

Postdoc position to perform techno-economic and life-cycle assessments for a power-to-protein process

The research group of Environmental Biotechnology in the Center for Applied Geosciences at the University of Tübingen (<http://envbiotech.de/>) is looking for an excellent **postdoctoral researcher** to support our international, interdisciplinary, and dynamic team of environmental/biological/systems engineers, microbiologists, biotechnologists, and molecular biologists. The research in the Environmental Biotechnology group focuses on the recovery of carbon from diverse waste streams, and this includes single-cell protein production from carbon dioxide and hydrogen and oxygen gases, which we refer to as power-to-protein.

Qualified candidates would ideally have a doctoral degree in systems engineering, chemical/environmental engineering, process modeling, biotechnology, or related fields. The candidate should be able to perform techno-economic and life-cycle assessments on our biotechnological approach. The candidate should have hands-on experience with systems analysis or GIS techniques for value-chain optimization and resource mapping. This project will involve close collaborations within our group, but also with research groups from German or Danish institutions, including bioprocess engineers and researchers within the biotechnology field.

The project will focus on a biotechnological approach to radically change the way our societies produce protein for human consumption. Current agricultural practices to produce protein must be altered to save our planet. The current agricultural practices simply use too much land, water, and fossil fuels to feed a future 10 billion people. In this power-to-protein system, hydrogen and oxygen from electrolysis (water splitting) with renewable energy are combined with carbon dioxide in a 2-step bioprocess to produce protein. In the first step, hydrogen and carbon dioxide gases are converted into acetate with anaerobic bacteria, and in the second step, the dilute acetate is converted with oxygen gas into yeast biomass with approximately 45-65% protein. The growth nutrients, such as ammonium, will come from the safe recycling of wastes from humans. The main activity of the candidates will be to: 1) use process modeling to further scale and optimize this power-to-protein technology based on data from an ongoing bench-scale and a pilot-scale project; and 2) apply techno-economic and life-cycle modeling methods to evaluate power-to-protein technology for its economic and sustainable merits.

The successful candidate is expected to be involved in managing the project, which includes the supervision of bachelor and master students. Furthermore, she/he will closely interact

with collaboration partners. Therefore, very good English language skills are necessary. Other requirements include the ability to work independently and in teams, have excellent management and communication skills, and be self-motivated. The candidate will have the opportunity to present her/his results in international journals and conferences.

The position is intended to be filled as soon as possible. The contract is for 2 years and the employment will be arranged by the administration of the University of Tübingen (salary TVL E13, 100%). The adjustment takes place *via* the ZV. The University of Tübingen is seeking to increase the proportion of women in science and teaching, and therefore we are especially asking qualified women to apply. Disabled persons will be preferred in case of equal qualification.

Applications (in English), as one pdf document, including cover letter, CV, an overview of techniques and methods used in the past, transcripts, and diplomas, and contact address of at least two referees should be sent by email to application-envbiotech@ifg.uni-tuebingen.de. Applications will be accepted until the position is filled.

Prof. Lars Angenent

Environmental Biotechnology Group, Center for Applied Geosciences, University of Tübingen.