



THE UNIVERSITY OF  
MELBOURNE

Melbourne  
Energy Institute

# Energy Systems Short Course

Course information  
28 June – 20 July 2023



# MEInetwork23: Energy Systems Short Course

Learn skills in analysing the financial, technical, and environmental performance of energy projects.

The Energy Systems Short Course teaches skills in energy investment decision making. The course centres on practical, hands-on modelling exercises. Participants develop their own spreadsheet models, and learn how to answer questions such as:

- Is a proposed wind farm or gas turbine a good investment?
- What is the probability that it will earn a commercial rate of return?
- What is the best financing structure for the project?
- How do you handle project risk and uncertainty?

## Topics covered

- The fundamentals of finance
- The Levelised Cost of Electricity (LCOE)
- Sensitivity analyses of financial investment models
- Tools for financial analysis under uncertainty
- Problem-based learning based on investment case studies

## Course delivery

All classes in the Energy Systems Short Course will be scheduled outside of business hours. Students are expected to attend in person at the University of Melbourne campus in Parkville, Victoria. Zoom links are available for those unable to attend onsite.

## Cost

Participation in the short course is free of charge for University of Melbourne graduate students, and is open to partner organisations and the public for a fee of \$5,000 (excluding GST) per place. A certificate of completion will be issued to participants with an attendance rate of 90% or higher.

## Location

Location, directions, and instructions for attending campus will be provided to successful candidates in the days preceding the course.

## How to apply

Applicants are invited to complete the form below before 11:59pm on 2 June 2023. Successful candidates will be notified via email.

[\*\*Apply now\*\*](#)

## Contact

For further information, please contact the Melbourne Energy Institute: [mei-info@unimelb.edu.au](mailto:mei-info@unimelb.edu.au)



# Course details

## Course outline of modules

**Module 1:** Introduction and basics of investment decision making and company financing

**Module 2:** Financing – capital, debt and equity, cost of capital, discounted free cash flow, NPV, and capital asset pricing model

**Module 3:** Investment analysis of electricity generation – renewable and fossil fuel technologies

**Module 4:** Unconventional natural gas extraction technology

**Module 5:** Financial analysis through Real Option Value (ROV)

Please note: Students are expected to attend in person. Zoom links are available for those unable to attend.

## Course schedule

Date/time	Topic
<b>Wednesday 28 June</b> 6:00pm - 9:00pm	<b>Module 1:</b> Introduction and basics of investment decision making and company financing
<b>Thursday 29 June</b> 6:00pm - 9:00pm	<b>Module 2:</b> Financing – capital, debt and equity, cost of capital, discounted free cash flow, NPV, capital asset pricing model
<b>Wednesday 5 July</b> 6:00pm - 9:00pm	<b>Module 3:</b> Investment analysis of electricity generation – renewable and fossil fuel technologies, Levelised Cost of Electricity (LCOE), effects of externalities, taxes, and incentives
<b>Thursday 6 July</b> 6:00pm - 9:00pm	<b>Module 3 (cont.):</b> Tutorial groups analysing different energy technologies
<b>Saturday 8 July</b> 9:00am - 12:00pm Lunch break 1:00pm - 4:00pm	<b>Module 3 (cont.):</b> Finalisation of analyses and group presentations <b>Module 4:</b> Unconventional natural gas extraction technology – basics
<b>Wednesday 12 July</b> 6:00pm - 9:00pm	<b>Module 4: (cont.)</b> Analysis of unconventional natural gas investment in USA and Australia
<b>Thursday 13 July</b> 6:00pm - 9:00pm	<b>Module 4 (cont.):</b> Unconventional natural gas extraction technology
<b>Saturday 15 July</b> 9:00am - 12:00pm Lunch break 1:00pm - 4:00pm	<b>Module 4 (cont.):</b> Finalisation and group presentations <b>Module 5:</b> Financial analysis through Real Option Value (ROV) – basics
<b>Wednesday 19 July</b> 6:00pm - 9:00pm	<b>Module 5 (cont.):</b> Analysis through ROV of future sustainable hydrogen production, including 'green' and 'blue' hydrogen
<b>Thursday 20 July</b> 6:00pm - 9:00pm	<b>Module 5 (cont.):</b> Finalisation and group presentations



# About the presenters



## Dr John Burgess

### Presenter and Convenor

**Dr. John Burgess** is a chemical engineer with extensive industrial and research experience. This includes a long and distinguished career at BHP, where he rose to senior executive level. He was also recently the Chair of the CSIRO Energy Advisory Committee for a number of years.

John is an Honorary Professorial Fellow at the University of Melbourne, an Adjunct Professor at the University of Queensland, and a Fellow of the Academy of Technological Sciences and Engineering (ATSE).

John has been teaching the MEInetwork21 Energy Systems Short Course since it began in 2018.



## Jonathan Anderson

### Co-convenor

**Mr. Jonathan Anderson** is a Sustainability Manager with Keolis Downer, and former Senior Engineer with international engineering consultancy Arup.

He has extensive experience across renewable energy generation and storage, water and wastewater management, mining, waste, agribusiness, freight and logistics, and process automation.

Jonathan was a student of the 2018 Energy Systems Short Course, and has assisted Dr. Burgess with teaching the course since 2020.





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#### **Contact us**

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