

NEW ENERGY STORAGE TECHNOLOGY: EU PROJECT V-ACCESS GATHERS 14 INDUSTRIAL AND UNIVERSITY PARTNERS FOR ZERO-EMISSION WATERBORNE TRANSPORT.

There are more than 60.000 commercial vessels in operation worldwide which accounts for almost 3% of global CO2 emission and it is widely recognised that substantial CO2 savings can be achieved by integrating some forms of electrifications with batteries charged by shore power.

In this frame, innovative energy storage technologies can significantly improve the performance of batteries for of zero-emission waterborne transport, extending batteries lifetime, increasing the overall efficiency, so reducing (R&D and) operational costs.

The EU project V-ACCESS (“Vessel Advanced Clustered and Coordinated Energy Storage Systems”) combines the efforts of 14 international partners aiming to integrate a superconductive magnetic storage systems and supercapacitors into an innovative DC shipboard power grid to control flexibly the power sharing between the different energy storage technologies.

May 29, 2023 - There are more than 60.000 commercial vessels in operation worldwide which accounts for almost 3% of global CO2 emission and it is widely recognised that substantial CO2 savings can be achieved by integrating some forms of electrifications with batteries charged by shore power (possibly from renewable power sources).

In this frame, innovative energy storage technologies can significantly improve the performance of batteries for of zero-emission waterborne transport, extending batteries lifetime, increasing the overall efficiency, so reducing (R&D and) operational costs.

The EU project V-ACCESS (“Vessel Advanced Clustered and Coordinated Energy Storage Systems”) combines the efforts of 14 international partners aiming to bring together expertise on supercapacitors, superconductive magnetic energy storage systems (SMES), design and control of shipboard power systems, power electronics, lifetime cycle analysis, and ship classification to increase the technology readiness level (TRL) of hybrid storage systems – i.e. combining a battery with either supercapacitors, SMES, or both.

The goal is to integrate a superconductive magnetic storage system and supercapacitors into an innovative DC shipboard microgrid to control flexibly the power sharing between the different energy storage technologies.



This project has received funding from the European Union’s Horizon Europe research and innovation programme under grant agreement No. 101096831.

V-ACCESS has secured funding by the European Union's Horizon Europe research and innovation programme for the duration of three years. "We're paving the way towards Net Zero Vessel focusing on innovative energy storage technology and onboard energy management", said project coordinator **Giorgio Sulligoi** from University Trieste in Italy.

"We are working together to integrate *supercapacitor and superconductor technologies on board of hybrid and electric vessels by the end of the decade. This European project will contribute substantially to the creation of synergies between the partners to progress towards the objective of decarbonising maritime transport*" said the scientific coordinator **Pietro Tricoli** from University of Birmingham in UK.

Ambitious research targets

The partners of the project have already met at the IEEE ESARS ITEC 2023 inside the Venice Arsenal for the project's kick-off meeting. Throughout this first get-together, participants planned the tasks and developments of the project in detail. The proposed technologies are analysed from the components levels, already tested, and validated at TRL3, and modelled into the vessel's power system, also using control hardware-in-the-loop simulators. Then, the single components will be assembled together and integrated into a realistic shipboard power system available at the facilities and the technological demonstrator D-EFEEF of the University of Trieste to reach TRL5. Business models and standardisation needs will be deeply analysed and measures to unlock existing barriers and will be promoted in parallel to the technical knowledge generated from the project to ensure further exploitation of the project results and the definition of the steps to upscale the design of the V-ACCESS system, paving the ground for a full-scale demonstrator to be developed after the end of this project and bringing the proposed technologies closer to market.

The ambitious target calls for intensive research in the years to come by the industrial partners Fincantieri, VARD Electro, Vard Design, Skeleton Technologies, ASG Superconductors, RINA Germany, RINA Hellas, and the research institutes and universities RSE, SINTEF Energy, SINTEF Ocean, University of Trieste, University of Genova, Politecnico of Milano and University of Birmingham.



This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No. 101096831.



This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No. 101096831.



V-ACCESS
Vessel Advanced Clustered and Coordinated Energy Storage Systems

VESSEL ADVANCED CLUSTERED AND COORDINATED ENERGY STORAGE SYSTEMS

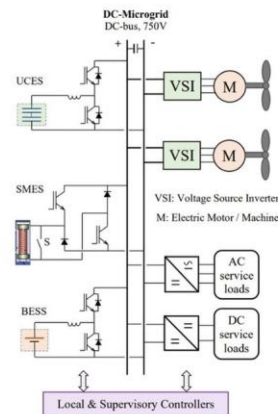
Funded by the European Union
Grant agreement ID 101096831

MARITIME EMISSIONS IN THE EU ACCOUNTS FOR 13% OF ALL TRANSPORT MODE.

A SUBSTANTIAL CO₂ SAVINGS CAN BE ACHIEVED BY INTEGRATING SOME FORMS OF ELECTRIFICATIONS WITH BATTERIES CHARGED BY SHORE POWER (POSSIBLY FROM RENEWABLE POWER SOURCES).

EFFICIENCY AND MITIGATION OF BATTERY DEGRADATION:

- ESS OPTIMIZATION
- INNOVATIVE DC POWER DISTRIBUTION



USE CASES AND SHIP DESIGN

Optimise the energy storage system(s) for specific use cases.
Define the impact on ship design and compliance with regulatory standards.



POWER DISTRIBUTION SYSTEM

Develop an innovative shipboard power distribution system with increased use of higher voltage DC networks to optimise the efficiency of innovative energy storage.



EFFICIENCY AND BATTERY LIFE

Demonstrate and validate the effectiveness of short-term energy storage devices for marine usage.

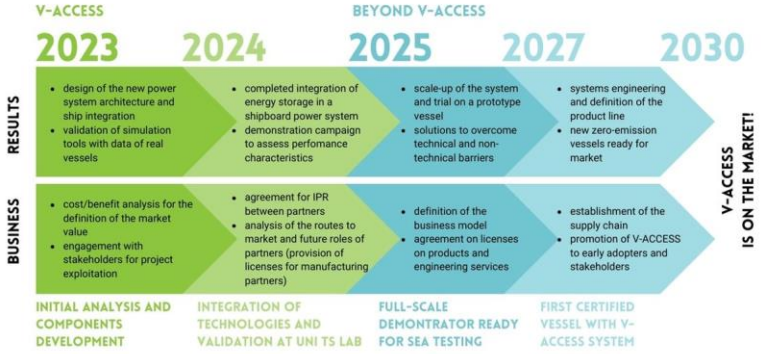
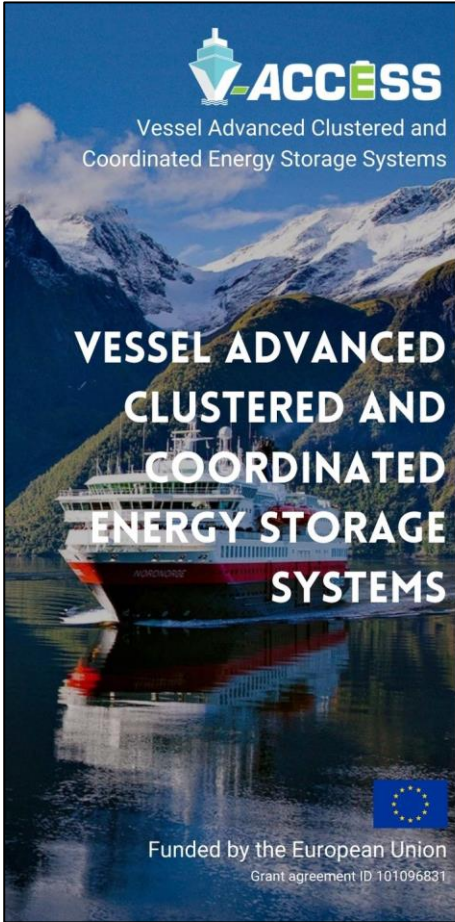


ENVIRONMENTAL IMPACT AND CARBON NEUTRALITY

Establish robust safety principles to mitigate hazards.
Prepare the ground for the subsequent demonstration at full-scale on a real vessel by 2027.



This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No. 101096831.



Superconductivity is a well-established technology solution where high magnetic field, or high current carrying capability is needed.

It already plays a fundamental role in many sectors: medical devices, HEP, Fusion energy, where it has been fully implemented, together with cryogenics.

SUPERCONDUCTIVITY CAN PLAY A ROLE ALSO IN MARINE ENVIRONMENT.



Discover more on the project website: <https://v-access.eu/>

Get in touch with the project team: v-access@units.it



This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No. 101096831.