

PROJECT

## SH2E

# Sustainability Assessment of Harmonised Hydrogen Energy Systems: Guidelines for Life Cycle Sustainability Assessment and Prospective Benchmarking

**Funding:** European (Horizon 2020)

**Duration:** Jan 2021 - Jun 2024

**Status:** Ongoing

**Total project cost:** €2,142,779

**EU contribution:** €1,997,616



**Call for proposal:** H2020-JTI-FCH-2020-1

[CORDIS RCN : 232683](#)

### Objectives:

Hydrogen is expected to play a key role as an energy carrier in the path towards global sustainability. Nevertheless, the right decisions are needed to make fuel cells and hydrogen (FCH) systems effective. Besides technological advancements, methodological solutions that allow checking the suitability of FCH systems under sustainability aspects from a life-cycle perspective are needed to sensibly support decision-making. Such methodological contributions should rely on well-defined guidelines that allow a reliable assessment and benchmarking of FCH systems. In this sense, sound guidelines for Life Cycle Sustainability Assessment (LCSA) of FCH systems are urgently needed.

The goal of SH2E is to provide a harmonised (i.e. methodologically consistent) multi-dimensional framework for the LCSA and prospective benchmarking of FCH systems. To that end, SH2E will develop and demonstrate specific guidelines for the environmental (LCA), economic (LCC) and social (SLCA) life cycle assessment and benchmarking of FCH systems, while addressing their consistent integration into robust FCH-LCSA guidelines. These guidelines aim to be globally accepted as the reference document for LCSA of FCH systems and set the basis for future standardisation, going beyond the update of past initiatives such as the FC-HyGuide project and the IEA Hydrogen Task 36 through their reformulation to deal with underdeveloped topics such as material criticality and prospective assessment. For the sake of practicality and extended use of the guidelines, key SH2E outcomes also include user-friendly, open-access software tools with illustrative case studies, also being a source of publicly available data reviewed by a third party. Thus, the project is aligned with international initiatives towards global sustainability, including the Innovation Challenge on Renewable and Clean Hydrogen, by providing robust frameworks and tools that help decision-makers check the sustainability of FCH solutions.

### Parent Programmes:

[H2020-EU.3.3. - Horizon 2020: SOCIETAL CHALLENGES - Secure, clean and efficient energy](#)

[H2020-EU.3.4. - Horizon 2020: Smart, Green and Integrated Transport](#)

**Institute type:** Public institution

**Funding type:** Public (EU)

**Other programmes:** FCH-04-5-2020 Guidelines for Life Cycle Sustainability Assessment (LCSA) of fuel cell and hydrogen systems

### Lead Organisation:

**Fundacion Imdea Energia**

**Address:**

AVENIDA RAMON DE LA SAGRA 3  
28935 MOSTOLES MADRID  
Spain

**Organisation Website:**

<http://www.imdea.org/energia>

**EU Contribution:** €544,764

**Partner Organisations:****Forschungszentrum Julich Gmbh****Address:**

WILHELM JOHNEN STRASSE  
52428 JULICH  
Germany

**Organisation Website:**

<http://www.fz-juelich.de>

**EU Contribution:** €350,350

**Greendelta Gmbh****Address:**

KAISERDAMM 13  
14059 BERLIN  
Germany

**Organisation Website:**

<http://www.greendeltatc.com>

**EU Contribution:** €489,125

**Commissariat A L Energie Atomique Et Aux Energies Alternatives****Address:**

RUE LEBLANC 25  
75015 PARIS 15  
France

**Organisation Website:**

<http://www.cea.fr>

**EU Contribution:** €267,190

**Fundacion Para El Desarrollo De Las Nuevas Tecnologias Del Hidrogeno En Aragon****Address:**

CR ZARAGOZA N 330A KM 566 CUARTE  
22197 HUESCA  
Spain

**Organisation Website:**

<http://www.hidrogenoaragon.org>

**EU Contribution:** €164,938

**Symbio****Address:**

14 RUE JEAN PIERRE TIMBAUD  
38600 FONTAINE  
France

**Organisation Website:**

<http://www.symbiofcell.com>

**EU Contribution:** €181,250

## **Technologies:**

Fuel cells and hydrogen fuel  
Development of new Fuel Cells and Hydrogen (FCH) technologies

**Development phase:** Validation

Low-emission alternative energy for transport, Other

**STRIA Roadmaps:** specified

**Transport mode:** Multimodal transport

**Transport sectors:** Passenger transport, Freight transport

**Transport policies:**

Societal/Economic issues, Deployment planning/Financing/Market roll-out, Other specified

**Geo-spatial type:** Other