

Plantwide control for flexible operation of electrolysis systems

Introduction

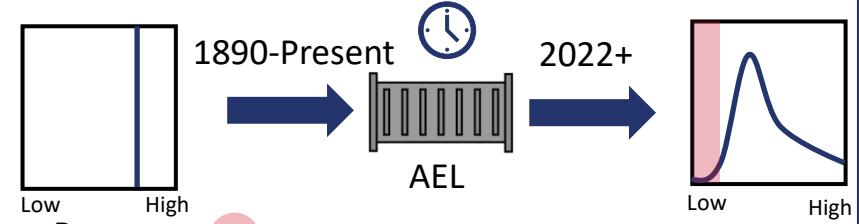
Coupling alkaline electrolysis processes with renewable energy sources requires rethinking electrolyzer operating practices that today assume constant power supply. We are developing control methods to enable safe and efficient operation for renewably fueled electrolysis systems, both on and off the electricity grid. The methodologies used are from the fields of process systems engineering, optimization and control.

Primary objective

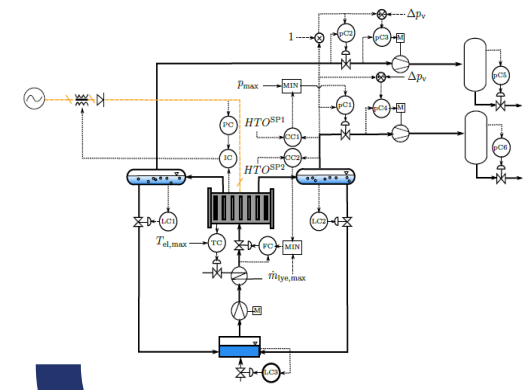
- Develop control strategies for the plantwide operation of electrolysis systems using renewable energies

Secondary objectives

- Elucidate bottlenecks in current operational practices
- Improve ways of handling the power input as a disturbance
- Analyse the control requirements for on-and off grid operation

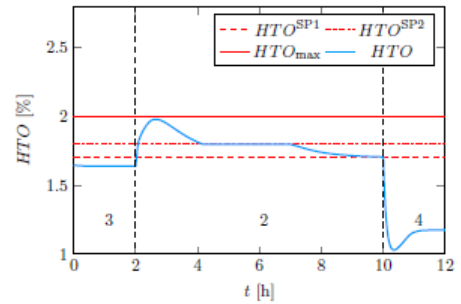


1 Change in power supply



2 Model and flowsheet development

3 Simulation, optimization and control



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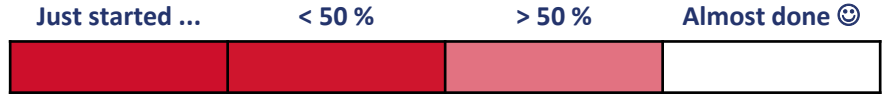
TU Delft ('19 - '21)

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Estimated progress of the PhD project:



Publications

- Cammann, L., Jäschke, J. (in press), A simple constraint-switching control structure for flexible operation of an alkaline water electrolyzer, *IFAC-PapersOnline*
- Cammann, L., Jäschke, J., Comparing operational strategies for alkaline electrolysis systems considering a probabilistic wind power distribution, *Computer Aided Chemical Engineering*



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