



**CLEAN
HYPRO**

Open Innovation Test Bed for Electrolysis
Materials for Clean Hydrogen Production

CATALOGUE OF SERVICES

Preliminary Version



Co-funded by
the European Union

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TECHNICAL SERVICES

Service Name	Brief description of service	Technology, facilities and capability	Pilot lines involved
Manufacturing and testing of advanced AEL electrolyzers and their components	Manufacturing and testing of advanced AELs and their components	Equipment and facility for: the production of sintered (metallic catalysts substrate) electrodes for efficient AEL electrolyzers via the continuous coating strategy, enabling the fabrication of electrodes with long operating times, 100,000 h or more; the testing of electrochemical and mechanical properties. Capability for the development of AEL pressurised electrolyzers and refuelling stations technology.	PL1
Manufacturing and testing of advanced PEM electrolyzers and their components	Catalyst deposition for PEM based on: Spatial atomic layer deposition, and Additive manufacturing (3D printing) of nanostructured, porous metallic electrocatalyst Testing of PEM electrolyzers and components	Improved Spatial atomic layer deposition to deposit electrocatalyst layers (e.g., IrO₂) for PEM electrolyzers. Fabrication and depositing of porous electrocatalyst layer (e.g., IrO₂ and Pt) with large surface area so that the amount of required precious metal is lowered –	PL2, PL3, PL4

		spark ablation to deposit the material without any solvent. Automated test facility for the efficient testing of cells and short stacks under diverse conditions (e.g. temperature, pressure, flow rates)	
Manufacturing and testing of advanced AEM electrolyzers and their components	Manufacturing and testing of advanced AEM electrolyzers and their components	Equipment for and expertise in homogenous catalyst dispersion (both for cathode and anode) on polymeric membrane to form a single cell. Facility for their semi-automated manufacturing and testing. Facilities for the manufacturing and characterisation of single cell AEM – with a testing capability of 50 – 200 cm² cell; instrumentation for gas analysis to quantify H₂/O₂; expertise in ink formulation and screen printing on large surfaces (Target: 200 cm²). Target: (50–200 cm²) 5–10 cells.	PL5, PL6
Manufacturing and testing of advanced SOEC electrolyzers and their components	Fabrication of complete cells/stacks via additive manufacturing. Manufacturing of advanced electrode	Equipment and expertise for: the design and fabrication of electrolyte-supported free-shape solid oxide cells up to 20x20 cm² via	PL7, PL8

	nanomaterials innovative Testing of electrolyzers	for SOEC. SOEC	stereolithography (SLA) of ceramics substrates; and for the digital deposition of electrodes, coatings, and sealants. The fabrication of SOEC cells and stacks based on advanced electrode nanomaterials – controlling of the deposition and annealing processes of the nanomaterial. Testing facilities for SOEC technology: from cell up to whole systems; analysis of performance and degradation over long runs ca. 25000 h (ca. 3 years) – increased measurements capability to test both single-cell and short-stack integrated with automated data-analysis protocols.	
Feasibility Studies, LCA and LCC analysis	Evaluate the environmental and economic viability of your hydrogen innovation, supported by life cycle assessment (LCA) and life cycle cost (LCC) analysis to ensure sustainability and competitiveness.		Access expertise in Life Cycle analysis, Life Cycle costing, scenario modelling and benchmarking and decision support tools.	NA
Access to pilot facilities electrolysis	Test and validate your technologies in state-of-the-art pilot lines covering the full electrolysis value		Access to material synthesis and coating processes, cell and stack assembly lines, system integration and	NA

		chain, from materials to system integration.	testing, process optimisation and data acquisition, expert technical support	
Testing and certification of H ₂ systems		Obtain expert testing, validation, and certification services to verify performance, safety, and compliance with international standards.	Access to performance and durability testing, safety and reliability assessments, accelerated stress and ageing tests, standardisation and certification support, comprehensive test data reporting.	NA

NON-TECHNICAL SERVICES

Service Name	Brief description of service
Electrolyser certification and compliance	Definition and assessment of schemes of certification; definition of testing protocols to achieve e.g., CE marking and meet regulation requirements for commercialisation.
Communication and dissemination	Outreaching dissemination and communication activities
Networking, scouting and investor access	Networking and access to investors in the field of hydrogen, mobility, circular economy, sustainability and renewable energies
Innovation and commercialisation support	Networking and access to investors in the field of hydrogen, mobility, circular economy, sustainability and renewable energies.
Public-private financial advisory	Funding strategy development, guidance on EU and national funding schemes, investor readiness support, facilitation of connections with investors, industry partners and financial institutions, and advisory in leveraging public-private synergies.

