

# Design and Development of a Testbench Control System for a Solid Oxide Electrolyser

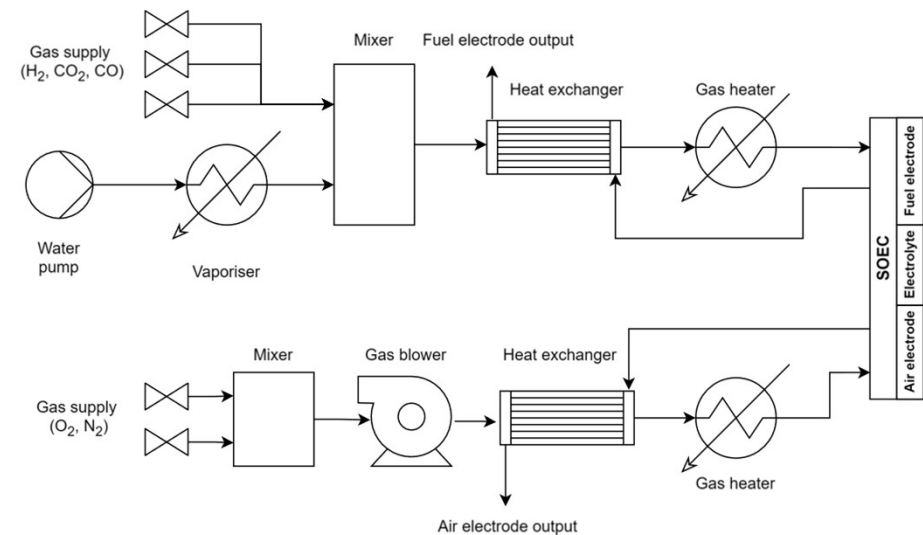
## Task description

High-temperature SOE (Solid Oxide Electrolysis) technology enables efficient green hydrogen production, achieving efficiencies over 80 % due to operating temperatures of 700-850°C, the highest among current electrolysis systems. It can also operate in co-electrolysis mode to produce syngas from  $H_2O$  and  $CO_2$ , an important feedstock e.g. for chemical or e-fuel production. However, despite its advantages, it faces challenges, particularly related to degradation and system-level studies.

To address this, an SOE electrolyser system will be built on a testbench for co-electrolysis. Based on existing control systems for low-temperature electrolysis testing, this thesis aims to design, implement and test a control system for the SOE electrolyser. The control system should support various operating states and integrate measurement systems for online monitoring.

## Assignments

- Literature research: Introduction to SOE technology and review of existing testbench control systems (1 month)
- System Design: Definition of design requirements, architecture, and operating strategies for the system (2 months)
- Implementation and Testing: Programming and integration of the control system, testing (2 months)
- Results presentation and thesis report writing (1 month)



**Start:** As of now

**Duration:** ca. 6 months

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