

# ALEXANDER ROBERT LAMOND

PhD, MEng, AMIChemE

RENEWABLE ENERGY SPECIALIST • CHEMICAL ENGINEER

✉ alexander.lamond@nottingham.ac.uk | ☎ +44 (0) 7720 373 595 |  Alexander Lamond

“ I am a chemical engineer with knowledge and experience in techno-economic analysis of renewable energy systems as well as mathematical modelling of gas separation and digestion processes. ”

— A.R. Lamond, 13 March 2019

## EXPERTISE

- ⇒ **Renewable energy systems:** specialise in AD, biogas, biomethane, hydrogen and fuel cells.
- ⇒ **Systems analysis:** techno-economic, environmental analysis and mathematical modelling.
- ⇒ **Mass transfer & chemical reaction:** membrane gas separation and enzyme reactions.
- ⇒ **Data handling & analysis:** Excel, Matlab and Python.

## EXPERIENCE

- JAN 2018 – PRESENT | **Research Associate** *University of Nottingham*  
→ This role involved mathematical modelling of the human stomach as a reactor. Extra responsibilities included teaching and project management.
- SEPT 2017 – DEC 2017 | **Research Engineer** *Lindhurst Engineering Ltd.*  
→ This role involved monitoring and analysing (mass spectrometry) the biogas produced by an anaerobic digester system.
- FEB 2013 – SEP 2017 | **PhD researcher** *University of Nottingham*  
→ Thesis: *Techno-economic and carbon emission analysis of biogas utilisation systems in the UK.* My research focussed on developing an understanding of cost-benefits of biogas use with CHP and transport fuel.
- JAN 2011 – SEP 2012 | **Working Holiday** *Travelling Australia*  
→ I worked on a dairy farm and in restaurant to fund my travels, which included visiting the Komodo National Park in Indonesia to see Komodo Dragons.
- JUN 2010 – DEC 2010 | **R & D Engineer** *Cambridge Carbon Capture*  
→ Material characterisation using XRD and ICP-AES.  
→ Fuel cell (alkaline FC) design and testing.

## EDUCATION

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|-------------|--|---------------------------------|
| 2013 – 2017 | <b>Doctor of Philosophy, PhD</b><br>RENEWABLE ENERGY       | <i>University of Nottingham</i> |
| 2006 – 2010 | <b>Master of Engineering, MEng</b><br>CHEMICAL ENGINEERING | <i>University of Cambridge</i>  |
| 2000 – 2006 | <b>Advanced Highers</b><br>MATHS, PHYSICS, CHEMISTRY       | <i>Madras College</i>           |

## ATTRIBUTES

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### TECHNICAL KNOWLEDGE AND EXPERIENCE

- **Renewable energy technologies:** I have a range of knowledge and experience on renewable energy technologies, in particular biogas, fuel cells and CHP systems. I have worked on an AD system producing biogas from cow manure. I have worked with the Hydrogen refuelling station at the University of Nottingham that used an electrolyser to produce hydrogen.
- **Modelling and simulation:** I have constructed mathematical models for human digestion. I used mass balances, to construct partial differential equations and solved them using finite difference methods. I also completed the PSE training for gPROMS process modelling software.
- **Techno-economic and environmental analysis:** I carried out system and scenario modelling for biogas utilisation as well as constructing mass and energy transfer models for biogas upgrading membrane units. These models were used to carry out economic and carbon footprint investigations of biogas utilisation in the UK transport sector.
- **Data collection and monitoring:** I have monitored and analysed biogas samples from an active micro-AD plant and I also have experience of experimental design and data analysis of membrane gas separation. I have used a high pressure gas lines for setting up and monitoring solid state hydrogen storage.

### PROBLEM SOLVING

- **Practical:** When the fuel cell was on the Cambridge Carbon Capture project I came up with an effective solution, using a mesh to separate the anode and cathode while providing effective flow of electrolyte.
- **Theoretical:** During my research associate position I encountered a problem with solving nonlinear differential equations using standard methods. I dealt overcame this by researching alternative methods and found an applicable technique that I applied to the equations, which solved the equations.

### TEAMWORK

- **Versatility:** I have worked on a range of projects with people from varying socio-economic and cultural backgrounds. This has developed my ability to interact with colleagues to ensure both productive and enjoyable work environments are maintained.

### COMMUNICATION

- **Clear and concise:** I have given technical presentations at international conferences and written technical reports and my PhD thesis, which has improved my skill at conveying complex information in a clear and legible manner. I recognise that good communication is understanding the importance of the how the message will be received by the audience.

## PERSONAL

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British citizen || UK Driving Licence || Duke of Edinburgh Silver & Bronze Awards  
Hobbies; *Badminton, Photography & Cooking*

Referees available upon request.