

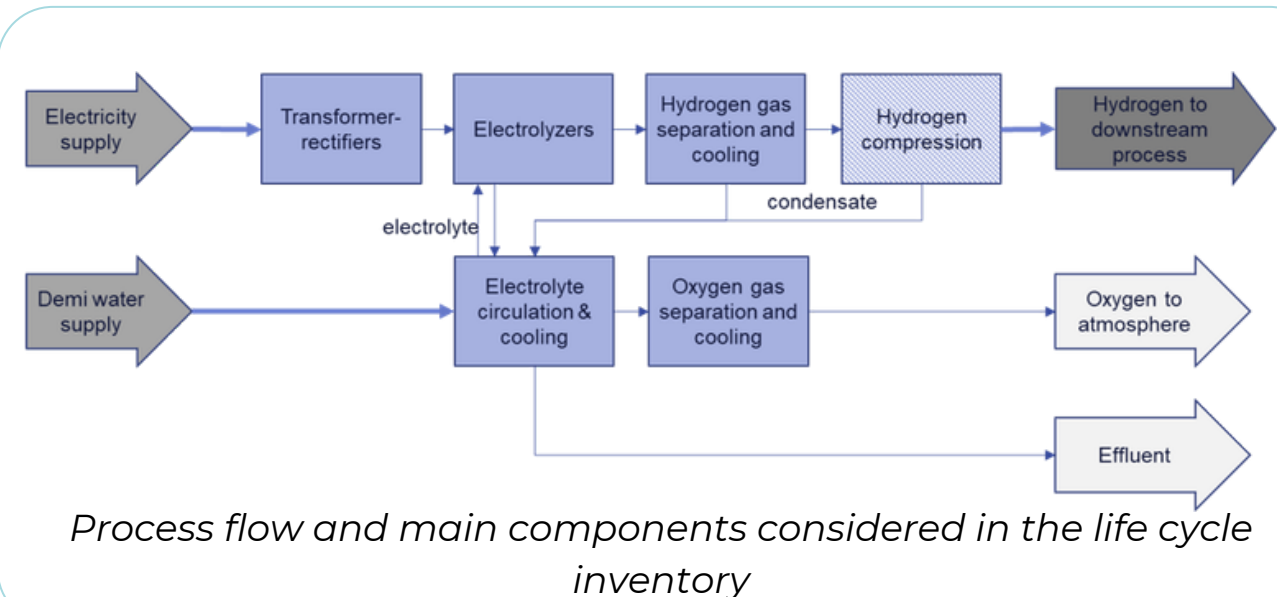
LIFE CYCLE INVENTORY DATA FOR HIGH-PRESSURE ALKALINE ELECTROLYSIS



Technology-specific, comprehensive and documented life cycle inventory (LCI) for full-scale high-pressure alkaline electrolysis, addressing the current lack of detailed and consistent environmental data for this technology

Description

- Comprehensive life cycle inventory (LCI) for a full-scale high-pressure alkaline water electrolysis plant
- Combines data extrapolated to full-scale operation and supplementary literature data for standard plant
- Provides detailed information to assess the environmental performance of hydrogen production from renewable energy using high-pressure alkaline electrolysis
- Identifies opportunities for further technology improvement



Owner

Technical University of Denmark (DTU)

Maturity of the Result

Complete and documented LCI dataset suitable for use in life cycle assessment studies

Impact

- 01 Provision of detailed environmental data for high-pressure alkaline electrolysis (environmental benchmarking)
- 02 Comparison of hydrogen production pathways
- 03 Identification of environmental hotspots and opportunities for technology improvement
- 04 More accurate life cycle assessment of renewable hydrogen production
- 05 Enhanced sustainability assessment of hydrogen and Power-to-X applications

Target Users

- Researchers & LCA practitioners: access to technology-specific inventory data for more accurate environmental assessments
- Electrolyser developers: identification of environmental hotspots and design improvement opportunities
- Hydrogen producers/developers: evidence base for comparing hydrogen production configurations
- Power-to-X technology developers: reliable input data for assessing the environmental performance of integrated systems

Collaboration opportunities

- Use of the dataset in R&D and LCA studies
- Environmental assessment of hydrogen and Power-to-X technologies
- Comparative assessment of electrolysis technologies
- Integration into LCA databases & modelling tools
- Scientific collaboration in data-driven technology improvement

Result Availability

Open access from November 2026:
[DTU Repository](https://www.h2peace.eu/)

More information

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- PEACE PROJECT: <https://www.h2peace.eu/>

COMPONENTS	1 BAR REFERENCE	30 BAR REFERENCE	90 BAR PEACE
SEPARATOR/MEMBRANE	Zirfon UTP 500	Zirfon UTP 500	Zirfon UTP 500
GASKETS	EPDM	EPDM	EPDM
FRAMES (GASKET SUPPORT)	Carbon steel	Carbon steel	Carbon steel
ANODE BASE MATERIAL	Perforated carbon steel	Nickel mesh	Nickel mesh
ANODE COATING	Ni plated (50 µm)	Ni Raney coating (50 µm)	Ni Raney coating (50 µm)
CATHODE BASE MATERIAL	Perforated carbon steel	Nickel mesh	Nickel mesh
CATHODE COATING	Ni plated (50 µm)	Ni Raney coating (50 µm)	Ni Raney coating (50 µm)
MATRRESS	Not applicable	Ni mattress	Ni mattress
BIPOLAR PLATE BASE MATERIAL	Carbon steel	Carbon steel	Carbon steel
BIPOLAR PLATE COATING	Ni plated (50 µm)	Ni plated (50 µm)	Ni plated (50 µm)
BIPOLAR PLATE NUTS AND BOLTS	Carbon steel	Not applicable	Not applicable
TIE RODS	Carbon steel	Carbon steel	Carbon steel
SPRINGS FOR TIE RODS	Carbon steel	Carbon steel	Carbon steel
END PLATES	Carbon steel	Carbon steel	Carbon steel
H-BEAMS / SUPPORT	Carbon steel	Carbon steel	Carbon steel
PRESSURE VESSEL	Not applicable	Not applicable	Carbon steel

Material Characteristics of the Reference Technologies and the PEACE Technology



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