

FUNDACIÓN CIRCE



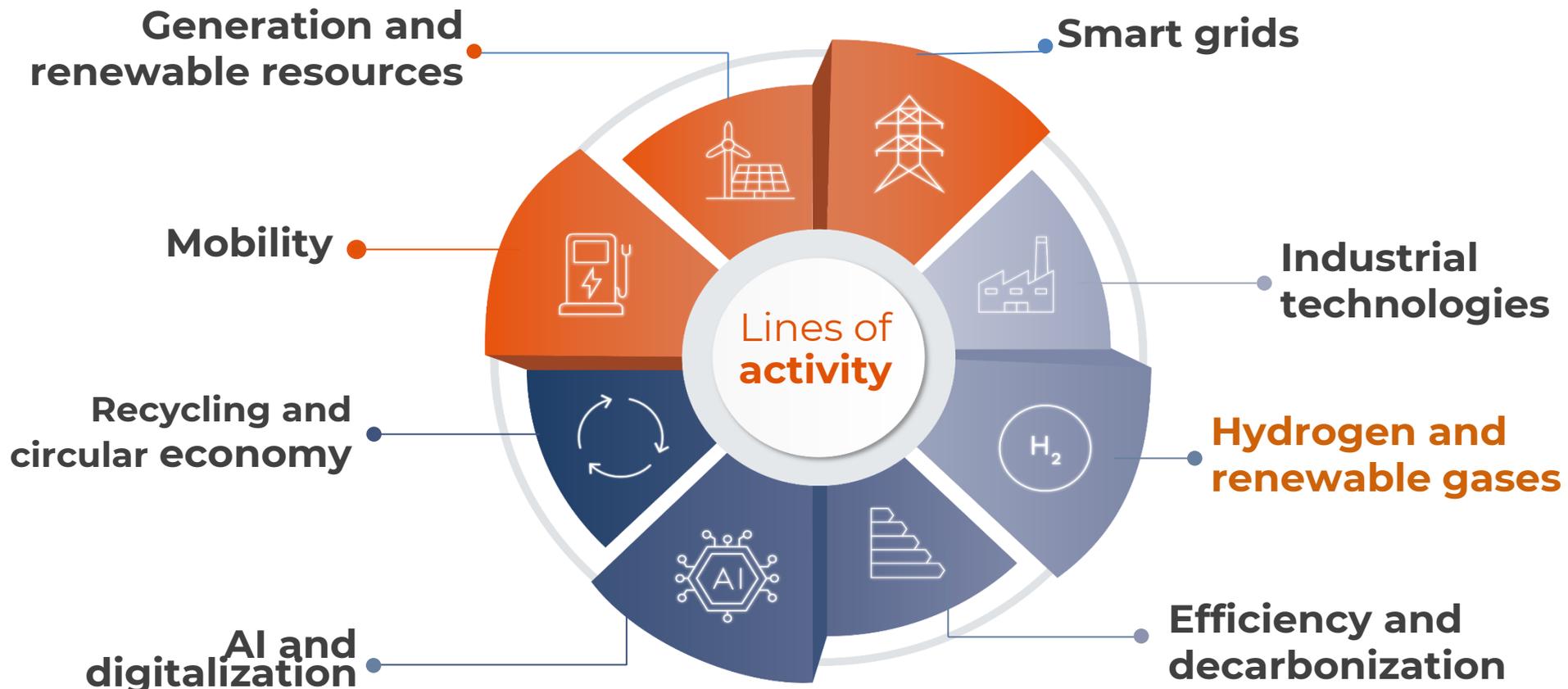
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Research centre

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1. CIRCE description

- **100% SELF-FINANCING**
- **88 PROJECTS AWARDED IN HORIZON EUROPE (25 COORDINATED)**



2. Our hydrogen capabilities

- Sizing and design of H2 and P2G value chain, matching supply and demand, and considering the mapping of industrial off-takers and local resources.
- Hybridisation of with RES technologies, integrating H2 as vector for storage, flexibility or use, optimizing sizing and scheduling of hydrogen production systems.
- Hydrogen production from waste and biomass (i.e. pyrolysis and gasification and fermentation).
- Multiphysics and CFD modelling applied to different points of the value chain (e.g. electrolyser thermal management, H2 integration in gas grid, H2 combustion in furnaces).
- Design of DC/DC and AC/DC converters to improve integration and control of electrolysers and for fuel cells integration.
- Industrial safety in H2 installations (including work with ATEX environment).



<https://www.fcirce.es/proyectos/proyecto-h24newage>

- Development of own infrastructure and lab
- H2 production and integration in industrial furnaces
- Safety, sustainability, certification



<https://cordis.europa.eu/project/id/101112098/es>

- Hydrogen valley development and integration
- Modelling of the integration of the electrolyser into the grid
- Development of a DSS for the conceptual design and upscaling of the valley

H2B:IMPACT



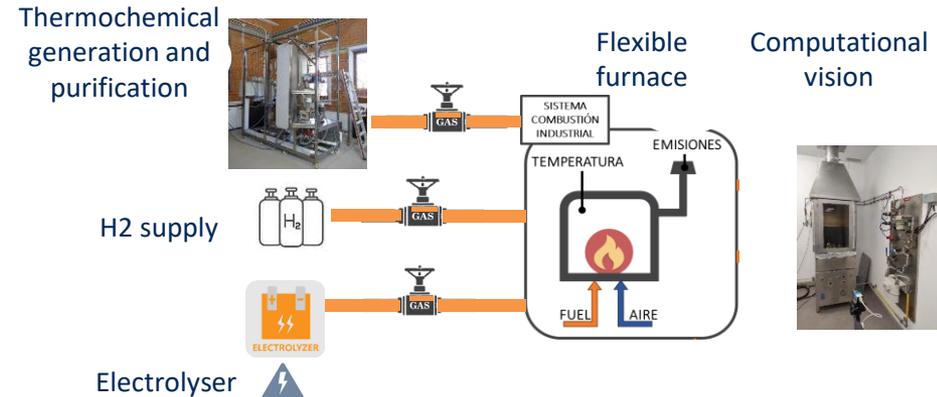
<https://cordis.europa.eu/project/id/101177996>

- Development of electric technologies for methanol and ammonia production
- CFD Modelling of reactors
- Simulation with integration with downstream processes

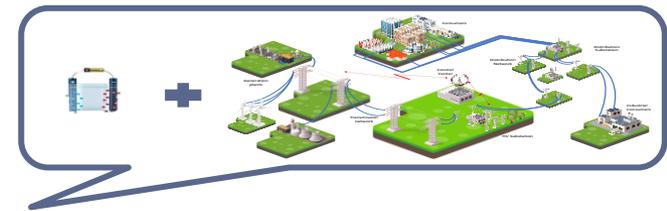
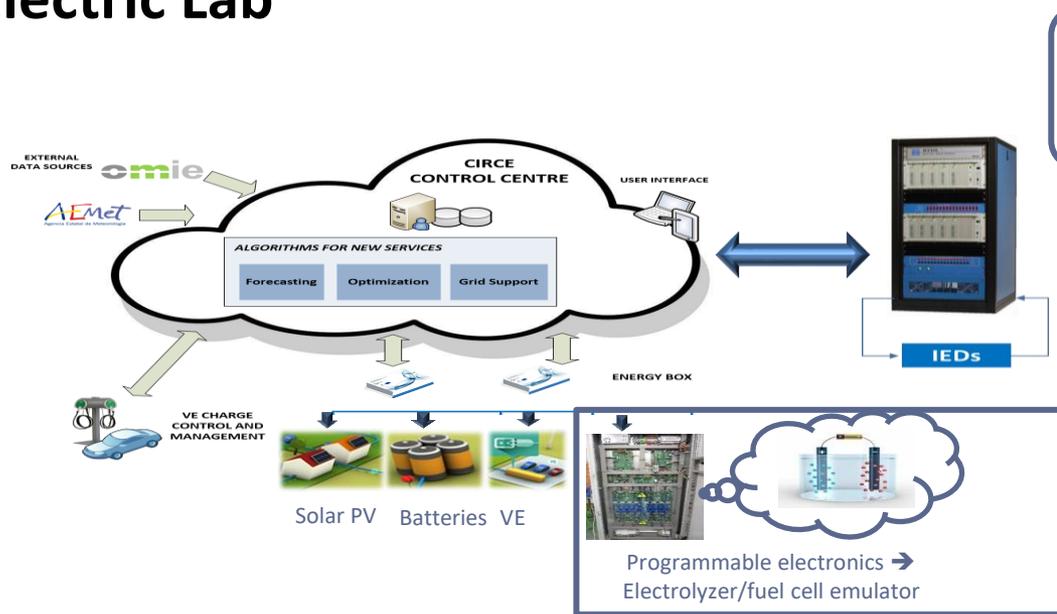
3. Lab infrastructure

Industrial H2 Lab:

- Flexible industrial furnace
- MW-assisted pilot plant for biomass pyrolysis
- Gasifier for the study of syngas production
- Water-Gas-Shift reactor
- Pilot storage facility to study H2 corrosion
- Gas distribution installation



Electric Lab



- Incorporation of H2 generation into network simulation platforms
- Flexibility evaluation, curtailments impact, ...
- Integration of electrolyzer/fuel cell (emulated) in Smart Grids microgrid laboratories
- Microgrid management control algorithms, including H2 generation

4. Topics of interest in calls 2026 (I)

Topic	Experience and Contribution
HORIZON-JU-CLEANH2-2026-01-02	<p>Experience: Process modelling, simulation and optimization, techno-economic evaluation of hydrogen systems.</p> <p>Contribution: Modelling of equipment and plant, development of digital assessment tool to evaluate multiple hydrogen plant configurations (from MW to GW), assessment of electrical infrastructure needs.</p>
HORIZON-JU-CLEANH2-2026-01-03	<p>Experience: Process modelling, simulation and optimization, energy management system, software and control systems development.</p> <p>Contribution: development of techniques for predictive maintenance and early detection of anomalies and monitoring system for electrolyzers</p>
HORIZON-JU-CLEANH2-2026-01-04	<p>Experience: Techno-economic evaluation of hydrogen systems.</p> <p>Contribution: detailed assessment of use cases, business model elaboration, definition of complex economic scenarios</p>
HORIZON-JU-CLEANH2-2026-01-05	<p>Experience: Thermochemical production from waste and biomass (i.e. pyrolysis and gasification); biological production from fermentation.</p> <p>Contribution: Pilot testing of hydrogen production from different sources. Process design and simulation. Integration with downstream processes. Process optimisation. Techno-economic assessment of the products obtained.</p>

4. Topics of interest in calls 2026 (II)

Topic	Experience and Contribution
HORIZON-JU-CLEANH2-2026-03-01	<p>Experience: Process modelling, simulation and optimization, energy management system, software and control systems development.</p> <p>Contribution: Fuel-cell Modelling, development of monitoring system for FC operation, control system for power electronics, HiL testing</p>
HORIZON-JU-CLEANH2-2026-03-04	<p>Experience: power electronics manufacturing and control system development</p> <p>Contribution: DC/DC integration and DC Grid for SOFC applications, development of SOFC control system, assessment of integration of H2-derivatives (e.g., methanol, ammonia)</p>
HORIZON-JU-CLEANH2-2026-04-02	<p>Experience: grid stability and integration, modelling and simulation capacity, software development and control systems.</p> <p>Contribution: assessment of ancillary services potential and impact into the electric grid, assessment of coupling with renewable energy sources, real-time optimization of control Smart tools.</p>
HORIZON-JU-CLEANH2-2026-06-01 HORIZON-JU-CLEANH2-2026-06-02	<p>Experience: Modelling and simulation capacity (DT, ROM, CFD), optimization of generation capacity, grid modelling, previous experience in conceptual design of H2 valleys (TH2CINO, H2B:IMPACT) and in supporting EU regions in their H2 strategies (CLEANH2 tender).</p> <p>Contribution: Sector coupling, use and exploitation of existing infrastructures and networks, bottle neck analysis, H2 and gas distribution, optimization models.</p>