

PowerCell Marine System 225 (green hydrogen)

PowerCell

The climate solution

PowerCell developed a Marine System 225, which substitutes conventional ICE marine power systems and operates using hydrogen as fuel. When powered with green hydrogen, the fuel cell can deliver significant reductions in life cycle emissions as compared to conventional power systems.

Green hydrogen is produced by splitting water with renewable electricity using electrolysis.



Climate benefits

Lifecycle assessment shows that the PowerCell Marine System 225 (green hydrogen) significantly outperforms the current market:

82% lower carbon footprint for the MS225 using green hydrogen fuel cells on a cruise ship

81% lower carbon footprint for the MS225 using green hydrogen fuel cells on a bulk carrier

Why green hydrogen-powered marine fuel systems matter

Green hydrogen-powered marine fuel systems help accelerate a more sustainable shipping industry by:

- Replacing fossil fuels with hydrogen produced from renewable electricity
- Delivering the same power performance as conventional marine fuels
- Reduce harmful local air pollution, including NOx, SOx, and particulate matter

Together, the advantages of using hydrogen fuel cells substantially reduce customers' climate footprints and support the sustainable shipping transition.



“We assessed the MS225 cradle-to-grave because that's the only honest way to talk about climate impact in shipping. The result – over 80% lower lifecycle emissions versus marine gas oil – means customers acting today aren't betting on future technology. They're deploying a solution that already meets a credible 1.5°C-aligned standard.”

**Victor Åkerlund, Chief Analytics & Sustainability Officer
PowerCell Group**

PowerCell Marine System 225 (green hydrogen)

PowerCell

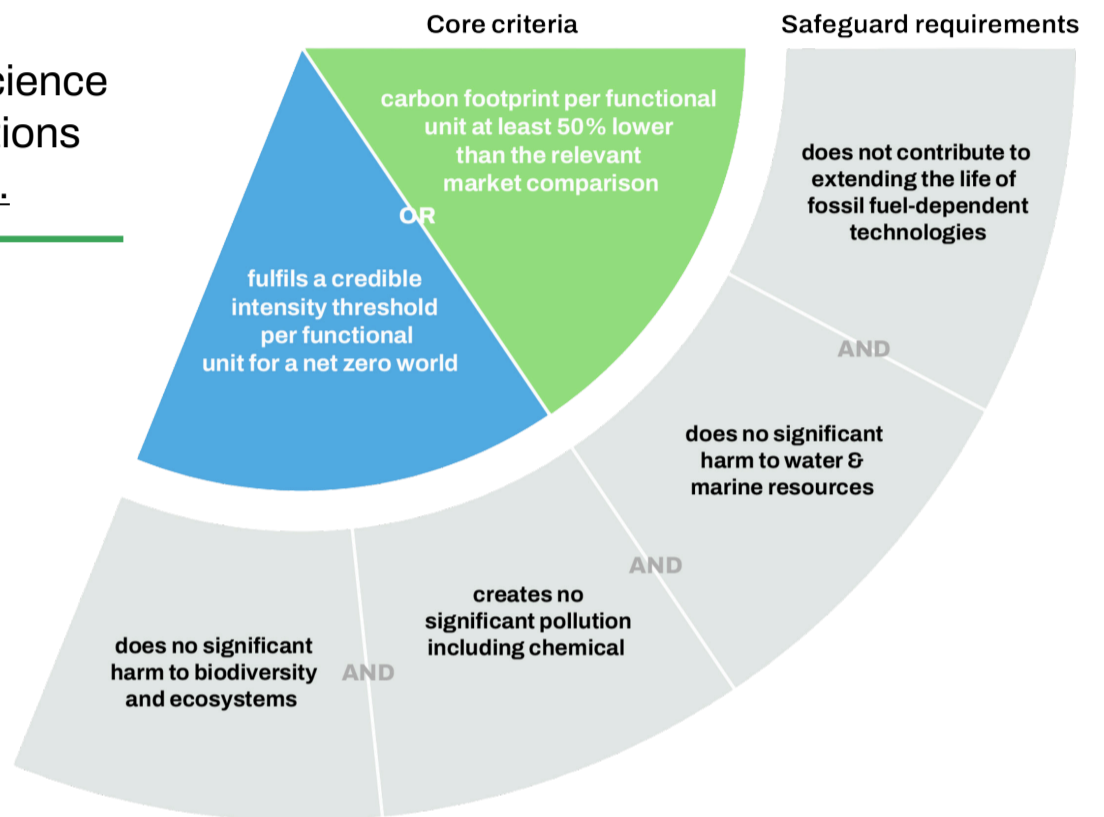
The Climate Solutions Framework

The Climate Solutions Framework (CSF) was developed by the Exponential Roadmap Initiative in collaboration with Oxford Net Zero and experts from business, NGOs, and finance to guide financial institutions and corporations in making informed decisions leading to significant emission reductions while avoiding greenwashing.

This framework sets out criteria anchored in science for defining climate solutions and climate solutions companies. [More information is available here.](#)

How does ERI define climate solutions?

A climate solution is a product or service with significantly lower emissions (more than 50%) than current market options. Its production and consumption align with the global 1.5°C ambition, and its adoption accelerates progress toward a net zero economy.



Market comparison

The marine industry is one of the biggest emitters in the world due to its reliance on fossil fuels. The hydrogen-powered fuel cells allow to reduce the lifecycle emissions of marine power units given the green hydrogen production pathway.

The PowerCell MS225 qualifies as an ERI Climate Solution by delivering more than 50% lower emissions than the market average:

- Cruise ship auxiliary system powered with MGO: 0.152 vs. 0.802 kg CO₂e/kWh
- Bulk carrier propulsion and auxiliary system powered with MGO: 0.138 vs. 0.728 kg CO₂e/kWh

Category & units

- **Solution category:** Green Hydrogen for Transport
- **Functional unit:** 1 kWh of delivered energy
- **System boundary:** Cradle-to-grave

Safeguarding compliance

- **SC1:** Does not extend fossil-based technologies
- **SC2:** Complies with Swedish water protection legislation
- **SC3:** Handles hazardous waste responsibly
- **SC4:** Operates under ecological protection requirements