

Electrolyzer upscaling - balance of plant optimization

Client	ENTRANCE, Andras Perl
Related project	H2 Train and Learn Hub
Start date	Anytime
Suitable for training course(s)	Master graduation project
Learning Community	

Assignment description

Hydrogen is considered to be one of the most prominent energy carrier of the future. If it is produced with renewable energy, its carbon footprint stays minimal. Electrolysis of water is one of the hydrogen production methods that is being intensively investigated. While the core of electrolysis technology is more than 100 years old, the need to run an electrolyzer with highly intermittent renewable electricity brings extra challenges. Additionally, to really make hydrogen a serious player in the energy portfolio of today's society, its production price has to be significantly lowered.

Assignment

While the spotlight is more on the stack itself, the balance of plant components around the stack and their configuration are slightly overlooked. This assignment would focus on the investigation of the additional components that make the stack operate and help to deliver hydrogen at the required pressure and quality.

Research question

The produced raw hydrogen needs to be de-oxygenated (oxygen cross-over in the stack), dried and (possibly) compressed to the required application pressure. What is the optimal component size and process design when the electrolyzer runs on intermittent renewable electricity? How could the heat management be optimized to better use the waste heat? What is the impact of a stack that operates at high pressure on the system costs?

Problem definition

Accepting the challenges of this assignment, you will become an expert in the technical details of water electrolysis with some hands on experience on the technology.

General information

Final Product	Report
Location	Groningen
Parties involved	ENTRANCE, Hanze
Contact person	Andras Perl a.perl@pl.hanze.nl
Guidance	Andras Perl
Details	

What are we and where can you find us?

ENTRANCE is a learning knowledge community, in which students and teacher researchers from various programmes work together with researchers, companies, governments and civil society organisations to accelerate the energy transition.

ENTRANCE is the place where, as a student, you work together with lecturers, researchers, businesses, governments and/or civil society organizations on complex issues. We do this at the following locations:

- Location Proeftuin, Zernikelaan 17
- Location Energy Academy Europe, Nijenborgh 6.

What do we offer?

ENTRANCE offers you a multidisciplinary, inspiring learning, working and research environment in which you can develop the competencies needed to shape and accelerate the energy transition. There is room for collaboration with professors, researchers, lecturers and the professional field. In addition, you will be supervised by professionals who are part of the ENTRANCE Learning Communities (ELC).

Contact us

Are you interested in the vacancy? Do you have questions or would you like to apply directly?

- Jacqueline Joosse, Coordinator ENTRANCE Learning Communities.
- T: (050) 595 4708
- E: ENTRANCElc@org.hanze.nl

