Project: **Co-funded Industry PhD Scholarship – Snowy Hydro**

Location: Federation University Australia (FedUni), at Gippsland Campus Churchill, and Australian Paper nearby in Maryvale

Surname

Given name

Address

Telephone Email

Are you a current FedUni HDR candidate?

Yes Student ID:

No Complete the HDR Candidature application in addition to the Scholarship application

**Successful applicants will be expected to commence by 4th November 2019. However, the commencement date may be negotiated by the successful candidate.**

For questions related to the research project, please contact Professor Steve Wilcox (03 5122 6176, steve.wilcox@federation.edu.au).

**Conditions**

Scholarships are available for domestic students (Australian citizens and permanent residents) only and will require the candidate to be domiciled in the Latrobe Valley region. Scholarships are full-time, with no possibility of being undertaken part-time during candidature. Students will be expected to commit to forty hours per week for the period of their study, with 40% being allocated at Australian Paper. The remainder of the study will be at the University in Churchill. Scholarships are for a period of one and a half years. Extension to scholarships will not be granted.

View the general conditions for [Fed Uni HDR Scholarships on the Research Website](http://federation.edu.au/research/study-with-us/scholarships/evaluation-of-applications). Where these conditions differ to those on this form, the conditions outlined for this specific scholarship take precedence.

**Eligibility to undertake Masters by Research**

Scholarship applicants must also be eligible to undertake a Masters by Research. Verify you can meet [eligibility requirements outlined on the Research website](http://federation.edu.au/research/study-with-us/apply/check-your-eligibility). If you are applying for ‘[Honours equivalence](http://federation.edu.au/research/study-with-us/apply/check-your-eligibility/honours-equivalence),’ please ensure that you provide detailed information to support your case.

**Referees**

Nominate one referee who can comment on your academic and research experience and capacity, and one referee who can comment on your industry and work experience, particularly in relation to the research project area. Referee reports must be returned to Research Services by Wednesday 25/09/2019 for your application to be considered. Any applicant without referee report forms will not be forwarded for consideration.

All prospective candidates are required to provide a 1000 word statement covering the following areas:

* Discuss your motivations for applying for this Masters by Research scholarship, and your intended outcomes (both for yourself (personally and professionally), and for the sector)
* Discuss some of the key policy imperatives/directions, and existing research literature, which impact this topic area
* Discuss the opportunities and constraints of the proposed methodology (or, where a methodology has not been explicitly identified, please identify a relevant methodology and discuss the opportunities and constraints)
* Discuss potential challenges and how you might overcome them
* Please note, you are not required to provide the 250 project summary requested on the HDR Application for Enrolment Form – however you must note that you are applying for Scholarship.

Please list all documents provided, including supporting information:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Required Documents |  | Other Supporting Documents |
|  | [HDR Application for Enrolment Form](https://federation.edu.au/research/study-with-us/apply/submit-your-application) |  | List of published works |
|  | 1000 word statement |  | Professional memberships |
|  | Qualifications |  |  |
|  | Transcripts |  |  |
|  | Scholarship Application (this form) |  |  |

**For questions regarding the application process for scholarships and candidature, please contact the Graduate Research School at:** [**research.degrees@federation.edu.au**](mailto:research.degrees@federation.edu.au) **or via telephone on (03) 5327 9508.**

**Applications for the scholarship close on Friday 20/09/2019 and can be submitted via mail, email or in person**

For general scholarship and candidature information, please contact:

Graduate Research School,   
Federation University Australia,   
Gippsland Campus  
Northways Rd  
Churchill VIC 3842  
Telephone: 03 5327 9508  
Email: [research.degrees@federation.edu.au](mailto:research.degrees@federation.edu.au)

Bioproduction of Platform Chemicals from Waste Streams

Research project outline

**The problem / opportunity this project is aiming to solve / realise;**

Countries across the world have started transitioning towards circular economies to mitigate climate change, tackle pollution and ensure resource sustainability. Biomass will play a significant role in this transition as a resource for materials and products. In this broader context, the vision of this project is to contribute towards the creation of high value biochemicals and advanced materials from biomass at Australian Paper and the Gippsland region of Australia.

**The technology base for the project;**

Platform chemicals are building blocks of the chemicals and plastics industry, produced using fossil fuels as feedstock. Today’s technological advancements have allowed us to produce biochemicals as their replacement, which can be synthesised by microorganisms using various carbon sources (substrates). Acetic and succinic acids are already commercially produced using biomass feedstock. The challenge in this project is to utilise non-food and waste bio-resources as feedstock for biochemicals such as Australian Paper’s wastestreams. Addressing this challenge includes development of the next generation carbon-neutral wastestream treatment technologies to turn carbon-rich waste streams into new bio-based chemicals and materials. Lab scale fermentation technology will be used to produce platform chemicals from carbon rich wastestreams.

**The research plan to deliver the project’s objectives;**

* Select fermentation conditions and organisms or chemical processes that are most likely to successfully convert hemicellulose rich wastestreams to valuable platform chemicals;
* Optimise conditions for platform chemicals at the laboratory scale; and
* Isolate and characterise products from the fermentation media.

This project will utilise the lab scale preparation and analytical capabilities at Federation University Australia to develop a commercially practicable fermentation or chemical process for biochemical/s production. Succinic and acetic acids will be investigated as priority platform chemicals.

M.Phil. student under direction by the Principal Investigator (PI) will carryout fermentation protocols to convert non-food biomass sources into platform chemicals. Criteria for the selection of fermentation technology include cost effectiveness, environmental impact, safety and practicality at industrial scale. The MPhil student will focus on research into optimising the process and its effect on the structure, and yield of the biochemicals.

**Outcomes**

The outcomes of this M.Phil. project are conversion of bioresource (e.g. waste hemicellulose) into platform chemicals like succinic and acetic acids that would have significant benefit to Australian Paper. The microbial fermentation and purification of the platform chemicals is needed to enable their upgradation into high value products. This project will provide validated data for platform chemical manufacturing at Australian Paper. The successful applicant would be working in a team with Dr Vince Verheyen.

For this project we are looking for an enthusiastic and highly motivated candidate with experience in bacterial fermentation technologies and skills in analytical chemistry. The candidate is expected to work in close collaboration with other students and researchers requiring good communication skills as well as ability for teamwork and cooperation.

**Industry Partner and Student Host:** Australian Paper, Maryvale

**Academic Supervisor:** Professor Steve Wilcox, Associate Professor Vince Verheyen, Dr Andrew Greenhill and Dr Alicia Reynolds

**Industry Co-Supervisor:** Dr. David Vercoe

CRICOS Provider No. 00103D | RTO Code 4909

Project: Improving the Reliability of Streamflow and Water Level Forecasting using Artificial Intelligence Techniques

Location: Mt Helen/ Churchill campus

Surname

Given name

Address

Telephone Email

Are you a current Federation University HDR candidate?

Yes Student ID:

No Complete the HDR Candidature application in addition to the Scholarship application

**Successful applicants will be expected to commence in SEMESTER 1. However, the commencement date may be negotiated by the successful candidate.**

For questions related to the research project, please contact Dr Tanveer Choudhury at t.choudhury@federation.edu.au.

**Conditions**

The scholarship is available for domestic students (Australian citizens and permanent residents). Scholarship is full-time, with no possibility of being undertaken part-time during candidature. Student will be expected to commit to forty hours per week for the period of their study. The scholarship is for a period of three years. Extension to scholarships will not be granted.

View the general conditions for [Federation University HDR Scholarships on the Graduate Research School website](http://federation.edu.au/research/study-with-us/scholarships/evaluation-of-applications). Where these conditions differ to those on this form, the conditions outlined for this specific scholarship take precedence.

**Eligibility to undertake PhD**

Scholarship applicants must be eligible to undertake a PhD. Verify you can meet [eligibility requirements outlined on the Graduate Research School website](http://federation.edu.au/research/study-with-us/apply/check-your-eligibility). If you are applying for ‘[Honours equivalence](http://federation.edu.au/research/study-with-us/apply/check-your-eligibility/honours-equivalence),’ please ensure that you provide detailed information to support your case.

**Referees**

Nominate one referee who can comment on your academic and research experience and capacity, and one referee who can comment on your industry and work experience, particularly in relation to the research project area. Referee reports must be returned to Graduate Research School no later than one week later than submission of your application for it to be considered. Any applicant without referee report forms will not be forwarded for consideration.

All prospective candidates are required to provide a 1000 word statement covering the following areas:

* Discuss your motivations for applying for this PhD scholarship, and your intended outcomes (both for yourself (personally and professionally), and for the sector)
* Discuss some of the key policy imperatives/directions, and existing research literature, which impact this topic area
* Discuss the opportunities and constraints of the proposed methodology (or, where a methodology has not been explicitly identified, please identify a relevant methodology and discuss the opportunities and constraints)
* Discuss potential challenges and how you might overcome them
* Please note, you are not required to provide the 250 project summary requested on the HDR Application for Enrolment Form – however you must note that you are applying for this Scholarship specifically.

Please list all documents provided, including supporting information:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Required Documents |  | Other Supporting Documents |
|  | [HDR Application for Enrolment Form](https://federation.edu.au/research/study-with-us/apply/submit-your-application) |  | List of published works |
|  | 1000 word statement |  | Professional memberships |
|  | Qualifications |  |  |
|  | Transcripts |  |  |
|  | Scholarship Application (this form) |  |  |

**For questions regarding the application process for scholarships and candidature, please contact the Graduate Research School at:** [**research.degrees@federation.edu.au**](mailto:research.degrees@federation.edu.au) **or via telephone on (03) 5327 9508.**

**Applications for the scholarship will remain open until the position is filled. Applications can be submitted via mail, email or in person**

For general scholarship and candidature information, please contact:

Graduate Research School,   
Federation University Australia,   
Gippsland Campus  
Northways Rd  
Churchill VIC 3842  
Telephone: 03 5327 9508  
Email: [research.degrees@federation.edu.au](mailto:research.degrees@federation.edu.au)

Co-funded Industry PhD Scholarship

Improving the Reliability of Streamflow and Water Level Forecasting using Artificial Intelligence Techniques

This research proposes investigation and use of artificial intelligence techniques to develop robust predictive methodology for streamflow and water level based on currently collected time-series data. The project will also look at developing or refining an information management system that facilitates collection and management of the time-series data specifically for robust prediction. Research will include a comprehensive sensitivity analysis to compare current Snowy Hydro methods with the newly developed methods, and to validate and increase confidence in the proposed technique(s).

It is expected the research student would spend periods of time at Snowy Hydro offices and field sites to ensure a sound understanding of both the physical hydrologic systems and also the associated monitoring and information systems Snowy Hydro rely on and use. Time will also be spent to understand the current predictive models that Snowy Hydro use so that appropriate comparison can be made to the new methods and techniques developed.

**Industry Partner and Student Host:** Snowy Hydro Limited

**Academic Supervisor:** Associate Professor Andrew Barton & Dr Tanveer Choudhury

**Industry Co-Supervisor:** Dr Thomas Chubb