# Postdoc position in GHG emission and mitigation of the environmental and climate impact of agriculture

Are you motivated by minimizing emissions of greenhouse gases, ammonia, VOCs, and other air pollutants? Are you encouraged by creating knowledge, new technologies and methods and finding solutions that promote the green transition towards a more sustainable agricultural production with less impact on climate and the environment? If your focus is on environmental engineering or biochemical processes by developing and testing mitigation strategies or emission models centred around emissions from the agricultural waste management chain.

Then the Department of Biological and Chemical Engineering at Aarhus University invites you to apply for a Post Doc position.

## Expected start date and duration of employment

Applications are invited for a postdoc position with a length up to 2-year with the possibility of extension. The position is from February 15th 2025 or as soon possible.

## Job description

Agricultural waste such as liquid animal manure (slurry) is a major atmospheric source of greenhouse gases, ammonia, VOCs, odorants, and other air pollutants that contribute significantly to the environmental and climate impact of agriculture. At the same time, it is a valuable fertilizer source that may require long-term storage before field application with possible pre-storage treatment by anaerobic digestion to substitute fossil energy.

The postdoc candidate will be part of a research team where focus is on measuring and validating technologies that mitigate emissions and develop new methods to quantify emission from slurry stored in livestock buildings or outdoor storages. The project is closely related to the development of process models that can be used to estimate farm-scale greenhouse gas emission and so modelling may be part of the work.

The tasks in the project to be covered by the postdoc positions include:

- Developing experimental facilities and validate slurry treatments technologies such as acidification, use of additives, and controlled oxidation in pilot-scale.
- Developing new methods and carry out laboratory experiments for understanding and quantifying biochemical processes in stored slurry that lead to GHG and ammonia emission.
- Apply advanced online gas measuring instruments and begin able to process and handle large datasets from these instruments.
- Exploring the temporal and spatial distribution of microorganisms using the 16s rRNA gene for sequencing.
- Coordinate and delegate task related to storage and analysis of large amounts of slurry samples for both chemical and microbiological composition.
- Developing agro-emission models to understand, estimate and manage agricultural processes, process kinetics and emissions.

State-of-the-art analytical methods will be applied as key measurements in the research e.g. cavity ring-down spectroscopy (CRDS) and possibly proton-transfer-reaction mass spectrometry (PTR-MS). These instruments are applied in our pilot-scale slurry storage facilities and in our laboratory, typically in static or dynamic chambers. The tasks range from in-vitro laboratory experiments, where the candidate will be in charge of running experiments and developing novel methods for quantifying gas emission, to the development and management of pilot-scale slurry storage studies. The candidate will also coordinate with project partners that conduct full scale storage experiments.

The project involves collaboration with external partners from other universities and private organizations. You will be part of a world leading and dedicated research group

Application Deadline: 15 December 2024

Faculty: Faculty of Tech

Faculty of Technical Sciences

Institute/Faculty: Department of Biological and Chemical Engineering

Academic contact

person: Lise Bonne Guldberg Seniorrådgiver Ibg@bce.au.dk +4541893200

Vacant positions: 1

Hours per week: 37

Number of months: 24

Expected date of accession: 15/02/2025

Link to online CV chairman: https://pure.au.dk/portal /da/persons/henrikb.mo ller@bce.au.dk within agricultural emission. The group consists of multiple post docs, PhD students and permanent scientific staff that all work with agricultural emission quantification, technology validation or method development or modelling. The candidate will have two supervisors that offer supervision both related to the specific project tasks and to the candidate's career development. This offers a unique possibility to set and develop your own research profile within agricultural emissions at Aarhus University.

## Your profile

We are looking for a candidate with a PhD in Chemical Engineering, Biotechnology, Environmental Engineering or other relevant scientific background.

The successful candidates should have experience and expertise in at least four of the following areas:

- Experimental emission research and quantification of emission mitigation.
- Method development and validation.
- Experienced with anaerobic microbial processes.
- Experience with physical and chemical liquid waste/slurry characterization.
- Experience with online measurement systems such as cavity ring-down

spectroscopy (CRDS) and proton-transfer-reaction mass spectrometry (PTR-MS) is preferred.

- Handling of large datasets including statistical data treatment.
- Knowledge of the agricultural production system.
- Developing and understanding process-based modelling.
- Conducting and designing laboratory experiments for quantifying anaerobic processes in waste materials.

Furthermore, applicants are expected to:

- have strong cooperation and communication skills.
- be independent in their research.
- have strong skills in scientific writing and written English as documented by publication of peer-reviewed research articles.
- be a team player and contribute to a working environment with a positive atmosphere.
- have a driving license.

#### Who we are

The successful candidate is employed in the Section of Environmental Engineering, which is a part of Department of Biotechnology and Chemical Engineering. Researchers in the section develop environmental technologies as well as models of physical, chemical, and biological processes that are important for environmental quality. The research activities contribute to better management of animal manure and bio-waste through generation of new knowledge and quantification of mitigation effects. Emission of ammonia, greenhouse gases, VOCs, and sulfur compounds from manure management and biogas production for energy recovery from organic wastes have been the main applications to date. The work in this group is centered around basic chemistry, microbial transformations in natural and engineered ecosystems, mass transfer, data analysis, modelling and computer programming.

## What we offer

The department and section offer:

- a well-developed research infrastructure, laboratories, and access to shared equipment
- special facilities like a livestock housing climate laboratory, pilot-scale slurry storage facility, and a research biogas plant.
- an exciting interdisciplinary environment with many national, international and industrial collaborators

- a research climate encouraging lively, open and critical discussion within and across different fields of research
- a work environment with close working relationships, networking and social activities
- a workplace characterised by professionalism, equality and a healthy work-life balance.

#### Place of work and area of employment

The place of work is at Gustav Wieds Vej 10, 8000 Aarhus C and Blichers Allé 20, 8830 Tjele depending on the phase in the project, and the area of employment is Aarhus University with related departments.

Experimental work will be mainly conducted at AU Viborg, Blichers Allé 20, 8830 Tjele.

#### Contact information

For further information, please contact: Head of Section, Anders Feilberg, +45 3089 6099, af@bce.au.dk.

## Deadline

Applications must be received no later than December 15th 2024.

## Application procedure

Shortlisting is used. This means that after the deadline for applications – and with the assistance from the assessment committee chairman, and the appointment committee if necessary, – the head of department selects the candidates to be evaluated. All applicants will be notified whether or not their applications have been sent to an expert assessment committee for evaluation. The selected applicants will be informed about the composition of the committee, and each applicant is given the opportunity to comment on the part of the assessment that concerns him/her self. Once the recruitment process is completed a final letter of rejection is sent to the deselected applicants.

#### Letter of reference

If you want a referee to upload a letter of reference on your behalf, please state the referee's contact information when you submit your application. We strongly recommend that you make an agreement with the person in question before you enter the referee's contact information, and that you ensure that the referee has enough time to write the letter of reference before the application deadline. Unfortunately, it is not possible to ensure that letters of reference received after the application deadline will be taken into consideration.

#### Formalities and salary range

Technical Sciences refers to the <u>Ministerial Order on the Appointment of Academic</u> <u>Staff at Danish Universities under the Danish Ministry of Science, Technology and</u> <u>Innovation</u>.

The application must be in English and include a curriculum vitae, degree certificate, a complete list of publications, a statement of future research plans and information about research activities, teaching portfolio and verified information on previous teaching experience (if any). Guidelines for applicants can be found <u>here</u>.

Appointment shall be in accordance with the collective labour agreement between the Danish Ministry of Taxation and the Danish Confederation of Professional Associations. Further information on qualification requirements and job content may be found in the <u>Memorandum on Job Structure for Academic Staff at Danish Universities.</u>

Salary depends on seniority as agreed between the Danish Ministry of Taxation and the Confederation of Professional Associations.

Aarhus University's ambition is to be an attractive and inspiring workplace for all and to foster a culture in which each individual has opportunities to thrive, achieve and develop. We view equality and diversity as assets, and we welcome all applicants.

Research activities will be evaluated in relation to actual research time. Thus, we encourage applicants to specify periods of leave without research activities, in order to

be able to subtract these periods from the span of the scientific career during the evaluation of scientific productivity.

Aarhus University offers a broad variety of services for international researchers and accompanying families, including relocation service and career counselling to expat partners. Read more <u>here</u>. Please find more information about entering and working in Denmark <u>here</u>.

Aarhus University also offers a Junior Researcher Development Programme targeted at career development for postdocs at AU. You can read more about it <u>here</u>.

The application must be submitted via Aarhus University's recruitment system, which can be accessed under the job advertisement on Aarhus University's website.

## Aarhus University

Aarhus University is an academically diverse and research-intensive university with a strong commitment to high-quality research and education and the development of society nationally and globally. The university offers an inspiring research and teaching environment to its 38,000 students (FTEs) and 8,300 employees, and has an annual revenues of EUR 935 million. Learn more at <u>www.international.au.dk/</u>