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## A Swappable Battery to Reduce Emissions of Ships.

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Waterborne transport emissions represent around 13% of the overall EU greenhouse gas emissions from the transport sector and the push for reducing carbon emissions is a top priority for the next decade in the shipping industry. The project 'Current Direct', funded by the EU Horizon 2020 initiative, contributes to the direction of decarbonisation and addresses the challenges by designing an innovative and optimised Lithium-Ion battery system. Current Direct aims to develop a containerised energy storage system which enables easy swapping operations to provide a zero-emission source of energy for vessels' propulsion and auxiliary power. The concept of having a module energy system introduces the need to have a commonly adopted standard interface irrespective of the ship and supporting shoreside infrastructure. Current Direct will be targeting inland waterway & short sea coastal shipping as the conventionally propelled or hybrid vessels in these sectors can easily benefit from battery energy storage systems. The cloud-based Energy as a Service platform developed under Current Direct will pave the way for a sustainable battery swapping business model ensuring the end-users have the clean energy needed, when they need it, at a competitive price comparable to today's fossil fuels. The platform will primarily tackle the optimal charging and discharging scheduling of the batteries, manage the battery supply planning of the vessels, manage the battery fleet deployment between the swapping stations, and incorporate recognized practices of revenue management, thus providing end-users and stakeholders with sustainable swapping services through the EaaS network. The standardisation of this innovative model for swappable energy is also being considered through the development of a unified certification methodology that covers to the containerised battery design, operation, routine verifications, and the ship's suitability for utilizing such a power source for main propulsion and essential onboard systems.

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