

D7.1 EMS Architecture Design

by DUMAREY



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About DELYCIOUS

As Europe accelerates its transition to clean energy, the Net Zero Industry Act identifies low-carbon hydrogen production as a strategic priority. DELYCIOUS tackles key challenges in water electrolysis technology, focusing on extending electrolyser lifespans and reducing operational costs under variable renewable energy sources. In DELYCIOUS, the development of cost-efficient, innovative, open, universal, and safe diagnostic tools to investigate the chemical and electrochemical properties of electrolysis systems is foreseen. This project combines Raman Spectroscopy (Raman) and Electrochemical Impedance Spectroscopy (EIS), to explore the chemical and electrochemical properties of electrolysis systems. By using both physical and data-driven modelling, it will be possible to identify important degradation parameters. To ensure that the diagnostic tools work effectively in various temperature ranges and across various electrolysis technologies, three technologies namely Alkaline Electrolysis (AEL), Proton Exchange Membrane Electrolysis (PEMEL), and Solid Oxide Electrolysis (SOEL) are addressed in this project, with a demonstration on alkaline electrolysers beyond 100 KW.

Consortium



Coordinator



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DUMAREY

HORIBA

etaflorenc 

 stargate
hydrogen



Summary

Dumarey is responsible for analysing the system architecture and defining the Electrolyser Management System (EMS), which includes its implementation in terms of software and hardware integration. Dumarey will also procure the necessary components and develop a functional EMS prototype.

The EMS is designed to support system early-stage degradation diagnostics, enhancing the lifetime and performance of electrolyzers. It collects sensor data, transmits it to a remote server (cloud) for processing, and receives diagnostic outputs such as degradation levels, state of health (SOH), system warnings and failures. This information is displayed to operators, enabling them to perform optimal tuning and root-cause analysis of potential failures. The EMS will be deployed in the large-scale system.