Wastewater Treatment for Ecological Water Supply of Electrolysis Plants

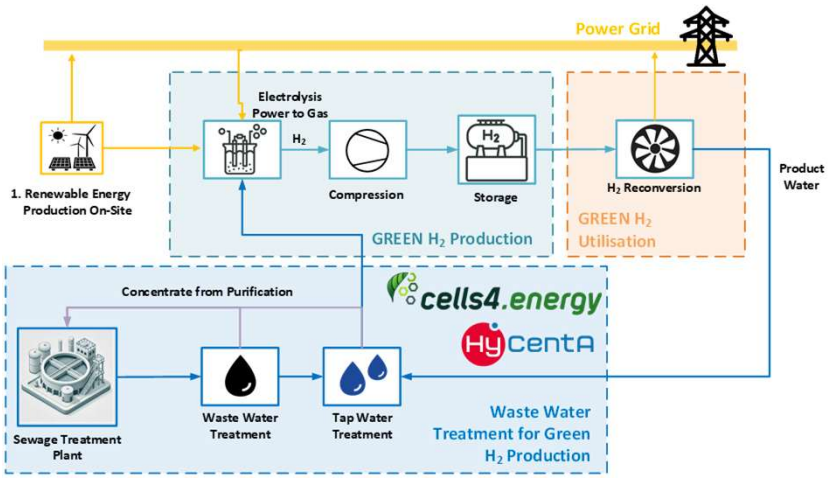

Fig. 1: Water treatment system according to ChatGPT

Description

Green hydrogen production through electrolysis is an important building block in the conversion of our energy systems to renewable energy sources. The production of hydrogen by electrolysis systems currently relies on tap water as the process medium. As global electrolysis capacity expands, a corresponding increase in water consumption is expected, which makes water supply an increasingly important issue, especially given the growing pressures of climate change on freshwater availability. One solution to this problem is to use wastewater sources instead of drinking water to supply the electrolysis systems.

The goal of this Master's thesis is to explore various methods for treating wastewater to generate feed water for electrolysis systems. Through a comprehensive literature review, the study will identify economically and technically feasible water treatment technologies.

Based on this research, a scalable and flexible water treatment concept will be developed. This concept will be implemented on a test bench, and the resulting water quality will be verified through laboratory analysis. Following this, the system's integration into an electrolysis test field will be carried out. Finally, a design for a scaled treatment system suitable for electrolysis systems up to 10 MW will be proposed.

Content / Time table:

- Literature research to identify the most appropriate water treatment technologies (1 month)
- Design of small scale water treatment concept (1 month)
- Test setup and execution of measurements (2 month)
- Data Analysis and upscaling of the concept (1 month)
- Thesis writing (1 months)

Start: as of now

Duration: approximately 6 months

Paid Master Thesis

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