



Biorefinery Pilot Plant Engineer and Project Manager (Rural BioReFarmeries)

University College/ Management Unit	Munster Technological University
University School/ Unit	CircBio Research Group
Project Title	Rural BioReFarmeries
Post Duration	24 months
Supervisors/ Mentors	James Gaffey
Project Partners	Collaborative EU project – many industry/academic partners https://www.cbe.europa.eu/projects/rural-biorefarmeries
Main Location for project	MTU Kerry and Farm Zero C
Funding source	Circular Biobased Europe Joint Undertaking
Provisional start date	1 st December 2024
BiOrbic Challenge alignment	Climate Neutral Animal Agriculture
Salary	€43,768 per annum

Summary

The Circular Bioeconomy is a thematic area of research at Munster Technological University in Ireland, led by the Circular Bioeconomy Research Group (CircBio) based at the Shannon Applied Biotechnology Centre. This multi-disciplinary team leads and participates on a range of exciting, high impact, national and international research projects including Rural BioReFarmeries, Farm Zero C, Biorefinery Glas, INFORMBIO, BIOSWITCH, BBioNets, BIO4AFRICA, COOPID, MainstreamBIO ROBIN. BioAssess and many more. Research activities of CircBio focus upon improving the value and circularity of raw materials and waste, sustainable product development, analyzing, monitoring the impact of sustainable technologies and practices, and engaging with primary producers, industry, government and relevant stakeholders to ensure research impact is maximized with real-world impact.

The group plays a leading role in the development of bio-based technologies for processing feedstocks from grasses to seaweeds, for the development of sustainable bio-based materials. The successful candidate will work on some of the group's exciting international projects in this domain. This position will suit candidates with previous experience of bioeconomy-related domains such as biorefining, bioenergy and nutrient recycling.

Munster Technological University, through CircBio will lead a new first-of-its-kind decentralised green biorefinery demonstration initiative funded under the Circular Bio-based Europe Joint Undertaking (CBE JU). "Rural BioReFarmeries" project will advance the development of farmcentred bioeconomy approaches through the deployment of green biorefineries across grassland regions of Europe.

Two primary green biorefinery and anaerobic digestion demonstration sites in Ireland and Denmark will optimise the conversion of grasses, clover and green biomass residues sourced from local farms into value-added products such as human and animal grade protein, bio-



based food packaging, flavours, anti-microbials, fertiliser and energy, in collaboration with upstream research and industrial sites in Netherlands, Ireland, Denmark and Poland.

Description of Work

This position of “Biorefinery Pilot Plant Engineer and Project Manager” will help to oversee the implementation and management of a grass biorefinery demo facility at Farm Zero C, Cork Ireland. The researcher will work closely with the MTU project team, based at Kerry (Tralee) and Cork, along with the broader Farm Zero C Team at Shinagh Farm. In the addition the researcher will collaborate closely with Irish and EU downstream partners (who will further analyse projects), industry (product end-users) and the green biorefinery demonstration plant of Aarhus University, Viborg, home to the Danish demo site.

Tasks and Responsibilities include:

- Operate, implement the Rural BioReFarmeries farm-scale green biorefinery demonstration facility at Farm Zero C, Ireland, with support from supervisor and colleagues
- Collaborate with project and farm colleagues to schedule the timely provision of green biomass feedstock in a suitable manner for processing within the green biorefinery
- Manage biorefinery equipment and parameters for the conversion of biomass into different co-products (e.g., press cake, protein concentrate and brown juice)
- Test different green biorefinery feedstocks under different processing conditions (e.g., different biorefinery pre-treatment systems)
- Liaise with fellow Rural BioReFarmeries researchers to allow for sample taking from different process streams which will be investigated by fellow researchers and industry partners downstream
- Record data related to process parameters to enable process optimization (e.g., temperature, pressures, throughput, yields etc) and development of mass and energy balances for subsequent by research colleagues in studies such as LCA and technoeconomics
- Develop with supervisor and colleagues a standardized method for collection, comparison and analysis of green biorefinery feedstock and process data
- Liaise closely with the biorefinery team from our sister green biorefinery demo site at Aarhus University, Viborg to collect and compare data, along with the wider Rural BioReFarmeries project team
- Ensure that risks within the biorefinery are identified and mitigated in collaboration with supervisor
- Ensure that the biorefinery is maintained and/or repair at regular intervals and as necessary over time
- Liaise with colleagues on secure management and supply of sample co-products to colleagues and partners
- Support CircBio team colleagues on bench and pilot scale processing prior to scale up
- Support the Rural BioReFarmeries team in efforts to scale activities from bench to pilot
- Collaborate with and support coordinator on day-to-day Rural BioReFarmeries management and reporting activities



- Mentoring of PhD students involved in tasks related to the green biorefinery and Rural BioReFarmeries projects
- Management and mitigation of project risks related to green biorefinery implementation Liaise with partners (CircBio, University of Galway, BiOrbic, UCD, TCD and others) working to optimize and scale anaerobic digestion process from biorefinery residues
- Participate in, contribute to and co-organize project related external events such as demonstration days, workshops, training and promotional events, as well as internal project meetings
- Contribute to future green biorefinery design and development work
- Writing technical reports and contributing to peer-reviewed publications
- Contributing to the broader activities of CircBio and Rural BioReFarmeries

Candidates must demonstrate the following:

- ✓ BSc/BEng, MSc or PhD in a related area (e.g., process engineering, marine engineer (Maskin Mester), agricultural engineering, mechanical engineering etc.)
- ✓ Relevant technical background with experience in operations engineering and process management, ideally within a biomass-related position, or other relevant areas such as marine, food and agriculture industry and energy industry etc.
- ✓ Experience of participation in industrially-relevant commercial or pilot projects, maintaining and optimizing process parameters like heat, steam and pressure
- ✓ Experience in the maintenance and/or repair of engineering equipment/facilities
- ✓ Experience in capturing, comparing and analysing process and sample data
- ✓ Genuine enthusiasm about working on an innovative bioeconomy project in a farmbased environment
- ✓ Strong leadership capability
- ✓ Experience of teamworking in a multidisciplinary operational environments
- ✓ Self-motivated and strong ability to work on own initiative will be essential to the role
- ✓ Ability to follow instruction of project PIs and collaborate with other team members is also a requirement
- ✓ Excellent interpersonal, communication, presentation and organizational skills
- ✓ A full drivers license is required in order to access the farm and other relevant sites

The following is desirable:

- ✓ Knowledge and experience of biorefinery process systems and extraction of products (e.g., proteins/sugars) from biomass
- ✓ Any experience of grassland or other green biomass feedstocks (legumes, green crop wastes) suitable for green biorefinery as well as logistics
- ✓ Previous experience of research in a demonstration of farm-related environment
- ✓ Strong technical background, including track record of technical report preparation is highly desirable
- ✓ Experience of project management, and demonstrable ability to plan and implement tasks in a timely manner
- ✓ Excellent track record of delivering technical reports and/or publications



Salary: Full position at €43,768 per annum. The post is of 24 months duration and may be extended.

Application Procedure: All applications to be made online at www.mtu.ie/vacancies

Location: This post is based within the Circular Bioeconomy Research Group (CircBio) at Munster Technological University in Tralee however, the normal working place will be located at Farm Zero C at Shinagh Estates Farm in Bandon, Co. Cork. Travel between these locations for supervision and meetings will be expected from time to time, while occasional national and international visits will be essential for training and to collaborate with project partners and funders

Citizenship Requirement: Candidates should note that eligibility to compete for posts is open to citizens of the European Economic Area (EEA) or to non-EEA nationals with a valid work permit. The EEA consists of the Member States of the European Union, United Kingdom along with Iceland, Liechtenstein and Norway. Swiss citizens under EU agreements may also apply. It is an offence under the Employment Permits Acts 2003 and 2006 for both an employer and an employee if a non-EEA National is in employment without an appropriate employment permit. Employment permit holders can only work for the employer named on the permit.

Informal Enquiries: Informal enquiries **ONLY** to James Gaffey james.gaffey@mtu.ie

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Closing date for applications is 1.00pm Friday, 11th October 2024

Applications received after the closing date will not be accepted.

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