Master of Engineering (Sustainable Energy)

You’ll learn the technologies and practices to improve energy efficiency, and how to use renewable resources and reduce the environmental and social impacts of conventional energy technologies and resources.

Managing the transition towards a more sustainable energy sector is a priority for governments, the private sector and the general community.

As a result, the demand for engineers and scientists with a postgraduate qualification in sustainable energy is growing rapidly.

This program provides a pathway for engineers and scientists and those with an alternative acceptable qualification and significant industry experience.

Learning and teaching

An emphasis on ensuring graduates are work-ready means you’ll gain a solid understanding of not only the technical aspects of sustainable engineering but broader issues such as the economic, social and environmental context for sustainable energy.

Industry connections

Industry plays a vital role in the development, delivery and assessment of the program through the Program Advisory Committee, which include industry representatives, academic staff and alumni.

Some of the institutes, companies and industries that are contributing to the program through sharing their projects with our students or delivering expert lectures include:

- CSIRO
- DNV GL – Energy
- Melbourne Water
- Acciona Energy
- Moreland Energy Foundation
- Genesis Now.

Career outlook

Graduates are employed in local and international industries. They work on sustainable energy projects as energy managers, project managers and consultants.

Within their organisations, graduates take on lead roles in:

- developing and implementing plans to improve energy efficiency and productivity to cut fuel bills and reduce greenhouse gas/pollution emissions to meet regulatory requirements
- researching, developing, demonstrating, commercialising, designing and evaluating innovative solar, wind and hydro, biomass, hydrogen and other sustainable energy supply, storage and utilisation technologies
- devising innovative sustainable solutions to problems associated with adverse social and environmental problems linked to energy supply, distribution and consumption; and maintaining and optimising the performance of installed sustainable energy technologies and systems
- managing consultative processes with social groups affected by energy-related projects and developments.

Graduates have gone on to work at range of organisations including:

- Canadian Solar Inc.
- Honeywell
- Energy Australia Pty Ltd
- AGL Energy
- Origin Energy
- Genesis Now
- Stantec
- Schneider Electric
- T & O Energy Consulting Pty Ltd
- Acciona Energy
- DNV GL – Energy

Many graduates also go on to set up their own businesses and companies in the field of sustainable energy.
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Program structure

The Master consists of 192 credit points. This incorporates the Graduate Diploma (96 credit points).

In this program you’ll work on practical projects in a real or simulated work environment. You’ll then be assessed by, and receive feedback from, highly experienced academics and/or those involved in relevant industries.

The Masters Research Project course may incorporate WIL that can involve a private or public organisation. You’re also given opportunities to do minor research projects and case studies for selected courses within the program.

The program can be tailored to meet individual needs; case-study topics in a range of courses can be selected to suit your personal interests, as can the research project.

Year 1
Complete the following core courses:

Energy Efficiency and Demand Management
You will gain a practical understanding of the energy efficiency measures that can be implemented by large and medium industrial and commercial energy users and domestic users.

The Economic, Social and Environmental Context for Sustainable Energy
This course introduces you to the economic, social and environmental context that has led to the rapidly growing interest in sustainable energy, and within which decisions on the design and deployment of the associated technologies will be made.

Sustainable Energy Systems and Design
You will learn about the principles and practice of sustainable energy design to prepare you for the in-depth study of sustainable energy technologies covered later in the program.

Photovoltaic Systems
This course will provide you with an in-depth knowledge on theory and working principles of conventional and emerging solar photovoltaic (PV) technologies.

Electrical Energy Storage Systems
You will study conventional electrical energy systems and their applications in sustainable energy systems, including hydrogen systems, batteries and super-capacitors for sustainable stationary and mobile power supply applications.

Sustainable Thermal Systems
This course looks at a wide range of sustainable systems that utilise thermal energy, including solar energy utilisation and management for water and space heating and cooling systems, thermal management of buildings, geothermal, solar ponds, waste heat recovery, co-generation, and tri-generation systems.

And complete two electives:
- Sustainable Energy Fundamentals
- Biomass and Solar Fuels
- Wind and Hydro Power.

Year 2
Complete three elective courses (not previously completed):
- Sustainable Energy Fundamentals
- Biomass and Solar Fuels
- Wind and Hydro Power
- Building Quality Organisations
- Industrial Systems and Environment
- Vehicle Power-Train Technologies
- Management of Automotive Design and Development
- City Building and Urban Design Process
- Environmental Policy
- Natural Resource Management
- Electrical Energy Conversion
- Power System Analysis and Control.

And complete the following:
- Research Methods in Engineering.

Or complete the following two courses:
- Master’s Research Project Part 1
- Master’s Research Project Part 2.