

### Project

This PhD project relates with ongoing research projects in the area of renewable energy powered membrane processes, in particular solar powered electro dialysis at IAMT. The removal of inorganic contaminants such as nitrate, arsenic, selenium, uranium and fluoride is a key priority. This project will explore the adaptation of the system to fluctuations in solar energy that results in a non-steady state operation.

The project will include i) operation of novel continuous electro dialysis system with fluctuating energy, ii) examination of water contaminants in brackish water treatment, iii) evaluate results in comparison to established nanofiltration and reverse osmosis processes, iv) national and international field work.

There are many aspects of this project, that require in-depth research and development, including;

- ◆ Feasibility studies on removal of contaminants in a solar powered electro dialysis process
- ◆ Establishment of the most suitable energy management scenario in collaboration with the renewable energy colleagues at IMT
- ◆ Elucidate the dominant separation mechanisms such that both fundamental understanding and optimized process performance can be achieved

The PhD project will be predominantly experimental and will begin with an identification of a set of research questions based on a detailed literature survey. A preliminary research proposal is required for the application stage with a timetable for a 4 year research project. Execution of the research plan through conducting of experiments, sample and data analysis and write up of results for scientific publication are part of the PhD process – a journey to become an independent researcher!

Throughout the project, there will be multiple opportunities for cooperation with internal and external partners, supervising master students, giving oral presentations at conferences, writing high-impact journal articles, as well as sharing your knowledge via (a minimal amount of) teaching. Career development through many team activities is an opportunity to attain leadership skills and prepare for exciting professional opportunities in industry or academia.



### Qualifications

The candidate will hold a Masters in Chemical, Process, Environmental Engineering, or equivalent and is a naturally curious person who is eager to learn more and has a strong interest in research. Experience with membrane filtration and electrochemical systems (of any scale) is a definite advantage, as well as being comfortable in specifying system components and sound experimental problem solving skills – as well a good common sense. Excellent English language proficiency is essential, basic German language skills of advantage.

### KIT

KIT is one of the biggest research institutions worldwide and has access to state-of-the-art research facilities resulting from the merger of the National Research Centre of the Helmholtz Association and the former Technical University of Karlsruhe. This project is hosted by the new Institute for Advanced Membrane Technology (IAMT) in collaboration with Prof. Bryce Richards (IMT). The PhD will be registered in the Faculty of Chemical and Process Engineering.

### Contact

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### Applications

Please send applications with CV, publication list and your contribution to the publication (if relevant), academic transcripts, degree certificates, contact details for three references and a preliminary research proposal to the above contact(s). A valid driver's licence will be required. A read of the Renewable Energy powered Membrane systems publications will assist preparations!