

HYNOVAR

Development and operation of a 100% Hydrogen powered passenger vessel

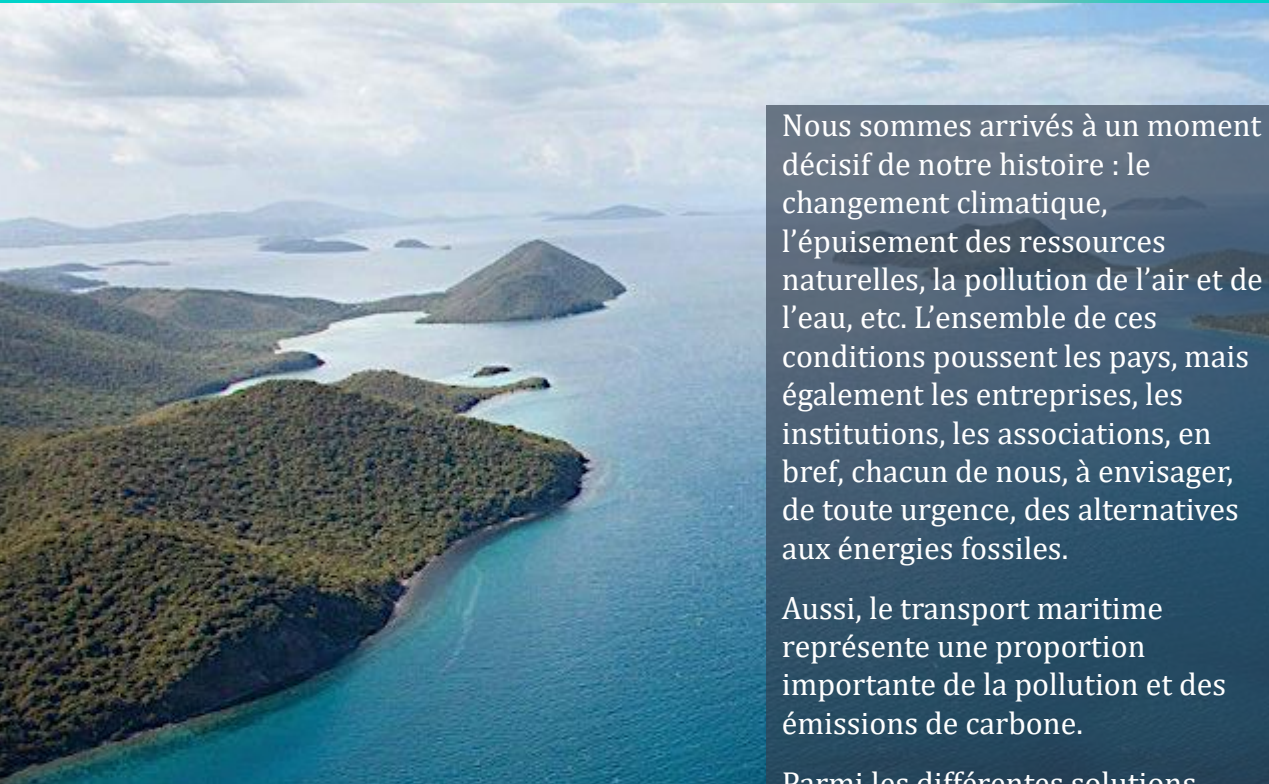


Arnaud Vasquez
CEO Hyseas Energy SAS



Florø, Norway.
Maritime Hydrogen Marine Energy. Sept 2019

Time is running out



Nous sommes arrivés à un moment décisif de notre histoire : le changement climatique, l'épuisement des ressources naturelles, la pollution de l'air et de l'eau, etc. L'ensemble de ces conditions poussent les pays, mais également les entreprises, les institutions, les associations, en bref, chacun de nous, à envisager, de toute urgence, des alternatives aux énergies fossiles.

Aussi, le transport maritime représente une proportion importante de la pollution et des émissions de carbone.

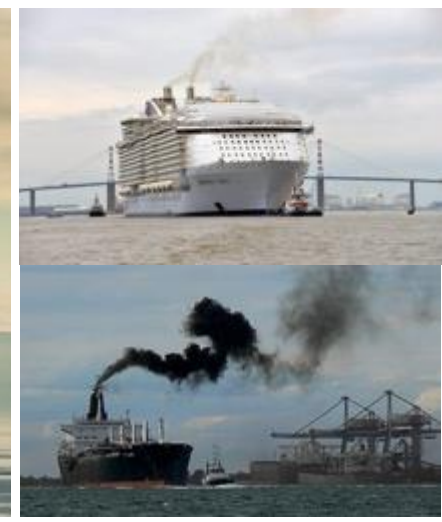
Parmi les différentes solutions technologiques envisagées, HySeas Energy a fait le choix de l'hydrogène et se positionne comme équipementier / intégrateur.

HySeas Energy apporte ainsi des solutions énergétiques fiables, totalement vertes, marinisées et certifiées.

Facteurs de développement maritime *Des solutions d'émission zéro carbone*

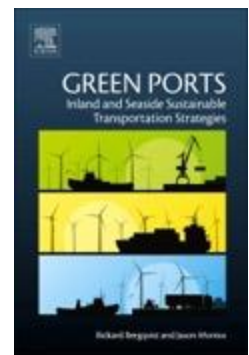
- 2021 : Durcissement de la réglementation maritime internationale
- Taxe sur les émissions de carbone à venir
- Pollution provoquant des problèmes de santé des populations et de la planète
- Technologie d'énergie alternative et/ou renouvelable de plus en plus fiable.

Shipping needs to reduce its emissions in a big way...



... Luckily some initiatives have started.

Low carbon shipping and air pollution control



GreenPort

Implementation



The cost of adapting marine operators to the new IMO regulatory standards from 2020 is estimated to be \$60 billion per year.

“The IMO’s vision is to phase out greenhouse gas (GHG) emissions as soon as possible within the end of this century. The aim is to reduce total emissions from shipping by 50% in 2050, and to reduce the average carbon intensity by 40% in 2030 and 70% in 2050, compared to 2008.”

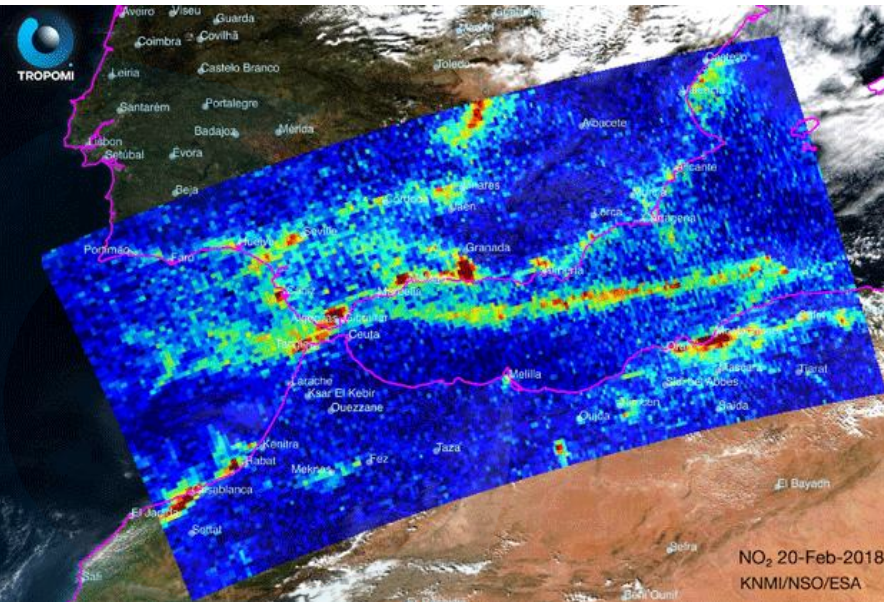
www.dnvgl.com/news/



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for a safer world

Monitoring, reporting and verification of CO₂ emissions from ships

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Sentinel 5P tracks ships' dirty emissions from orbit 20 Feb 2018

A new Earth-observing satellite Sentinel-5P operated by the European Space Agency (ESA), carries an advanced atmosphere-monitoring instrument that can scan Earth at 6 times higher resolution than any other such instrument in orbit. Multispectral imaging spectrometer reveals pollutants in our planet's atmosphere with unprecedented granularity. Its daily readings can track gases such as nitrogen dioxide, ozone, formaldehyde, sulphur dioxide, methane, and carbon dioxide that are important to air quality and climate.

“It's like a switch from old TV to a new high-definition TV in terms of air quality measurements” Until now it has only been possible to focus detection on measurements in port.

www.bbc.com/news/science-environment-43926232

<https://eos.org/articles/advanced-satellite-tracks-air-pollution-in-extraordinary-detail>

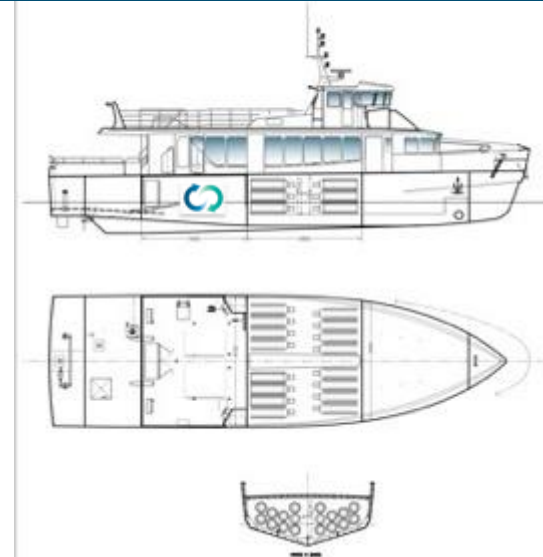


The Hynovar Consortium

Vessel operated by the *Bateliers de la Côte d'Azur*

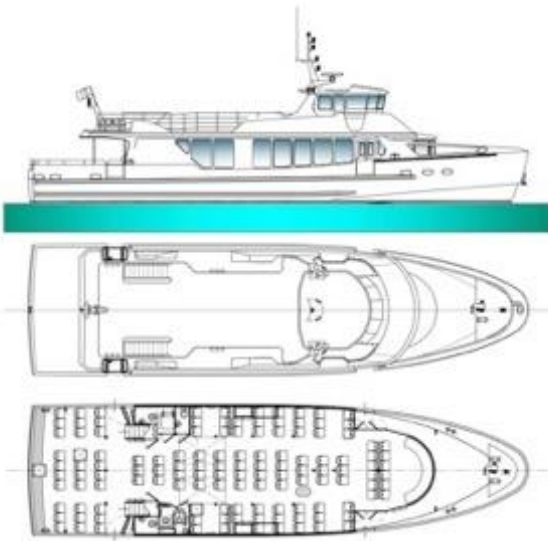
Characteristics of the passenger vessel :

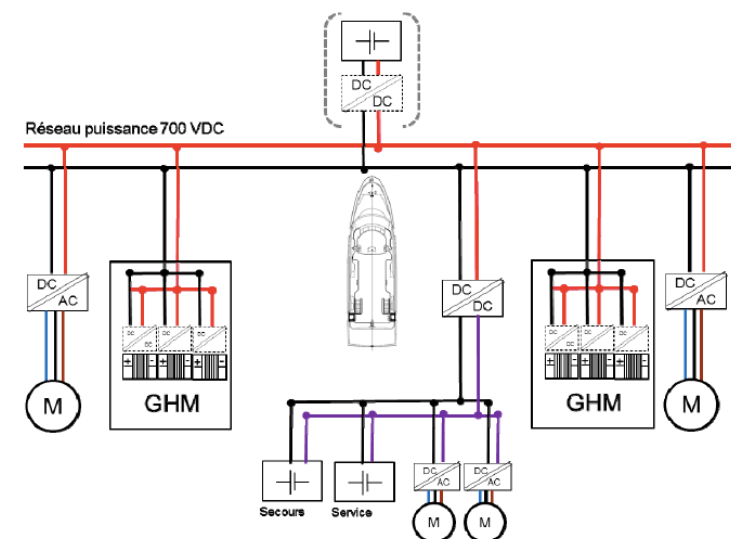
- Certification DNV-GL "1A LC Passenger"
- Overall length : 26 metres
- 200 Passengers (*accessible to wheelchairs*)
- Autonomy : 10 hours @ 12 knots
- Max service speed : 14 knots
- Volume de H2 stored : 260 kg
- Storage pressure : 35 MPa
- Refuelling time : 90 minutes



Characteristics of the HMG :

- Net power: 240 kW
- Voltage : 700 Vdc
- Dimensions: 2600 x 1300 x 1300 mm
- Weight: 2600 Kg
- IP56 Housing
- IEC ex / ATEX classed
- DNV-GL certified
- Maintenance contract







Appel à projets

H2 – mobilité
Ecosystèmes de mobilité hydrogène

Dossier de candidature

HYNOVAR

Déploiement des nouvelles mobilités hydrogène,
Terrestre et maritime



Descriptif technique de l'installation, vue de dessus et vue en coupe

- 8 corps mort de 1,5 tonne
- 1 ponton de 18m x 2,5m et 1 passerelle de 6m x 1,4m :
- Structure Aluminium 6005 AT6 (marine)
- Platelage caillibots Marinadeck
- Gardes corps sur passerelle
- Surcharge 250kg/m²
- 4 Bollards d'amarrage

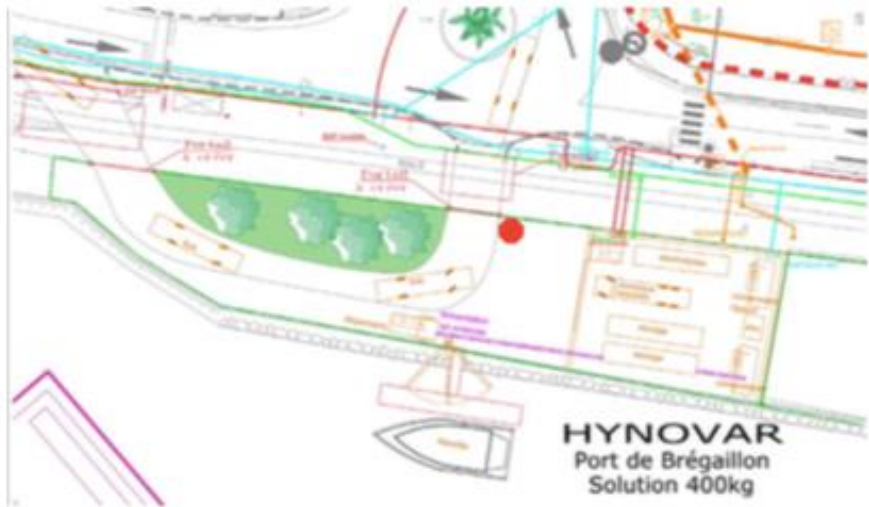
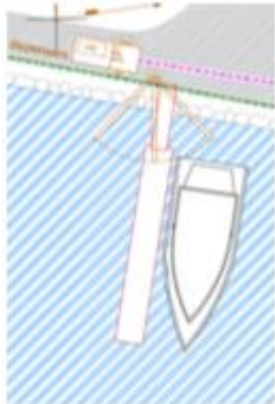
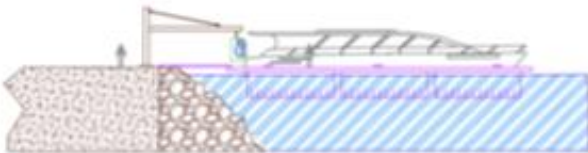


Figure 24 : Visuel global de la station 390kg/jour, GreenHydrogen

With participations of:



Région
Provence
Alpes
Côte d'Azur



RÉGION
SUD
PROVENCE
ALPES
CÔTE D'AZUR



“But what will we find?” asked Pencroff.

“Do you imagine it, Mr. Cyrus?”

“Almost, my friend.”

”And what will be burned instead of coal?”

"Water," answered Cyrus Smith.

"Water," exclaimed Pencroff, "the water for heating the steamboats and the locomotives, the water for heating the water!"

"Yes, but the water decomposed into its constituent elements," answered Cyrus Smith, "and decomposed, no doubt, by electricity, which will then become a powerful and manageable force, for all the great discoveries, by an inexplicable law, seem match and complement each other at the same time. Yes, my friends, I believe that water will one day be used as fuel, that the hydrogen and the oxygen which constitute it, used alone or simultaneously, will provide an inexhaustible source of heat and light and an intensity that coal can not have. “

“One day, the bunkers of the steamers and the tenders of the locomotives, instead of coal, will be loaded with these two compressed gases, which will burn in the hearths with an enormous calorific power. So, nothing to fear. As long as this land is inhabited, it will provide for the needs of its inhabitants, and they will never lack light or heat, nor will they miss the productions of the vegetable, mineral, or animal kingdoms. So I think that when the coal beds are exhausted, we will heat and heat ourselves with water. Water is the coal of the future.”

“I would like to see that,” said the sailor.

Jules Verne, *The Mysterious Island* (1874)

