
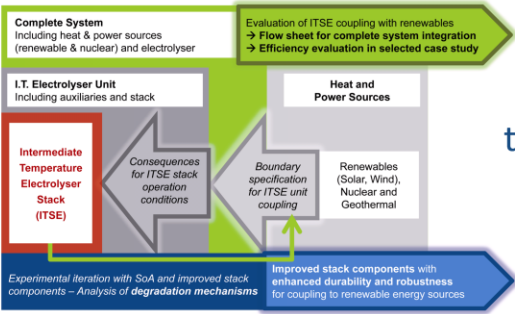


**ADvanced ELectrolyser  
for Hydrogen Production with  
Renewable Energy Sources**



**The ADEL project ... brings together:**



**Complete System**  
Including heat & power sources (renewable & nuclear) and electrolyser

**Evaluation of ITSE coupling with renewables**  
→ Flow sheet for complete system integration  
→ Efficiency evaluation in selected case study

**I.T. Electrolyser Unit**  
Including auxiliaries and stack

**Heat and Power Sources**

**Intermediate Temperature Electrolyser Stack (ITSE)**

Consequences for ITSE stack operation conditions

Boundary specification for ITSE unit coupling

Renewables (Solar, Wind), Nuclear and Geothermal

Experimental iteration with SoA and improved stack components – Analysis of degradation mechanisms

Improved stack components with enhanced durability and robustness for coupling to renewable energy sources

- institutions with unique expertise and along the entire value chain
- 13 highly qualified partners
- from 8 European countries

**targets:**

**hydrogen production that is**

- cost-competitive
- high energy efficient and sustainable
- based on renewable energy sources

**prospective application areas**

- carbon-free transportation
- long-term energy storage

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The ADEL project targets the development of cost-competitive, energy efficient and sustainable hydrogen production based on renewable energy sources. For such an ambitious target, the project is built on a two scales parallel approach:

1. At the stack level, the adaptation and development of cell, interconnect/coating and sealing components for ITSE operation conditions (T down to 600°C) aims at increasing the electrolyser durability.
2. At the system level, the development of flow sheets to analyse and quantify the coupling between the electrolyser unit (based on obtained stack data at 600°C) and renewable heat and power sources aims at identifying the most energy efficient solutions.

ADEL will contribute to the development of a portfolio of sustainable hydrogen production liable to meet 10% - 20% of the hydrogen demand for energy applications from carbon-free or lean energy sources by 2015.

The quantitative assessment of the coupling relevance of the ITSE unit with renewable energy sources such as solar or wind, as well as the preliminary dimensioning of a proof of concept technology demonstrator including an operating ITSE stack will constitute the final outcomes of the project. These results will pave the way to further demonstration and pre-commercialisation activities.

The project is co-funded by the 7th Framework Programme of the European Union (FP7) and the Fuel Cells and Hydrogen Joint Undertaking (FCH-JU).

Starting date: 1 January 2011 | Duration: 36 months.