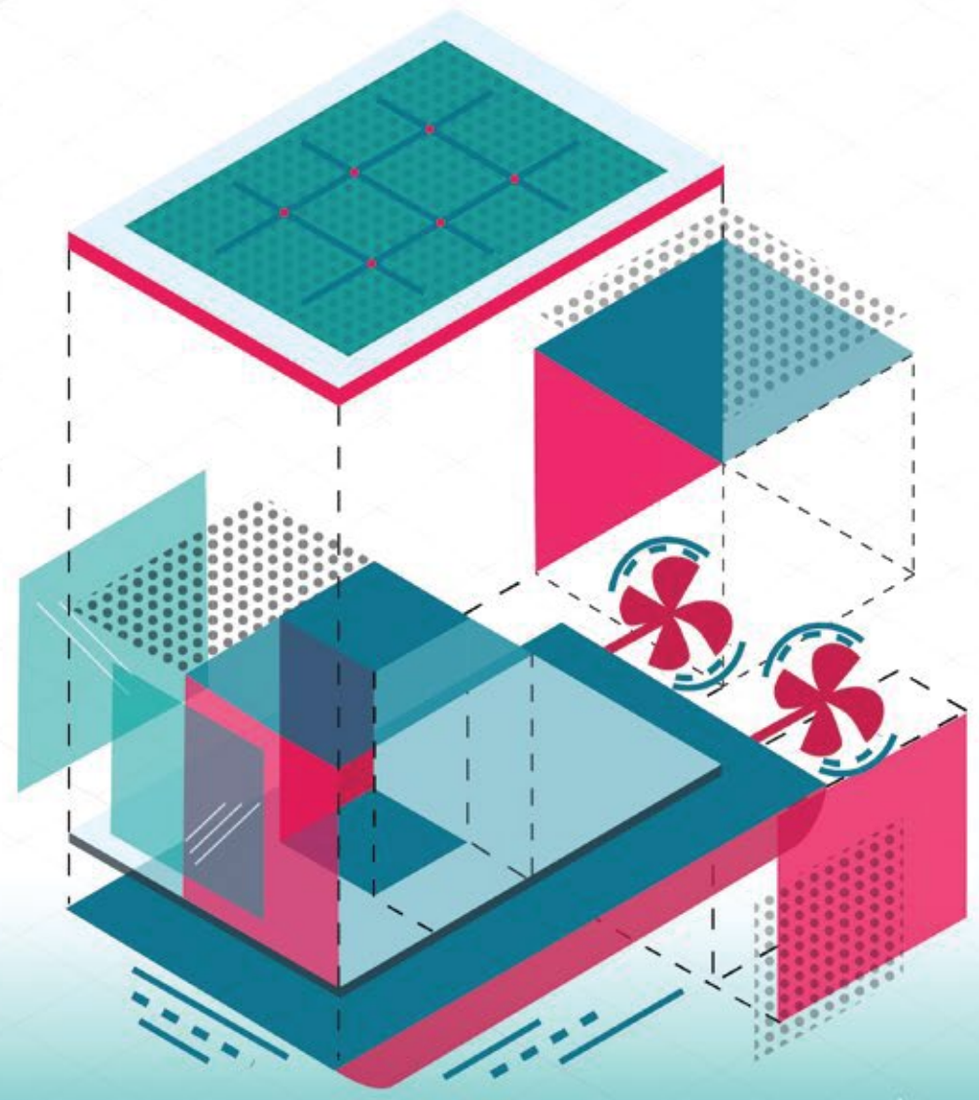
AUTONOMOUS FLOATING HOUSE

Technical brief



ARE YOU
A GAMECHANGER
IN NAVAL ARCHITECTURE ?

ShipDX 2020

F/N

Premise

Climate change, depletion of resources, pollution, and waste generation reached a level that can no longer go unnoticed. Water levels are rising and physical ground space is becoming scarce.

Until now, people have been building structures, either on land or on water, having only the construction cost in mind, but not the impact these structures are going to have on the environment on the long run.

Decades of technological advancement have led to a huge negative impact on the environment and it is **our responsibility** to come up with modern solutions for that.

Buildup

While civil architecture has made progress in the direction of developing and integrating innovative and sustainable technology, shipbuilding is falling behind in that aspect.

Currently, the technology to create designs that limit the impact on the environment are available, but are not promoted enough in the maritime industry, even though they are of vital importance.

With the development in technology, building a house on water has become more common.
We should take into consideration that such a structure has to be relevant in a sustainable future.

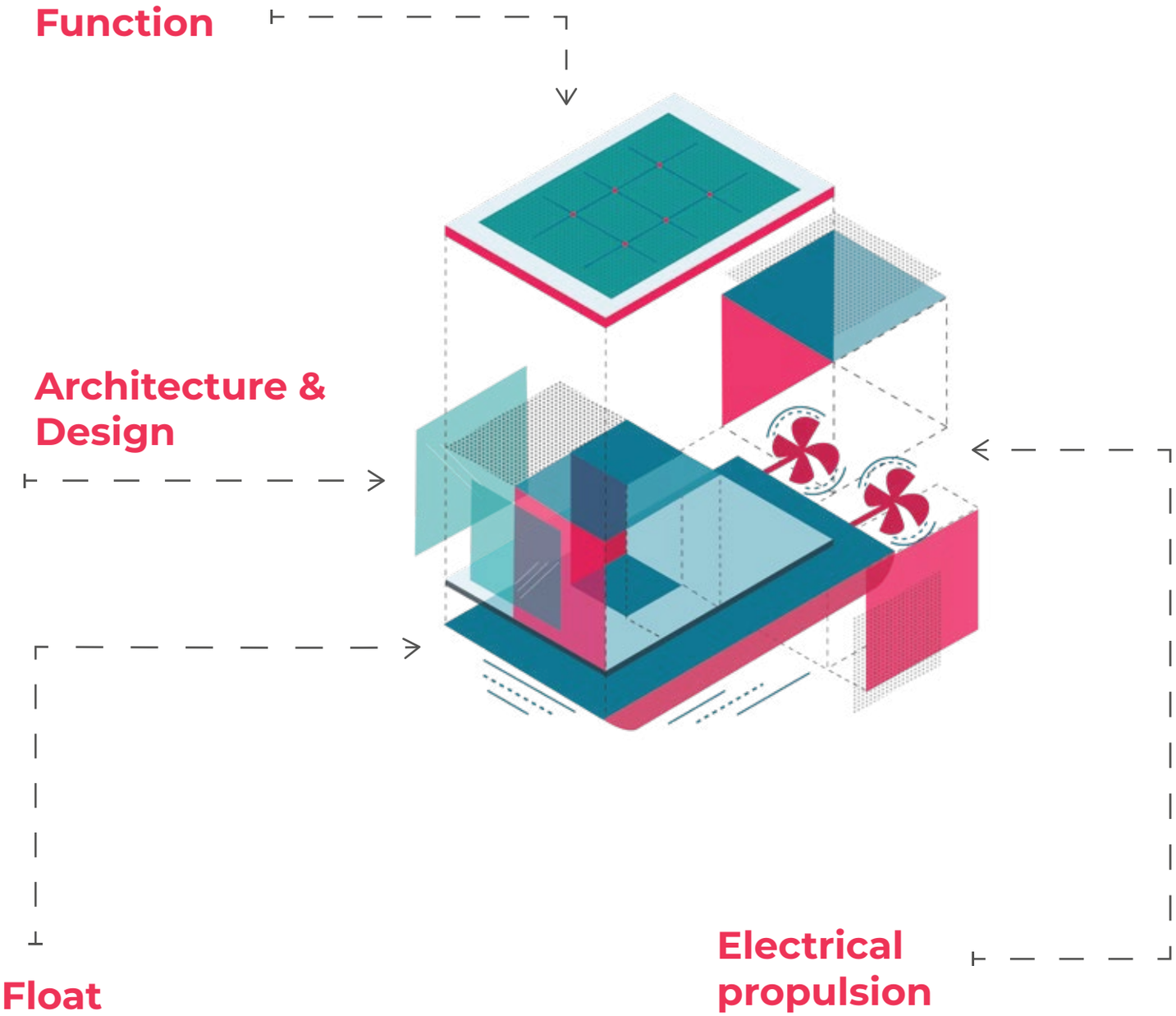
Sustainable shift

What we failed to realize is that a structure that is insensitive to the environment costs much more to the planet in the longer run than we can imagine. Such buildings, constructed without considering the context of climate and other environmental factors (site, material availability etc.), would become obsolete in a sustainable future.

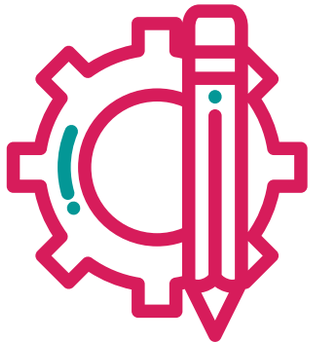
Imagine living in a structure that produces all the power it needs. One that makes the absolute best use of its surrounding light, weather conditions, and location, to be as energy efficient as possible, blending smart design, green materials, and emerging technologies for a maximum effect.

What is an autonomous floating house?

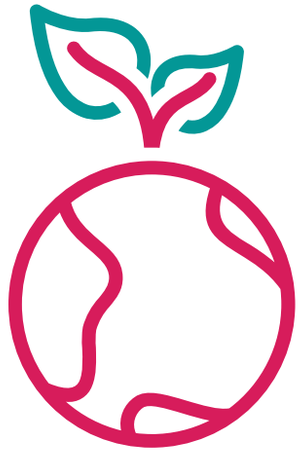
In a nutshell, a self-propelled autonomus floating house is a structure designed as a living space, that can move by itself, generating or storing its own power, unlike a regular floating house which is permanently moored and cannot move.



Sustainability & Autonomy objectives



Passive design



Environmentally-friendly

Electric power / Propulsion

Commercial Viability

Owner's requirements

The autonomous floating house will be designed to permanently accommodate 4 passengers, but will allow for a minimum of 20 people on board for short periods of time. The vessel will be fully autonomous for long periods of time when stationary and will allow for 100 miles autonomy when sailing at maximum speed. The houseboat will be designed to account for the following minimum requirements:

- 2 bedrooms (for 4 people): 1 master bedroom & 1 guest bedroom
- open-plan kitchen with living room
- 1 bathroom
- main deck terrace
- roof terrace

Technical specs:

- Hull: concrete, aluminium or steel (advantages and disadvantages to be presented)
- Hull length: 15 to 20 m
- Hull width: 4 to 6 m
- Footprint: 90 to 100 m2
- Main deck terrace: 12 to 20 m2
- Max speed: 6.5 kts (approx. 12 km/h)
- Autonomy:
  - fully autonomous for long periods of time when stationary
  - 100 miles when sailing at 6.5 kts
- Full electric propulsion
- Sustainable design
- Sailing area: inland waters
- Wave characteristics: Hs= 0.5 m, Tp=4.0 m
- Water depth: 3 m
- Max speed: 6.5 kts (approx. 12 km/h)

Qualification Stage

Eleven teams have registered and are approved to participate in the ShipDX 2020 competition:

- 7 teams from Romania
- 4 teams from Poland

All the registered teams will enter the first stage of the competition at the same time and will have to start working on their projects, based on the bellow requirements for the Qualification Stage.

All teams will have to submit their projects until **3rd of March (12:00 PM)** and will be judged by one Jury, on the same list of Criteria. The best 6 teams will be selected by the Jury, based on the mentioned Criteria, and will proceed to the Second stage (Grand Finale).

Submissions

Qualification stage

To enter the qualification stage, each team will submit a full set of deliverables **until 3rd of March, 13:00 PM (GMT+2)** as described below:

01 Short animation clip of the houseboat concept (exterior only)

02 Preliminary general arrangement and subdivision plan (.dwg and .pdf formats)

03 Technical report containing the below sections as a minimum:

- general characteristics (main dimensions, hull type, hull shape etc)
  preliminary lightship weight calculations
- stability analysis and compliance with requirements
- hydrodynamic analysis and compliance with requirements
- description of sustainable/green solutions targeted for next stage implementation
- forward resistance calculations

No propulsion calculations needed in this stage.

Judging Criteria

Qualification stage

- [ ] Overall presentation skills
- [ ] Innovation in terms of exterior design (hull & superstructure) which best fulfills client requirements
- [ ] Quality of engineering deliverables
- [ ] Statement of sustainability (list of solutions which will be implemented in order to describe the floating house as sustainable and green)
- [ ] Smart space management (subdivision)

Grand Finale

The Grand Final will take place on the 21st of May 2020 in Galati, Romania and it will be championed by Faculty professors from Galati Faculty of Naval Architecture, GLO Marine and Nava Ship Design representatives, as well as the competition sponsors.

Flights to and from Bucharest, accommodation in Galati and all the other expenses will be covered by organisers for all members of the three teams qualified in the Grand Final.

The below topics are considered minimum requirements to enter the Grand Final:

- Interior design of houseboat, with focus on comfort and smart space utilisation
- Implementation of sustainable systems opted for in the qualification stage
- P&IDs for onboard systems (e.g. fresh water, grey water, electrical)
- Selection and comprehensive description of propulsion system (diagram, autonomy etc)

To enter the Grand Finale, the teams will have to submit their final projects until until 18th of May 2020, 13:00 PM (GMT+2)

Submissions

Final stage

To enter the Grand Finale, each team will submit a full set of deliverables **until 18th of May 2020, 13:00 PM (GMT+2)** as described below:

01 Animation clip of the houseboat concept (exterior and interior) to highlight the smart space utilisation

02 Final general arrangement plan (.dwg and .pdf formats)

03 Diagrams of the on board systems (.dwg and .pdf formats)

04 Technical report containing the below sections as a minimum:

- full description of the houseboat concept (dimensions, shapes, arrangement, hull (yupe and shapes), superstructure, autonomy etc etc)
- summary reuslts of the stability and hydrodynamic analyses
- comprehensive description of sustainable/green solutions implemented and their effect
- propulsion system (description, on board integration and efficiency)

Judging Criteria

Final stage

- ☐ Innovation in terms of design (exterior and interior)
- ☐ Smart space management (smart furniture and smart space allocation solutions)
- ☐ Sustainable solutions opted for, level of implementation and benefits
- ☐ Autonomy (sailing and stationary)
- ☐ Quality of engineering deliverables
- ☐ Project management track record
- ☐ Overall presentation skills

Mission & Values

- Be a gamechanger in the maritime industry
- Learn by design
- Value teamwork
- Communicate efficiently
- Learn to manage your project
- Go the extra mile

ShipDX

You are the Gamechangers!
Engineer something that **can turn the tide!**

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