



European  
Commission

# Putting cells to the test

Fuel cell & electrolyser testing for international standardization  
Harmonisation of procedures for research progress assessment

## EU policy and fuel cell technologies

The EU's transition towards a secure and competitive low-carbon society with energy and transport that are sustainable in economic, social and environmental terms is one of the main focuses, objectives and themes of the 2030 Energy Strategy and the Energy Security Strategy including a European Industrial Renaissance.

Building on the established role of the Joint Research Centre (JRC) in energy technologies, particularly for fuel cells & electrolyser and in facilitating innovation, harmonisation and standardisation as mandated by the regulation on European standardisation. JRC-IET initiates, performs and leads collaborative R&D activities at European level and within international forums such as the International Partnership for Hydrogen and Fuel Cells in the Economy (IPHE) and the Advanced Fuel Cell Implementing Agreement of the International Energy Agency (IEA).

It helps boost the European Energy Research Area through the support to policy makers, implementation & monitoring of EU particularly energy and transport policies, organising workshops, conferences & summer schools and providing access to test facilities and on-the-job-training for researchers from Member States and (potential) accession countries.

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Fuel cells generate electricity, heat and water via an electrochemical process: hydrogen from a hydrogen-containing fuel is combined with oxygen. Because of their high conversion efficiency, reduced pollution and low noise, fuel cells in the future will play a major role in energy conversion, and can partly substitute current power generation technologies in many end use sectors.

Electrolysers produce hydrogen and oxygen essentially by reversing the fuel cell reaction using DC (direct current) electricity often from intermittent renewable sources or surplus of the electricity grid thereby helping to balance its demand and supply. The hydrogen generated is stored and used locally to fuel vehicles, homes or energy generating devices, or added to the natural gas grid for later use.

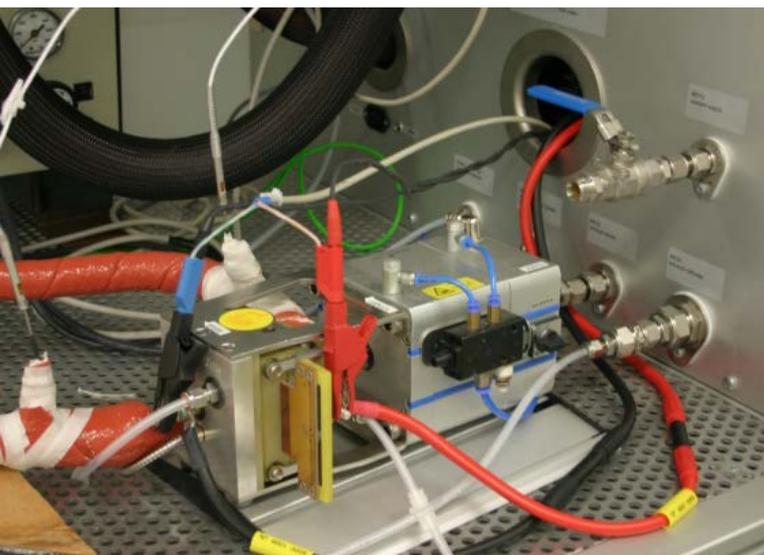
To realise their full potential in climate change mitigation, security of energy supply, sustainable development, economic growth, and industrial competitiveness, we must rise to meet the remaining technical and economic challenges. Among these, the development and establishment of globally accepted Regulations, Codes and Standards (RCS) are a key enabler of innovation while harmonised testing protocols & procedures aim to measure the progress made with methodologies allowing for a comprehensive, transparent and comparative assessment.

<https://ec.europa.eu/jrc/>

Joint  
Research  
Centre

JRC leads and contributes to the development of international standards under the International Organisation for Standardisation (ISO) and the International Electrotechnical Commission (IEC), and of EU standards under the European Committee for Standardisation (CEN) and the European Committee for Electrotechnical Standardisation (CENELEC).

It helps speed up the innovation process by establishing, harmonising and validating testing procedures, especially for cross-cutting activities through pre-normative research and underpinning research.



JRC leads within the FCH JTI (Fuel Cell & Hydrogen Joint Technology Initiative) the efforts on the development and validation of harmonised testing protocols & procedures for the assessment of single cell performance and durability for automotive fuel cells and fuel cells in stationary particularly CHP (combined heat & power) applications as well as PEM (polymer electrolyte membrane) cells in water electrolysis.

In validation testing, JRC uses its state-of-the-art research facilities that are reference laboratories promoting electro-mobility in Europe and providing access to it mainly via competitive projects where JRC acts as partner.

These efforts are complemented by the development of a common test hardware for single cells and the approach to evaluate numerical models predicting performance of fuel cells with their complex morphological, physical and chemical phenomena benefiting the community of developers from academia and industry alike.

