

SH2E

SUSTAINABILITY ASSESSMENT OF HARMONISED HYDROGEN ENERGY SYSTEMS: GUIDELINES FOR LIFE CYCLE SUSTAINABILITY ASSESSMENT AND PROSPECTIVE BENCHMARKING



Project ID	101007163
PRR 2024	Pillar 5 – Cross-cutting
Call topic	FCH-04-5-2020: Guidelines for life cycle sustainability assessment (LCSA) of fuel cell and hydrogen systems
Project total costs	EUR 2 142 778.75
Clean H₂ JU max. contribution	EUR 1 997 616.25
Project period	1.1.2021–30.6.2024
Coordinator	Fundación IMDEA Energía, Spain
Beneficiaries	Commissariat à l'énergie atomique et aux énergies alternatives, Forschungszentrum Jülich GmbH, Fundación para el Desarrollo de las Nuevas Tecnologías del Hidrógeno en Aragón, GreenDelta GmbH, Institute of Applied Energy, Symbio, Symbio France

<https://sh2e.eu/>

PROJECT AND GENERAL OBJECTIVES

The goal of SH2E is to provide a harmonised (i.e. methodologically consistent) multidimensional framework for the life-cycle sustainability assessment (LCSA) of fuel cell and hydrogen (FCH) systems. To that end, SH2E will develop and demonstrate specific guidelines for the environmental, economic and social life-cycle assessments (LCAs) and benchmarking of FCH systems, while addressing their consistent integration into robust FCH LCSA guidelines. The aim is for these guidelines to be globally accepted as the reference document for the LCSA of FCH systems and to set the basis for future standardisation.

NON-QUANTITATIVE OBJECTIVES

- SH2E aims to contribute to FCH systems' sustainability. The development of harmonised guidelines will contribute to assessing the sustainability of FCH systems.
- The project aims to contribute to social acceptance. Better knowledge of FCH systems' social and environmental impacts will contribute to their acceptance.
- It aims to contribute to standardisation. Harmonised guidelines will pave the way for a standard.

PROGRESS AND MAIN ACHIEVEMENTS

- SH2E reviewed the existing guidelines.
- The project reviewed case studies and projects.
- Environmental LCA guidelines were issued.

- Life-cycle cost assessment guidelines were issued.
- Social LCA guidelines were issued.
- LCSA guidelines were issued (interim version).
- The software tool for performing FCH life-cycle studies was issued (interim version).

FUTURE STEPS AND PLANS

- LCSA guideline validation will be undertaken by an external party.
- The final version of the LCSA guidelines will be issued by the end of the project.
- The final version of the software tool will be issued by the end of the project.



PROJECT TARGETS

Target source	Parameter	Unit	Target	Target achieved?
Project's own objectives	One integrated FCH LCA / LCC / social LCA / LCSA software tool	number	1	
	One document containing FCH LCSA guidelines with illustrative case studies after third-party review	number	1	
	Two FCH systems assessed and benchmarked	number	2	
	One document containing FCH LCA guidelines	number	1	
	One document containing FCH LCSA guidelines	number	1	
	Material criticality indicator	number	1	✓
	One document containing FCH LCC guidelines and one document containing FCH LCSA guidelines	number	2	