Genevos
EFFICIENT INNOVATIONS

HYDROGEN POWER SOLUTIONS

ENABLING ZERO EMISSION VESSELS

About Genevos

Marine hydrogen power solutions

MISSION

Pioneering plug & play marine hydrogen power solutions to enable clean and resilient mobility on our oceans.

HERITAGE

Genevos was founded in 2018 as a spin-off company from 'OceansLab – Cleantech Accelerator', a record-breaking zero-emission offshore sailing project that innovates and demonstrates low-carbon technologies in the maritime sector.

ACTIVITY

Genevos engineers, certifies and produces plug-and-play Hydrogen Power Modules (HPM) offering scalable power solutions up to multi-MW scale.

Genevos goes further to support the energy transition for clients through the provision of engineering services and energy optimisation through an advanced power management system.

Hydrogen Power Module ‘HPM’

The plug & play power solution for marine

Decarbonising vessels through auxiliary, primary or hybrid integration

This scalable solution can be applied across the maritime sector from small to large vessels including yachts, ferries, service vessels, inland transport and shipping.

FEATURES

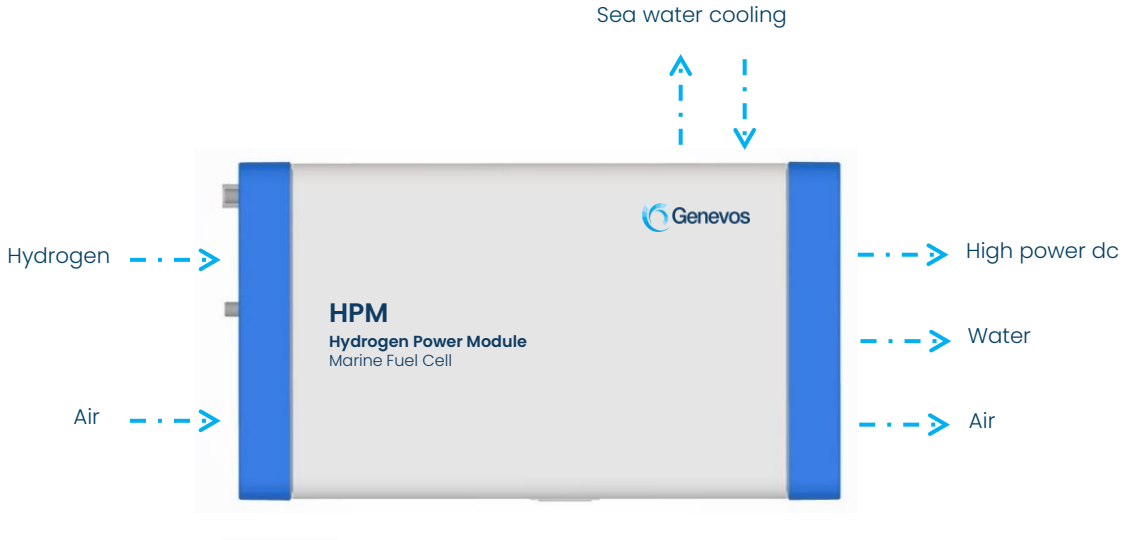
- **Zero emissions** no vibration and low noise
- **Practical** compact and low weight
- **Stackable** to high power
- **Modular** enabling high redundancy
- **Marinised** protection against humidity & salinity
- **Durable** resistant graphite plate technology
- **Certified** for use on commercial vessels
- **Plug & play** fully integrated balance of plant
- **Efficiency** through adaptive power management

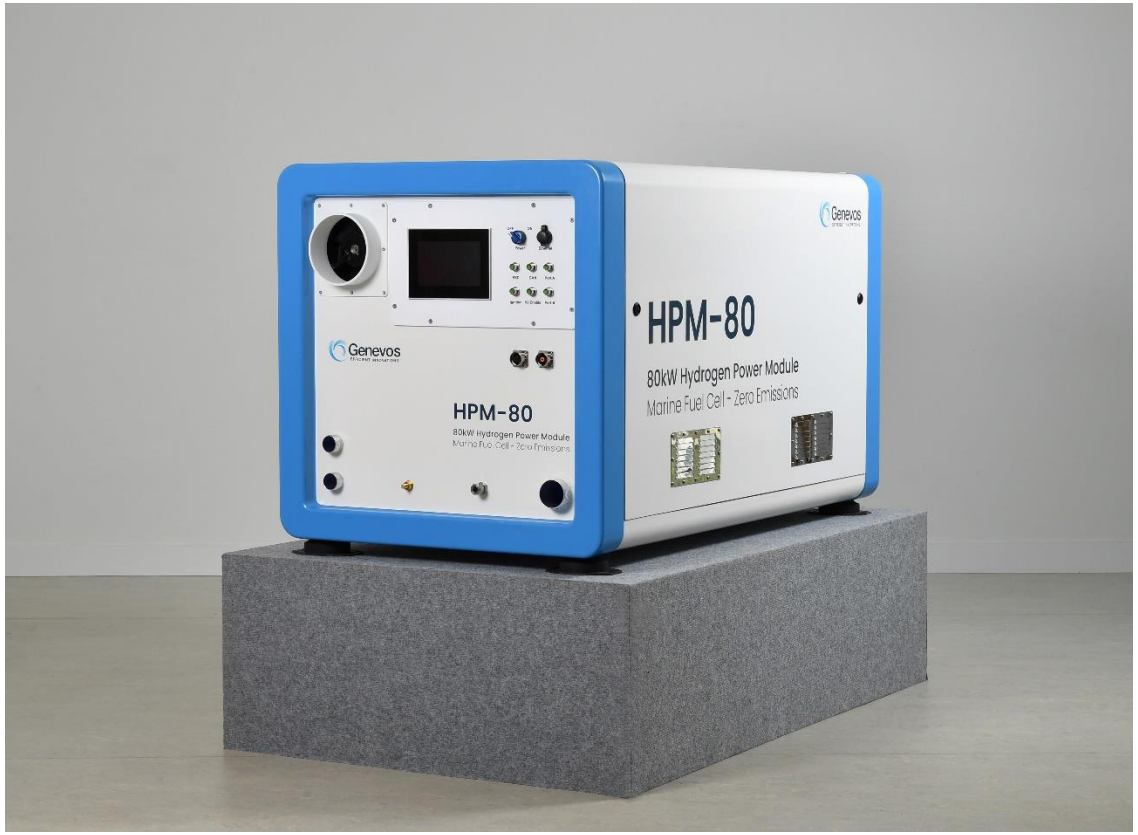
Drop-in Fuel Cell Solution

Genevos' plug & play marine power solution

COMPONENTS/SYSTEMS INTEGRATED

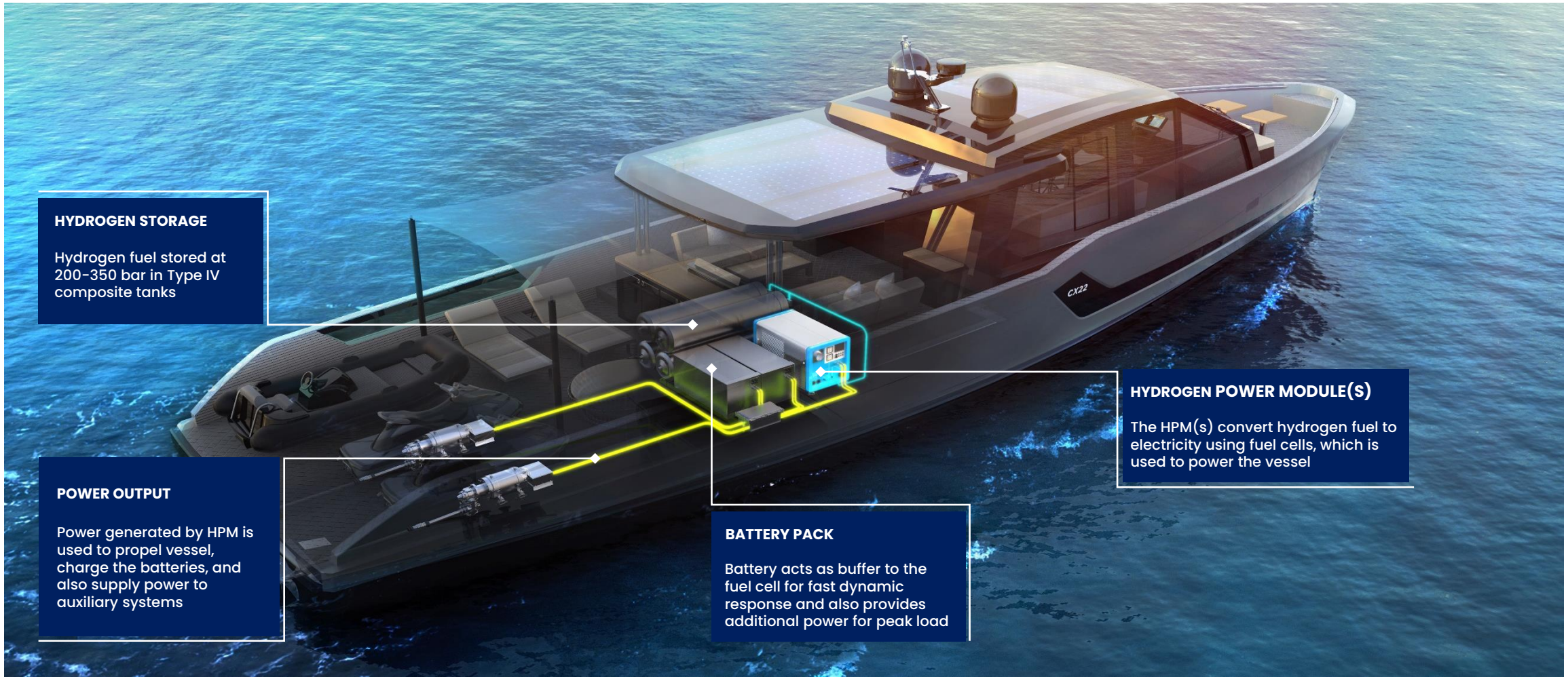
- Hydrogenics graphite PEM fuel cell stack
- Air filtration and compression
- Cooling system with heat exchanger
- DC-DC converter
- Energy Management System
- Safety monitoring system
- User interface & data logger





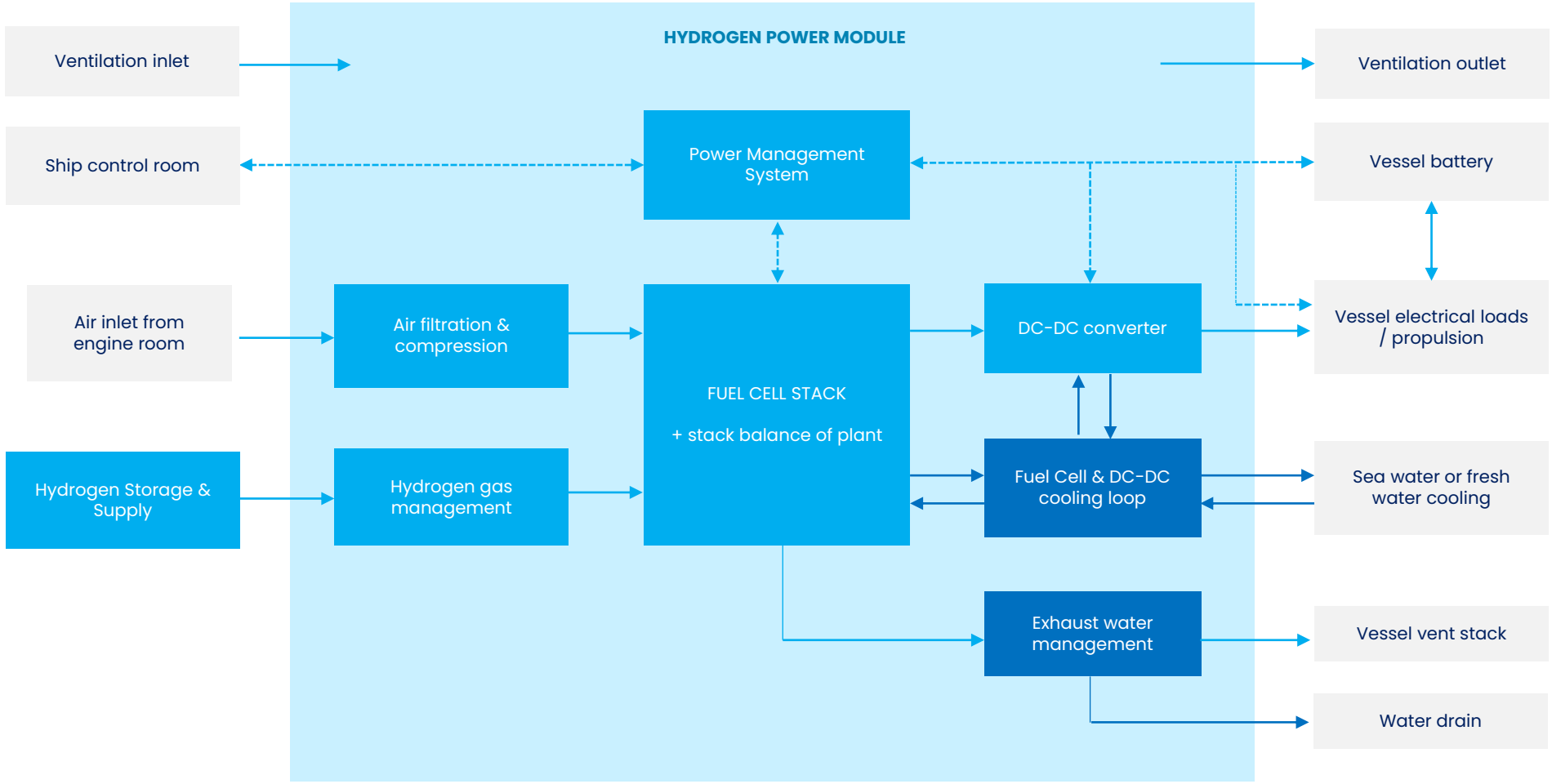
Hydrogen-Electric System

Providing a low weight, zero emission propulsion solution for vessels



HPM – Scope of Supply

The complete "H2-Pack"



Scalable Power Solutions

Modularity to enable power systems tailored specifically to vessel

HPM FAMILY

Genevos offers power modules from 40 kW to 80 kW to meet exact power requirements of a wide range of vessels.

80 kW modules can be stacked to provide power solutions up to MW scale.

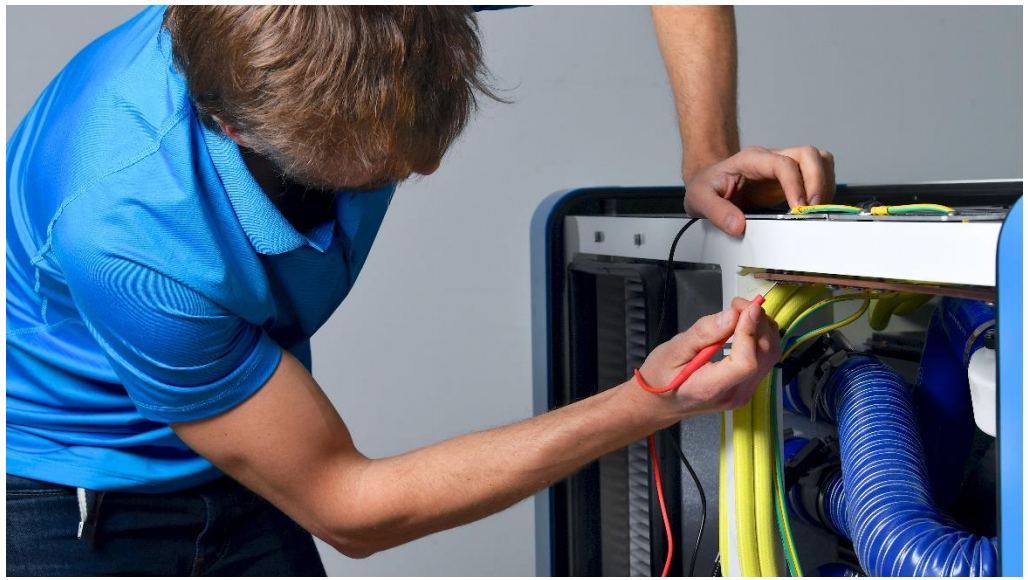
HIGH POWER SYSTEMS

- Fully-integrated, independent modules for high redundancy
- Optimised durability – through advanced system control
- Optimised fuel cell efficiency - through advanced system control

HPM Technical Specifications

A compact and low weight solution designed for vessels

TECHNICAL DATA	HPM-40	HPM-80
Continuous Peak Power (BOL)	40 kW	80 kW
Rated Power (EOL)	35 kW	70 kW
Output Voltage (Controllable)	250 - 900 V_{dc}	400 - 900 V_{dc}
Weight	200 kg	330 kg
Peak Efficiency	54 %	54 %
Dimensions (L x W x H)	140 x 80 x 50 cm	140 x 80 x 80 cm
Communication	CAN bus	
FC Stack Estimated Lifetime	> 20,000 hrs	
Fuel	Gaseous Hydrogen ISO14687-2	
Ambient Air Temperature Operation	-25 to 45°C	
Environmental Rating	IP54 - IP56	

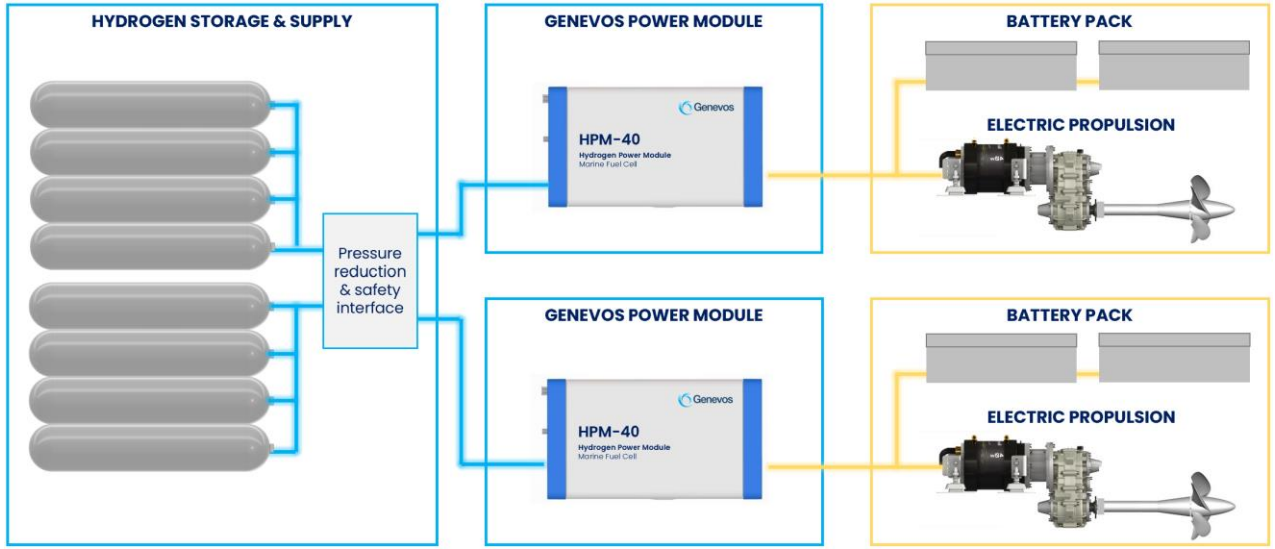


Low Power Applications

Water taxis and pleasure craft: 40 kW - 80 kW vessels

HPM-40

LOW POWER SYSTEM

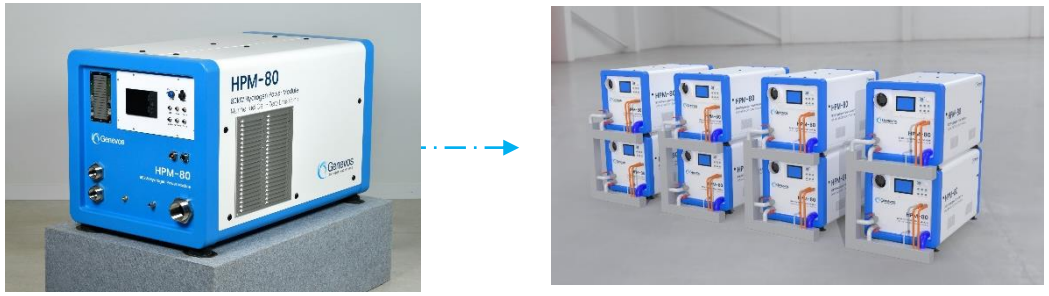


VESSEL EXAMPLES

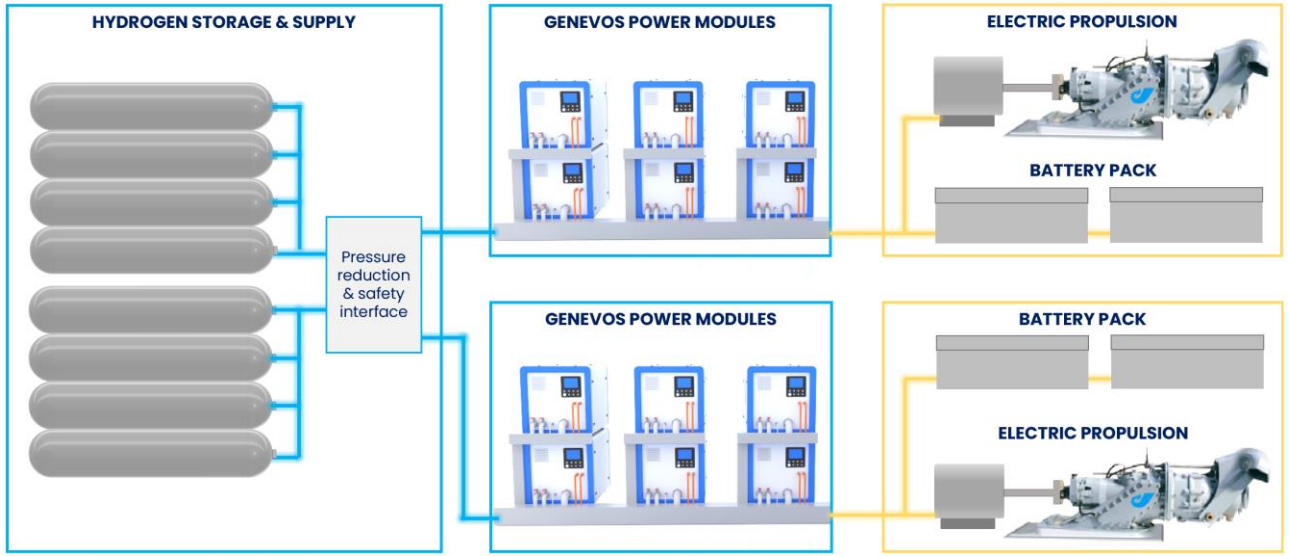
High Power Applications

Commercial marine applications: 80 kW – 1 MW vessels

HPM-80



HIGH POWER SYSTEM

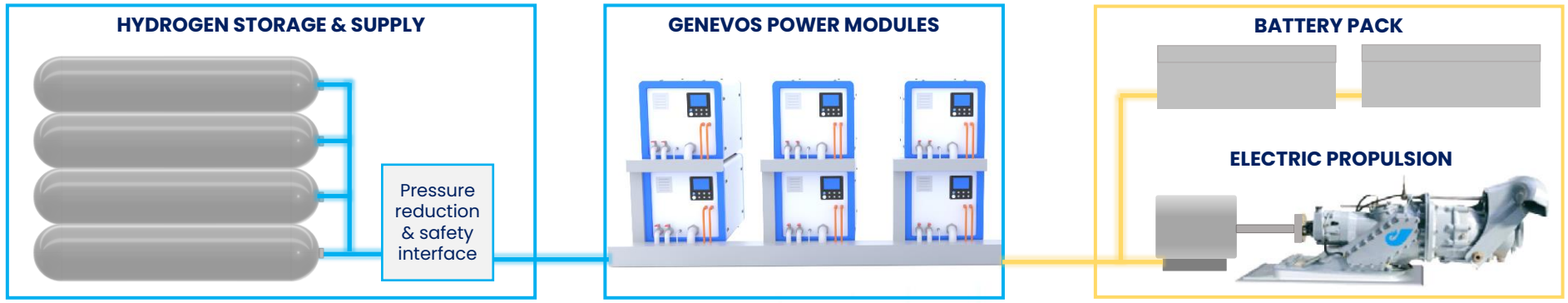


VESSEL EXAMPLES

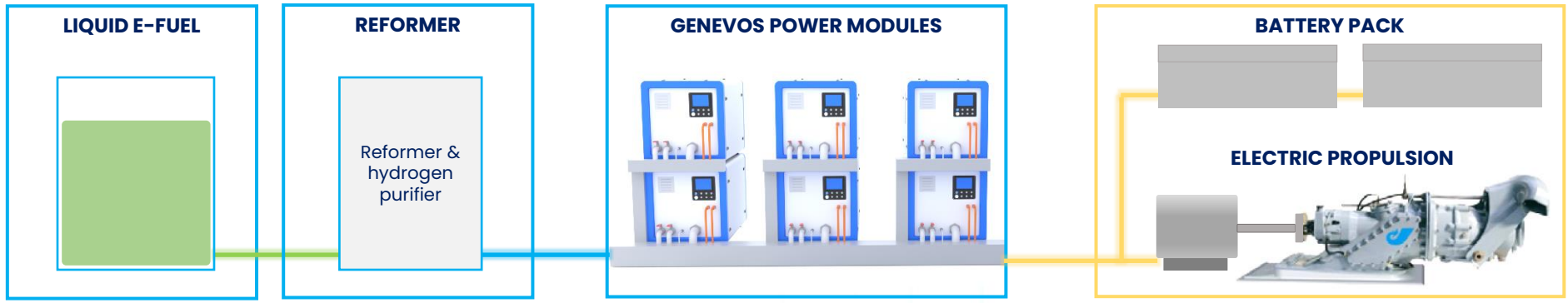
Compatibility with Future E-Fuels

Modularity enables compatibility with liquid e-fuels for future retrofits or new vessels

COMPRESSED HYDROGEN



HYDROGEN E-FUELS



FUELS

- Green hydrogen
- Blue hydrogen

FUTURE FUELS

- Methanol
- Liquid hydrogen
- LOHC
- Ammonia

HPM Benefits

Accelerating the clean power transition

ADVANCED

- Hydrogenics (Cummins) graphite stack technology, world-leaders in hydrogen fuel cells
- Marinised - resistant to saline environment

ENVIRONMENTAL

- Zero emissions: No CO_2, NO_x or SO_x
- No vibration, low noise
- High recyclability (>90%)

EFFICIENT

- Up to 55% net fuel efficiency - twice that of a diesel genset
- Advanced energy management optimising fuel efficiency
- 4 – 6 times lighter than batteries

PRACTICAL 'PLUG & PLAY'

- Rapid refuelling
- Low maintenance
- Modular - multiple units to attain required power
- Fully integrated system for practical installation

Technology Comparison

A scalable cost-effective zero-emissions solution for marine

Comparison of different powertrain technologies, based on a 30 kW marine propulsion system with a 12 hour range.

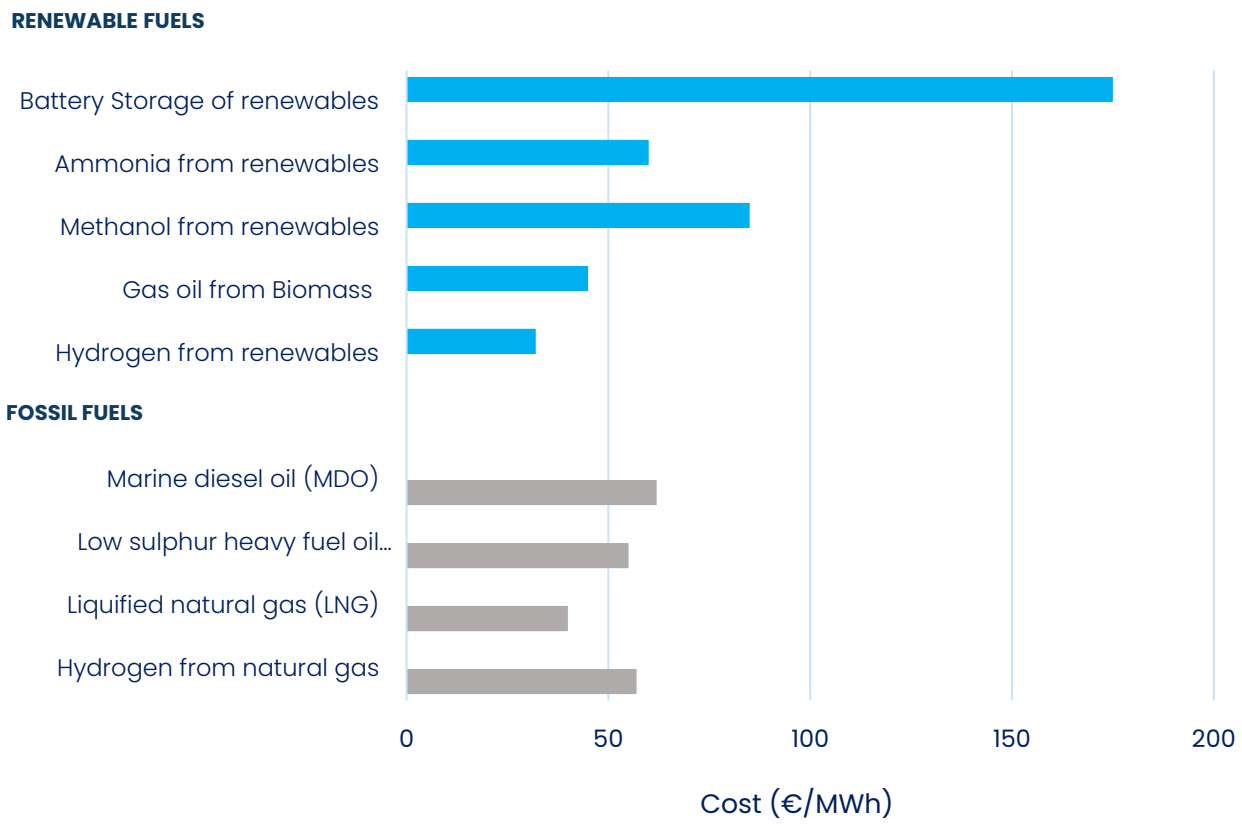
	LIFETIME (YRS.)	EFFICIENCY	REFUELLING TIME	WEIGHT (GENERATOR + FUEL)	EQUIPMENT COST	COST OF OWNERSHIP (5 YRS.)	TOTAL VOLUME
HYDROGEN	15 - 20		15 mins				
BATTERY	5 - 10		5 - 10 hrs				
DIESEL	15 - 20		15 mins				

The Genevos HPM is around 1/3 of the weight of a typical diesel generator

Hydrogen - A Vital Future Fuel for Marine

Incentivising global H2 infrastructure to access clean hydrogen

PROJECTED FUEL COSTS – 2030 ^



PROFITABLE

- Payback after 6 years with over 20% of savings after 10 years in operation relative to diesel system
- Cost of equipment is 50% less than all-lithium battery system for 20 hr system range

^ Source: Zero-Emission Vessels - Transition Pathways 2019

Engineering for Efficiency

System sizing, installation design, power management

Genevos offers engineering services for clients exploring and applying HPM solutions through the provision of in-house simulation tools and expertise in power management, control, and hydrogen.

Following installation of the HPM system, Genevos provides support services for efficiency and performance optimisation, along with an annual service package.

SERVICES OFFERED – THE COMPLETE PACK

Offsite

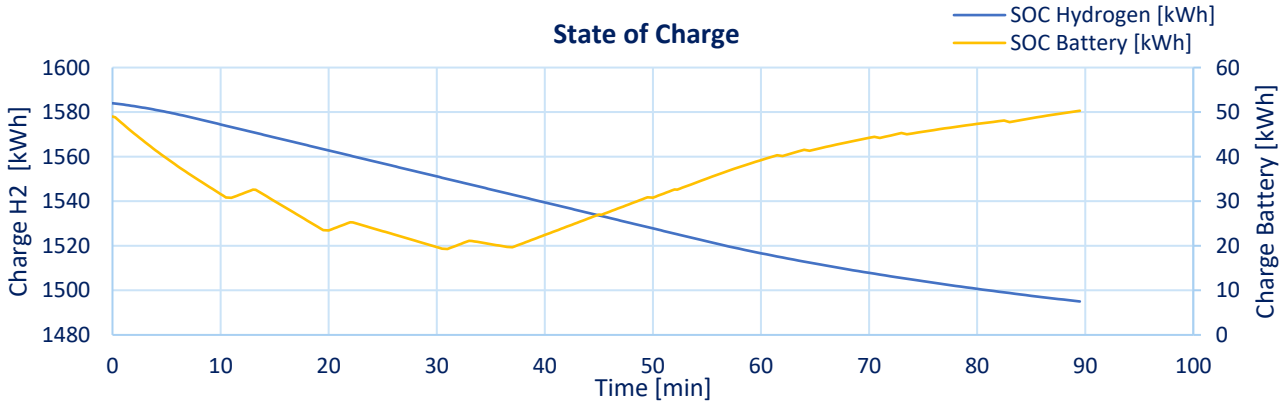
- Preliminary sizing studies based on vessel operational profile
- Hydrogen system integration design
- Safety & risk assessment

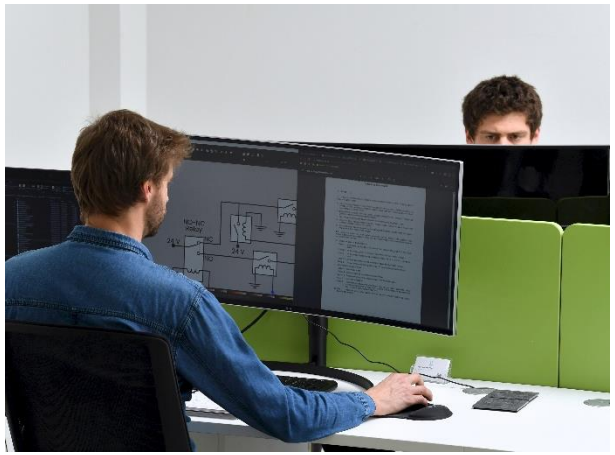
Onsite

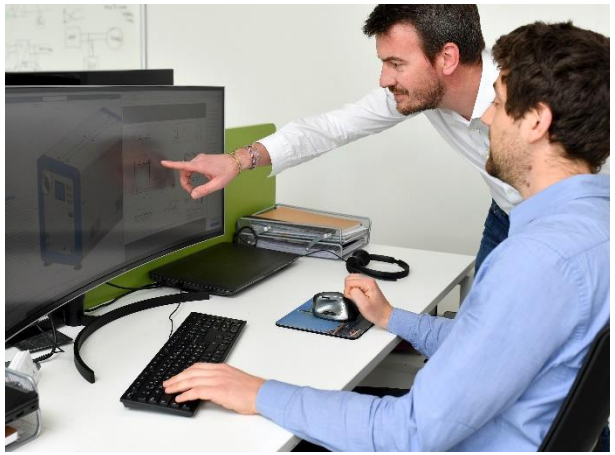
- Commissioning support
- System installation

After-Sales

- Cloud connectivity & remote monitoring
- Power Management System (PMS) upgrades and performance optimisation
- Annual Service Package





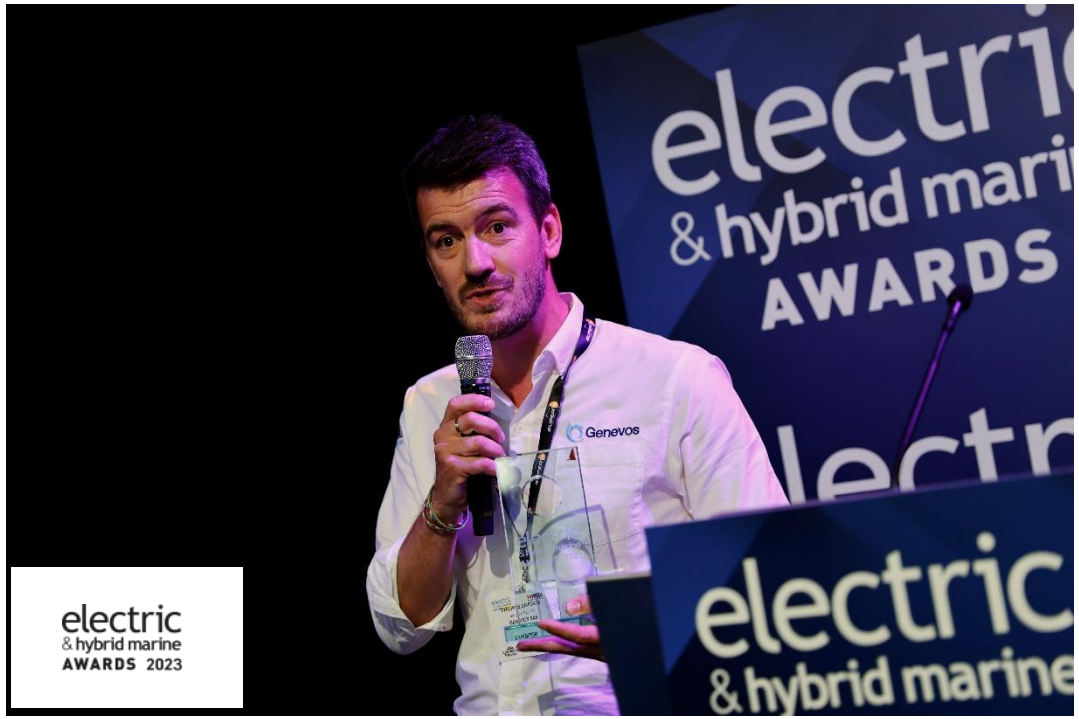


Recent Awards

Accelerating the clean hydrogen transition

Genevos' award-winning and drop-in marine fuel cell revolutionises maritime power by offering an environmentally friendly solution with high scalability and redundancy.

Hydrogen Breakthrough of the Year Award



Monaco Price for Innovation in Hydrogen & Transportation

Partners & Associations

Collaborating for the clean transition

Genevos
EFFICIENT INNOVATIONS

GREEN HYDROGEN

Pôle Atlan Tech La Rochelle
Lhyfe

CERTIFICATION

LR
Bureau Veritas

PROJECT

Région Nouvelle-Aquitaine
bpifrance

NETWORKS

European Clean Hydrogen Alliance
Race to Zero
Atlantic Cluster
SME Climate Hub
Cluster Maritime Français — Cap sur la croissance bleue
Scottish Hydrogen & Fuel Cell Association
France Hydrogène — Engagée pour la transition écologique
AFBE — Association Française pour le Bateau Electrique

R&D

Imperial College London
EIGSI École d'Ingénieurs La Rochelle · Casablanca

AWARDS

electric & hybrid marine AWARDS 2023
electric & hybrid marine AWARDS 2022
Monaco Hydrogen Alliance
Solar Impulse Efficient Solution Label
Innovation Nautisme Sud Ouest

Contact Us

Find out more about how to decarbonise your vessel or fleet

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Innovating zero emission power solutions to enable clean and resilient mobility on our oceans

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