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The vessel now called the PORRIMA was the first vessel to circumnavigate the world using only solar power. Since a major refit in 2017, the 36-metre catamaran has been powered by integrating the use of solar power with hydrogen production from seawater on board. To this was added the pioneering technology of intelligent kites. During her second tour around the world, the vessel took a long break in Japan. Here she was renamed the PORRIMA – after the goddess of prophecy and the protector of pregnant women in Roman mythology. The principal of this initiative has dedicated his life to creating a renaissance – bringing the best of technology together with the best of Nature.

Now called the PORRIMA, she left Osaka, Japan, on 18th December 2021, to complete her second voyage and to prepare for a complete refit. This will include the integration of a variety of breakthrough technologies that will change our reality for good. Her first stops in the Gulf of Arabia and the Red Sea include Dubai, Abu Dhabi, Bahrain and the Kingdom of Saudi Arabia. From here, she will continue to the Mediterranean, with stops in Italy, France, Tunisia, and Spain, before spending nine months in Kenitra, Morocco. Here, a dedicated shipyard will turn the PORRIMA into living proof of the innovative technologies mentioned. Kenitra will also host the Blue Campus, where students will learn about technologies and business models that are not taught at universities or studied by engineering companies. We plan to prepare 500 young people for exceptional careers in this field.

The newly outfitted PORRIMA will undertake her maiden voyage to Dakar (Senegal), after which she will sail the Mediterranean, delivering portfolios of technologies and business models to cities and regions keen on spearheading change. We will measure our success by the actions taken after we leave port. The PORRIMA will cross the Atlantic, visiting the Amazon River before sailing along the Pacific Coast to San Francisco, and from there to Osaka, to arrive in time for the opening of World Expo 2025, delivering proof of the transformation possible – towards a sustainable society, one full of challenges and opportunities.



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THE PLASTICS PROBLEM

Plastics are now everywhere to be found, from the deepest part of the ocean, the Mariana Trench to the placenta of an expectant mother. Plastic pollution is changing life on Earth, as we know it. The first report on microplastics polluting the oceans was published in Nature Magazine, in 1972. In over half a century, we have done nothing about this but complain. The time has come to go beyond advocacy and take action. Some laudable initiatives have been undertaken to remove plastics from the ocean surface and from beaches but we need to see tangible results. We need to undo our past mistakes. As innovators, we know that this is only viable if a competitive business model exists.

ISOLATE, CONCENTRATE AND DESTROY MICRO AND NANOPLASTICS

The hard fact is that we seem to not have any control over dispersal of plastics. We can, however, address this problem by making use of technology inspired by the way our lungs employ micro fluid technology to remove CO2 – and nothing else – from our blood. We have designed technology that isolates and concentrates nanoplastics only from ocean water. The first-ever such installation will be operational on the PORRIMA by March of 2023. It will have a capacity that matches that of our lungs' ability to remove carbon dioxide from our blood, and we expect to process 1,000 litres of seawater per second, or 86,400 tons per day. Our vision is to visit ports around the Mediterranean and install 1,000 such units to embark on a large-scale cleaning campaign. We will then visit ports along the Atlantic and Pacific Coasts to share information on the business model that drives this revolutionary method. Cleaning up our oceans is long overdue, and we now have the technology to do this.

BLUE CAMPUS

Building the Talent of "Astronauts of the Sea" and Entrepreneurs for the Commons

We have learnt two lessons: The roll out of innovations requires the building of talent and it requires the power to industrialise. Our goal is to initiate 500 people from all over the world, who are young (in age or at heart) and dedicated, into the innovations and business models that will transform the world, especially for those living and earning a livelihood along coasts.

During the refit of the PORRIMA in the dry dock in Morocco, we will disseminate knowledge on all the pioneering technologies by way of workshops. Here, students will be able to learn about technologies that have proven their value. During the workshops, students will receive information on cutting-edge improvements to the innovations, learning to envision, design, install, operate, maintain and repair such installations. We will build talent in operating intelligent kites, producing hydrogen from seawater, removing plastics from the ocean floor, fishing with bubble curtains... and more. Each of the 500 eager change agents will earn the title "Astronaut of the Sea" for their will and perseverance in building a business of their own and supporting industrial initiatives to fast track the roll out of innovations that will change the reality for people, communities and Nature.



MAKING FISHING SUSTAINABLE AND ENERGY-WISE

The fishing industry has been, and still is, overfishing, depleting fish stock, around the world.

A team of experts, operating as BlueShipYards (Morocco), has designed 20-24 metre-long fishing boats that use a mixture of solar, hydrogen and kite power for propulsion. These systems have been proven by the PORRIMA. These boats will also be the first in history to deploy the air bubble curtain fishing technique. By releasing curtains of air bubbles fish are trapped in a way that allows for the selective catching of male fish only. The catch is processed on-board, in a way that generates ten times more revenue. This allows for the fleet to operate in a competitive manner, with zero waste and zero emissions. The selective fishing method allows female fish to continue brooding. Our vision is to share this fishing model with coastal communities, in combination with cleaning up plastics, as a way to earn a livelihood.

BLUE AMMONIA

Ammonia is one of the most polluting, yet indispensable, chemical feedstocks in history

There is a quest for finding a green form of ammonia, and the knowledge gained on the PORRIMA enables us to offer the ultimate – a blue form of ammonia. The technology consists of power generation using intelligent sails, ones that capture energy from altitudes of 200-800 metres. Power is generated by the up-and-down motion (the yo-yo effect) of the kite. The power generated is used for the production of hydrogen onsite. A battery of 1,000 kites can, for instance, generate one GW of power on defunct mining sites, within a space of only 800 hectares. This translates into the availability of 'zero kilometre hydrogen' (produced and consumed in the same place). The hydrogen is manufactured by way of a novel chemical-physical process, eliminating the need for desalination, demineralisation, and deionisation. The reaction produces hydrogen at 350 bar, eliminating the need for compressors. When this hydrogen is converted onsite to generate ammonia, this blue Ammonia outcompetes and outperforms all other options on price and sustainability.

OFFERING COASTAL COMMUNITIES A LIVELIHOOD

If you have sun, sea and wind...

The PORRIMA has proven that a small community, one that doesn't have anything else available except the sun, seawater and wind, can make a living. Solar power offers a backup. The intelligent kite offers base load energy 24 hours a day, and operates without batteries since all excess energy is converted into hydrogen onsite. Only using excess power, this combination produces drinking water as a by-product, at a fraction of the cost of reverse osmosis. This shift away from water and power shortages offers local communities the opportunity to pursue development, including farming, ecosystem restoration and regeneration of fishing grounds, with sustainable tourism at the core of it all.





ECONOMICS OF THE UNDERWATER WORLD

We have sent a hundred times more rockets into Space than probes into the deep ocean.

A portfolio of Blue Innovations will render the discovery of the seas a more secure, a more enjoyable, and an economically more viable undertaking. This portfolio includes, **firstly**, full-face diving masks that allow divers to talk to each other by way of the transmission of data through light. **Secondly**, underwater weather forecasting that allows for the monitoring of the weather with extreme precision, in localised areas. **Thirdly**, a full 3-D vision system that will map the ocean. We can measure the exact height of Mount Everest but do not have instrumentation to determine the precise depth of sea trenches. Currently, only about 20% of the sea floor has been mapped with 2-D cartography. This novel technology will allow for every corner of the ocean to be photographed in 3-D. **Fourthly**, this technology will utilise water density, which offers an almost thousand-fold improvement in sound transmission. Ultra-efficient sound filtration gives us the ability to monitor any activity in the ocean. By using a unique frequency we can zero in on a specific sound, be it the heart beat of a fish, allowing us to estimate its size and weight, and even its gender and age.

THE BLUE OCEAN PAVILION

The World Expo 2025 will be held in Osaka.

Japan. The ZERI Japan NPO will celebrate its 30th anniversary with The Blue Pavilion, in one of the nine central halls of the Expo. The ZERI Japan NPO was established after the work in preparation of the Kyoto Protocol was finalised. This work was done in collaboration with the United Nations University, and has, since 1996, stood at the core of all these activities. The Pavilion, designed by Mr Shigeru Ban, will deliver proof of all the Blue Innovation solutions mentioned above. At its centre, will be the concrete experiences the sea vessel PORRIMA has gained during her Blue Odyssey. The Blue Pavilion will mark the full industrialisation of the solutions offered, and of the emergence of a new form of entrepreneurship – all for the common good.



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The PORRIMA logo designed by Michelangelo Pistoletto, using the 100 icons that symbolise the Blue Economy, an economic development model created and documented by Prof. Gunter Pauli (Dr. h.c. Mult)

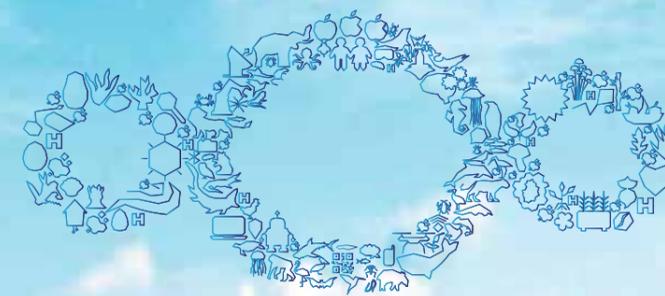
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PORRIMA

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