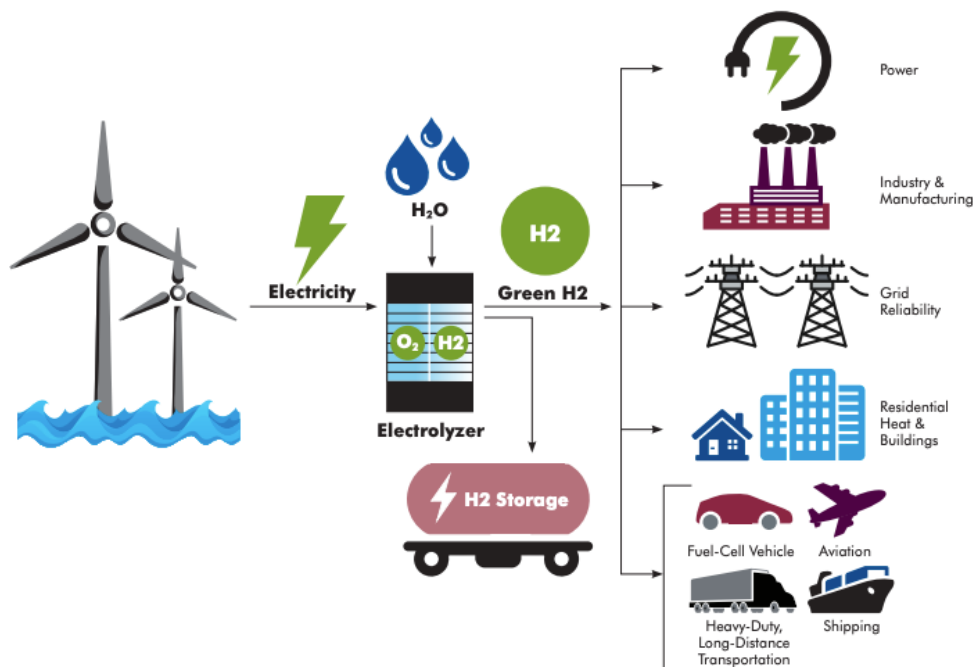


HiWi Position / Bachelor Thesis:

Modelling of Power System Components for a Digital Twin of the German Transmission Grid

Green hydrogen turns out to be more and more the missing piece to convert the German energy supply to renewable energy. In order to gain knowledge and experience to enable the integration of large-scale electrolysers in the gigawatt range into the power system, a 100 MW pilot plant will be built and operated within the HYPOWER project, which will be used to experiment and explore fundamentals in the construction and operation of large-scale electrolysers.



Source: Clean Energy States Alliance

In order to perform real-time analyses of the power system with regard to the integration of electrolysers into the power system, the ACS institute develops a digital twin of the German transmission grid. The digital twin will be built on the open-source simulator DPsim¹ which is implemented in C++. It's based on Modified Nodal Analysis and supports as key feature a new approach called Dynamic Phasor (DP) modelling. In this context, we are looking for a student to model, implement and test new power system components for the simulator as well as to perform system level simulations using DPsim.

¹ <https://www.fein-aachen.org/en/projects/dpsim/>

Tasks:

The scope of the HiWi Position/Bachelor thesis can be adapted to cover current research questions of the HYPOWER project and will relate to the following topics:

- Modelling and implementation of new power system components needed for the digital twin of the German transmission grid
- Adaption and improvement of current power system components
- Performing system level simulations
- Comparison of simulation results obtained with conventional phasor and dynamic phasor models

Requirements:

- Good knowledge of C++ is a prerequisite
- Experience in power system modelling is not necessary but a preferable skill
- Knowledge in Python and/or Simulink is a plus
- German or English is required

Our offer:

- The HiWi position is to be filled as soon as possible and is limited to 3 months, with the possibility of extension of up to 6 months. The regular weekly working time is 8-12 hours.
- The student will have the opportunity to gain hands-on experience in the field of power system simulations

If you are interested in the advertised position, please send your CV and current grades.

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