

# AD ASTRA

## HARNESSING DEGRADATION MECHANISMS TO PRESCRIBE ACCELERATED STRESS TESTS FOR THE REALIZATION OF SOC LIFETIME PREDICTION ALGORITHMS



### Key Facts



**Funding Agency**  
EU FCH JU



**Project Call**  
FCH-04-3-2018



**Duration**  
01/2019 - 12/2021



**Coordinator**  
Italian National Agency for  
New Technologies, Energy  
and Sustainable Economic  
Development (ENEA)



- Partners**
- Commissariat à l'Énergie Atomique et aux Énergies Alternatives (CEA)
  - Danmarks Tekniske Universitet (DTU)
  - École Polytechnique Fédérale de Lausanne (EPFL)
  - Institute of Electrochemistry and Energy Systems (IEES)
  - SOLIDpower S.p.A.
  - Sunfire GmbH
  - Università degli studi di Genova (UNIGE)
  - Università degli studi di Salerno (UNISA)



**Website**  
[www.ad-astra.eu](http://www.ad-astra.eu)

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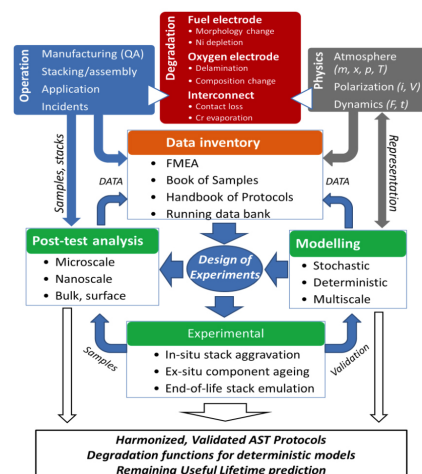
FUEL CELLS AND HYDROGEN  
JOINT UNDERTAKING

### Project Objectives

AD ASTRA aims to define Accelerated Stress Test (AST) protocols that will allow quantitative identification and prediction of critical degradation mechanisms. This will be realized by establishing first a multi-dimensional failure mode and effects analysis matrix for SOC stacks tested in the field; then AST protocols will be developed for realistic failure modes of critical SOC stack components (fuel electrode, oxygen electrode and interconnect). Thereafter, performance models will be developed by implementing degradation mechanisms in order to predict Remaining Useful Life. At the end of the project it is expected to define a *generalized methodology* for the definition of ASTs.

### EIFER's Contribution

EIFER is involved in the design of experiments and the development of protocols as well as in-situ accelerated test of stack in SOEC mode and data treatment to assess the degradation parameters. Further, EIFER is involved in modelling using the multiple prognosis approach to predict the lifetime of the system.



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