



SEABUBBLES

THE HYDROGEN FLYING BOAT

PRESS KIT

0 WAVE
NOISE
EMISSION



SEABUBBLES, A NEW ALTERNATIVE FOR WATERBORNE MOBILITY

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LA SEABUBBLE, THE FIRST FRENCH-MADE HYDROGEN-POWERED HYDROFOIL

In response to the environmental challenges facing the planet today, SeaBubbles, an innovative French start-up in the area of sustainable mobility, is combining two major innovations. At the Cannes Yachting Festival, the start-up will be unveiling the first hybrid 'flying' boat with automated, retractable foils that runs on both electrical energy and hydrogen. SeaBubbles' motto of 'zero wave, zero noise, zero emission' summarises its vision for passenger transport.

The SeaBubbles belong to a new generation of boats that will help preserve the natural ecosystem while offering a unique sailing and flying experience with futuristic appeal.

Packed with innovations inspired by the shipbuilding, automotive and aeronautic industries, the SeaBubbles represents an alternative form of mobility, like no other in the world, which brings together sailing pleasure, innovation and respect for nature.

0 WAVE
NOISE
EMISSION

A UNIQUE EXPERIENCE



Upscaled comfort...

Its aerodynamic hull and closed air-conditioned cockpit guarantee comfortable sailing in all seasons. The composite material of the passenger compartment was designed to withstand sailing pressures specific to flight. The interior layout is adjusted to the centre of gravity, in relation to the flight control system. It is customisable and can be jointly studied by the ship-owner and SeaBubbles' teams.

The SeaBubble transforms sailing both in terms of the sensory experience it offers and its low carbon footprint. This 'zero wave, zero noise, zero emission' transport solution is pleasant for users while being environmentally friendly, making it ideal for use in cities and protected areas. As discreet as a bubble gliding over water and as extraordinary as a flying fish, the SeaBubble draws its inspiration from the richness of nature and offers an alternative technological and eco-friendly mobility experience that is truly magical.

Lifted by self-stabilising foils and powered by electrical energy generated by a hydrogen fuel cell, the SeaBubble is the first of its kind and is *made in France*.

...combined with a sensational sailing experience

The two falcon-wing doors, on the port and starboard sides, provide access to the passenger compartment. Passengers walk down two steps to access the cockpit. At 10 knots, the SeaBubble leaves its Archimedean mode and gently takes off. At cruising speed, there is a feeling of lightness and weightlessness above the water's surface.

The foils originate from the aviation industry. The SeaBubble is lifted by a combination of «inverted T-foils» that ensure smooth sailing, a fast take-off and a sensational ride. It flies 60 cm above the water, protecting passengers from seasickness!


SEABUBBLES

INNOVATION AT THE SERVICE OF THE TRANSITION

0 CO₂
emitted into the atmosphere *

4 min
refilling in H₂ stations

50
nautical miles (90 km) at 18 knots
2h30 autonomy

8 to 12
seats depending on the configuration

2 years
of development for the hydrogen-powered model

25
passionate employees

27
industrial partners

10/18/22
Speed in knots :
Take-off/cruising/
maximum

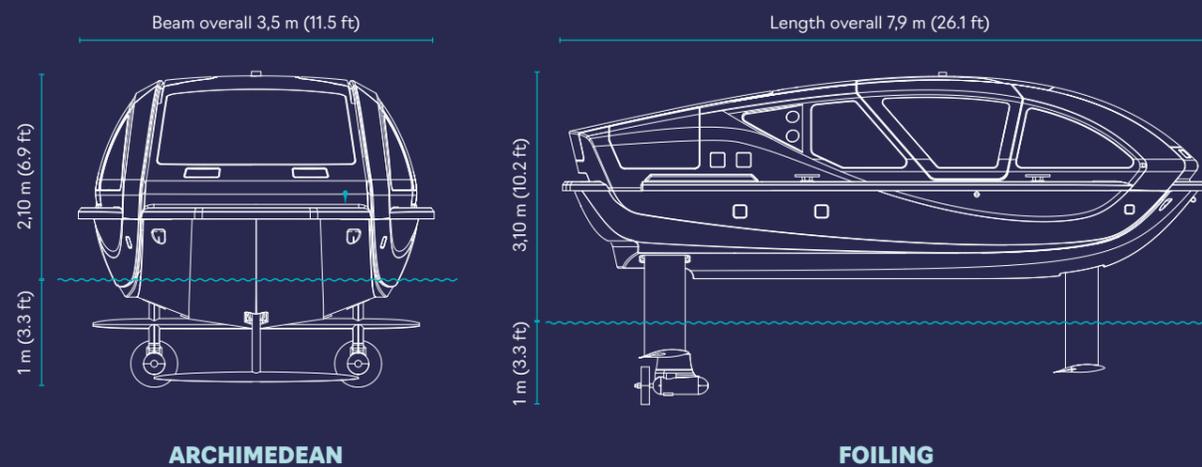
3 x 3.2 kg et 350 bar
Hydrogen on board

4
88 V modules (Batteries)

60 kW
(Fuel cell)

8 m x 3,5 m
Long x wide

*A one-hour ride on a SeaBubble saves 40 L of fuel, i.e. 100 kg of CO₂



0 WAVE NOISE EMISSION

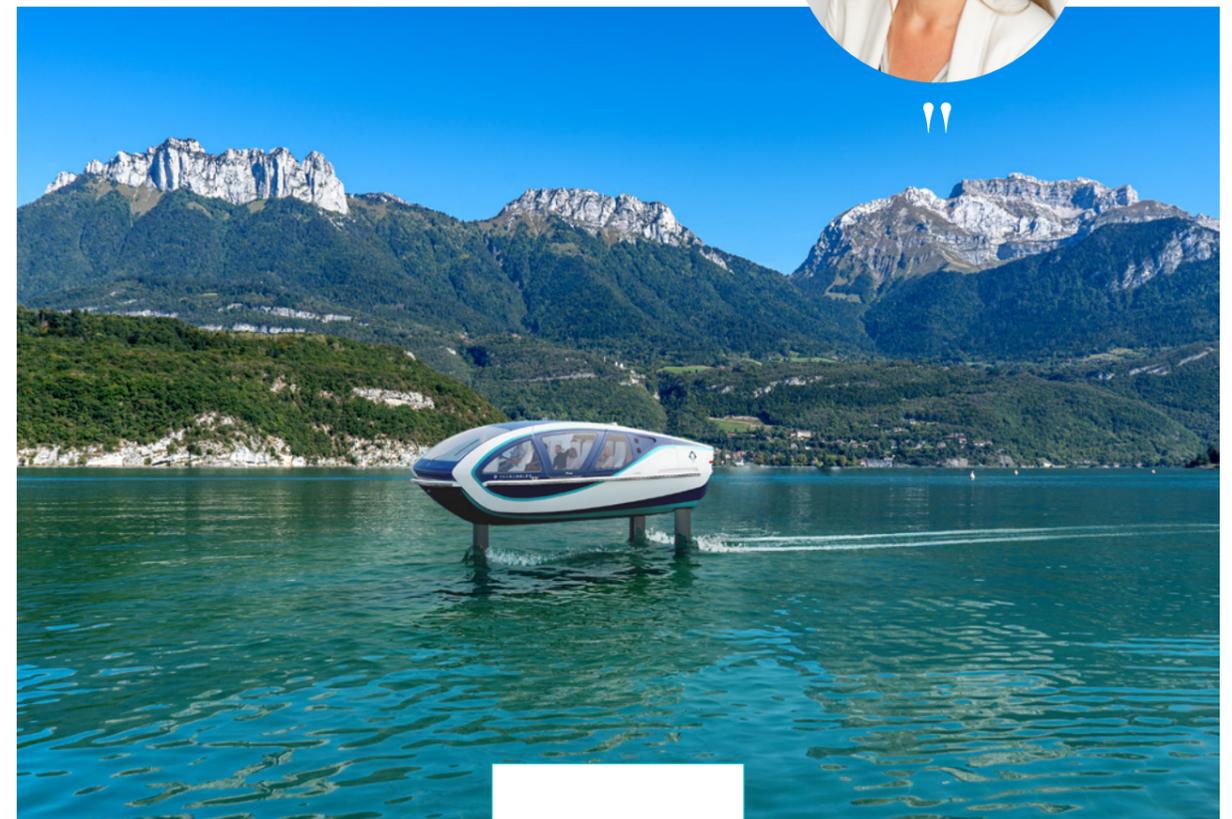
SEABUBBLES, THE VISION AND USES

Towards a local mobility solution that is sustainable, decarbonised and shared

Urban mobility is a crucial challenge today, and will be even more so over the coming years, particularly for local authorities. River-sea passenger transport has undergone remarkable growth in recent years. While ownership of a personal vehicle used to be the norm, habits have been shifting towards alternative ways of getting around, mainly due to environmental necessities. Mobility is becoming shared and multimodal. Transport modes are needing to adapt to changing uses and, above all, be sustainable. They have to meet two main challenges: reducing urban pollution and decongesting towns and cities in particular. To take up these challenges, SeaBubbles is committed to proposing shared, low-carbon waterborne mobility solutions.

The mobility sector, which accounts for more than a third of worldwide emissions, is currently shifting towards more responsible solutions. Transforming mobility on land, water and in the air is a major environmental challenge, if we want a world that is fit to live in. We are supporting the energy transition in our sector by offering a new cleaner and more energy-efficient type of watercraft that uses foils and hydrogen.

VIRGINIE SEURAT
GENERAL MANAGER
OF SEABUBBLES



SEABUBBLES



The exclusive X-Pearl edition, inspired by the pearling tradition in the United Arab Emirates

As an integrator of complex systems, SeaBubbles develops technological solutions for accessible urban mobility that leverage large, ancestral waterway infrastructures.

To achieve this, SeaBubbles relies on a multidisciplinary team with complementary expertise. Its members share a common passion for innovation and a strong commitment to environmental issues. Together, they are working to create a new, never-before-seen type of watercraft.

Uses of the SeaBubble

The SeaBubble is designed for frequent use on routes defined by ship-owners: mobility operators, local authorities and smart cities, stakeholders in the hotel and tourism sector, and companies that are aiming for sustainable, net-zero mobility.

Pilot routes are being set up to test infrastructure for the deployment of hydrogen and hydrofoil technologies in our regions.

The SeaBubble is designed to operate on both salt and fresh waterways. Its underside can operate in sea conditions with winds of up to Force 5. The use of foils is recommended in calm weather, with maximum Force 4 wind speeds.

Foils are ideal for sailing on lakes or rivers or in sheltered bays. Lake Geneva, Dubai Harbour, Sydney Bay, San Francisco Bay and the Thames are all examples and offer possibilities for the adoption of this new, clean and futuristic transport mode.

ARIANE NICOT-BÉRENGER
MARKETING & COMMUNICATION
MANAGER

I discovered SeaBubbles in London this year. I can see the application for the River Thames working well and an important technology that can scale and be useful for commercial use in London.

This reduces congestion on our roads and is a sustainable approach to transport in any city that is rapid, clean and doesn't create waves that can damage river banks. Zero noise is a vital element for night time movements especially as our urban dwellings are on the river sides and being zero emission is a vital step for any city. SeaBubbles has an important future in our smart city and this innovation is important and part of the solution.

FREDDIE TALBERG
CEO OF EMSOL (UK),
AIR QUALITY CONSULTING FIRM

0 WAVE
NOISE
EMISSION

A COMBINATION OF HYDROGEN AND FOILS TO OPTIMISE THE USE OF ENERGY

A key part of the green transition

The hydrogen

In the context of global warming, the energy transition has become a priority and countless public initiatives have been taken to support it.

The worldwide deployment of the hydrogen option is growing faster than ever. In early 2021, over 30 countries released hydrogen roadmaps and more than 200 large-scale projects were announced. This large number of projects in the pipeline all over the world may considerably reduce the amount of carbon generated, thus significantly helping achieve global climate targets. If these projects come to fruition, total hydrogen investments will exceed USD 300 billion by 2030, i.e. the equivalent of 1.4% of global energy funding.

SeaBubbles paints a beautiful picture of what the future of marine transportation could look like. Their inspired vision takes us to a place where we can imagine mobility with minimal impact to the environment.

SeaBubbles has harnessed the power of technology to respect and protect the fragile ecosystems that sustain us. The future of our planet depends on this kind of innovation. Life is movement, and to move in harmony with nature is the ultimate achievement.

SASHE ANNETT
FOUNDER OF H2 VISION (USA)



SEABUBBLES



Only minimally in contact with water, the foils generate little drag and reduce the SeaBubble's use of on-board energy.

In France, the France 2030 recovery plan is included in the French Energy Transition for Green Growth Act. It aims to increase the share of renewable energy to at least a third of final energy use by 2030.

Because it brings undeniable advantages in terms of low-carbon energy production and energy sovereignty, the hydrogen option has been identified as a priority in transition plans.

SeaBubbles fits in perfectly with initiatives designed to develop renewable energy use and reduce greenhouse gas emissions, pollutants and fossil energy consumption, by using hydrogen as the sole fuel.

An alternative fuel for the future, low-carbon hydrogen is converted by fuel cells into clean energy. Advances in electrolysis technology are enabling hydrogen to be produced economically and with a low carbon footprint before it is stored for use. Hydrogen is therefore a promising option for the energy transition and the future as it promotes the development of locally-produced renewable energies.

Dihydrogen reacts with oxygen in the air to produce a chemical reaction that generates electricity on the one hand and water on the other!

The foils

Flight stability is ensured by the Flight Control System, a piece of software developed specifically by SeaBubbles' engineers, which controls the flaps on the foils, via an inertial measurement unit, in real time. This system from the field of aeronautics provides control of the boat's trim, while reducing the rolling, pitching and yaw forces.

Whereas the foils used reduce the consumption of on-board energy by 35%, hydrogen supplies seven to nine times more energy than a traditional generator. This synergy ensures a high level of autonomy with only a few minutes of refilling time, while emitting only water.

The combination of a battery pack and a fuel cell accompanies variations in power requirements and thus evens out the response time inherent in the fuel cell's increase in power.

Indeed, the chemical reaction in the fuel cell creates 'low' but long-lasting power, while the battery releases electrons in metal, resulting in high but short-lived power.

As soon as the issue of available recharging infrastructure is addressed, a few minutes of refilling can replace several hours of recharging batteries.



Foil technology, based on technological breakthroughs in the field of yacht racing, is currently being deployed in shipbuilding for proximity solutions. Foils sharply reduce the wetted surface and the water mass displaced during operation. Freed of much of its adherence to the water, the boat skims along at high speed, saving a considerable amount of on-board energy and avoiding the creation of wake waves that speed up shoreline erosion.

LOÏC DEBISSCHOP
FLIGHT CONTROL MANAGER



NEWS AND NEXT STEPS

- 1 The first SeaBubbles are in production** in the company's workshops in Saint-Jorioz, on the banks of Lake Annecy in Haute-Savoie.
- 2 Pilot routes will be set up** in 2023 on Alpine lakes as part of the mobility plans of partner municipalities.
- The battery-powered, **4 to 5 seats, SeaBubble** is available for sale. The new **8 to 12-seater SeaBubble** completes the range with a hydrogen fuel cell and soon an electric version. It will be previewed at the 2022 edition of the Cannes Yachting Festival.
- The company continues to **grow abroad** with the support of an ecosystem of local, European and international partners.
- The company is in the process of setting up the **SeaBubbles Academy**, an internal training and control centre also dedicated to the customer experience.



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