



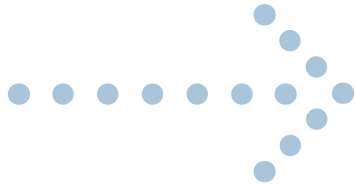
Clean Energy Council

Australian Renewable Energy Training and Workforce Strategy for 2020

Renewable Energy Training in Australia 2009



Hydro Tasmania



Foreword

In 2009, the Australian Government, through the Department of the Environment, Water, Heritage and the Arts (DEWHA), approved a grant to the Clean Energy Council, under the Low Emissions Technology Abatement (LETA) – Renewables program, to develop an Australian Renewable Energy Training and Workforce Strategy (RETWS).

The Clean Energy Council, as the project manager, engaged two consultancy firms, Global Sustainable Energy Solutions Pty Ltd and IT Power Australia, to undertake the detailed research and develop the project documents in consultation with the Council and its members.

This work seeks to provide guidance and strategies to ensure that the skills and workforce requirements of the renewable energy industry can be met from now to 2020.

The RETWS consists of three reports which draw attention to the workforce and training gaps within each state of Australia and recommends possible solutions to ensure a strong and sustainable renewable energy workforce.

The Clean Energy Council acknowledges the work of the project consultants who have undertaken detailed research, analysis and consultation with industry, the tertiary sector and other stakeholders to develop the reports. It also acknowledges the assistance of a number of its members and other industry stakeholders who have provided in-kind participation and contributions to this project.



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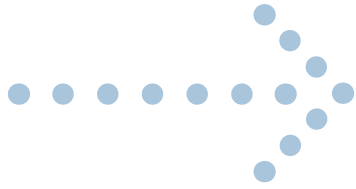
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Australian Renewable Energy Training and Workforce Strategy for 2020
Renewable Energy Training in Australia 2009

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Overview

In October 2007, Kevin Rudd announced that if Labor were to be elected it would commit to a renewable energy (RE) target of 20% by the year 2020. For the Labor Government to fulfil this commitment, Australia needs to grow its renewable energy industry.

Renewable energy is an essential part of Australia's low emissions energy mix and is integral to reducing the country's greenhouse gas emissions. Although Australia's renewable energy industry is rapidly expanding in line with the government's commitment of 20% by 2020, it needs to be able to sustain this growth. Sustained and continuous growth can only be achieved with the support of a skilled workforce.

In March this year, the Clean Energy Council, with the support of funding from the Department of the Environment, Water, Heritage and the Arts (DEWHA), initiated a project to develop an **Australian Renewable Energy Training and Workforce Strategy (RETWS) for 2020**. The objective of this strategy is to ensure that the workforce requirements of Australia's renewable energy industry can be met now and into the future. Further, this strategy aims to influence the availability and accessibility of appropriate training to ensure Australia has the capacity to manage the renewable energy industry's future workforce needs.

As the Clean Energy Council represents all stationary energy, this project has focused on renewable resources contributing to electricity generation. The key sectors examined are:

- Grid-connected solar photovoltaics
- Off-grid solar photovoltaics
- Wind power
- Bioenergy
- Solar water heaters
- Solar thermal electric systems

The project has not considered transport fuel, generation of thermal energy or energy efficiency, unless there are overlapping applications.

The first step in developing the RETWS was to commission research into the Australian renewable energy sector to understand current employment figures, what training is available, and what training will be needed in future to build a skilled workforce.

Summary of research findings

In May this year, a comprehensive survey of renewable energy industries and system installers was conducted to ascertain the current skills base and the future training requirements of an expanding renewable energy industry.

Key messages from the survey included:

- Too few undergraduate courses that cover renewable energy technologies are currently available.
- There is a specific need for flexible or e-delivery of accredited courses through universities, such as distance education where course units can be used toward a diploma or Masters degree.
- Too few local TAFE colleges are currently offering courses on renewable energy.
- There is no management training for technical staff.
- More qualified trainers are needed.

Specific numbers show:

- 26 Technical and Further Education institutes (TAFEs) and private Registered Training Organisations (RTOs) currently offer or will soon offer accredited qualifications, courses or units of competency in renewable energy.
- 11 universities offer coursework-based degrees in renewable energy.
- 18 universities offer research degrees in renewable energy.
- There are currently an estimated 10,370 employees in the renewable energy industry.
- Conservative projections show that these employment numbers need to more than double over the next decade, with an estimated 24,000 to 30,000 jobs required by 2020. If the growth experienced by the industry over the last few years continues, the total number of people estimated to be employed by the industry in 2020 could be over 30,000.

Within the industry:

- Many companies are offering internal training and/or product training.
- Industry associations are offering professional development days.
- Some associations are conducting 'green' training which brands (or certifies) those undertaking the courses (e.g. EcoSmart Electricians and National Plumbers Association.)

RETWS reports

The strategy and the research supporting it have been documented in three reports.

Report 1: Renewable Energy Training in Australia 2009

This report documents and assesses the training courses currently available to the industry at universities, TAFEs, registered training organisations and within industry.

Report 2: Renewable Energy Jobs in 2009 and Forecasts to 2020

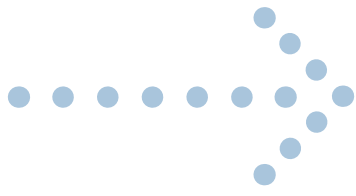
This report documents the results of the industry survey conducted to quantify employment numbers across the renewable energy industry. It also includes conservative estimates of employment demand of the industry to 2020.

Report 3: Strategies for Six Technologies – What we need to do today

This report combines the results of the industry survey with a review of renewable energy training offered throughout Australia. It provides an assessment of predicted growth to provide a summary of skills and training likely to be needed in the stationary renewable energy sector over the next decade. Specific training requirements are discussed in relation to the six technologies listed earlier. The report also identifies what training resources will be required, including trainers, teaching material and training facilities.

Note that Report 3 may not contain a complete list of the courses offered by education institutions, particularly where these cover a broader range of technologies than the six targeted. For more information regarding the full range of available courses and current employment, please refer to Reports 1 and 2 respectively.

There is a range of private training colleges that offer different aspects of renewable energy training. Their courses have not been included in these reports and their involvement in future training efforts has not been specifically discussed because they tend to offer courses on an opportunistic basis and do not have a long-term established workforce or curriculum structure. Nevertheless, the general recommendations regarding skills development and training needs would encompass their activities.



1. Summary of training courses in Australia

The following summary provides information on training courses conducted by:

- TAFE institutions and private registered training organisations (RTOs)
- Universities
- Industry-based training

The report identifies that there are:

- 26 TAFEs and private RTOs currently offering or soon to offer accredited qualifications, courses or units of competency (UoC) in renewable energy
- 11 universities offering coursework-based degrees in renewable energy
- 18 universities offering research degrees in renewable energy
- Within the industry there are many companies offering internal training and/or product training, industry associations offering professional development days and some associations conducting training which 'brand' those who undertake the courses (e.g. Ecosmart electricians).

1.1 TAFE and private RTO training

There is at least one TAFE conducting accredited qualifications, courses or UoC in renewable energy in each state except Tasmania.

Table 1 below breaks down the numbers around higher qualifications, such as Cert IV, Diploma and Advanced Diploma.

Table 1. TAFEs by state that offer higher qualifications

Qualification	State	Number of TAFEs that offer/ will offer qualification
UEE41907 Cert IV Electrical – Renewable Energy	Vic	3
	WA	1
	Qld	1
	NSW	1
UEE42009 Cert IV Electrical – Photovoltaic Systems	Qld	2
UEE41607 Cert IV Renewable Energy	Qld	1
	ACT	1
	Vic	4
UEE61007 Advanced Diploma Renewable Energy	Vic	1
	WA	1
	NSW	1
UEE50707 Diploma Renewable Energy	Qld	2
	Vic	1
WT12 Diploma of Renewable Energy	WA	1
UTE41301 Cert IV Electrotechnology (Renewable Energy)	NSW	2
	SA	1
	Vic	3
UTE50601 Diploma of Electrotechnology (Renewable Energy)	Vic	2
UEE61307 Advanced Diploma in Electrical – Technology (Renewable Energy)	Vic	1

While all states except Tasmania and the Northern Territory are represented in this table, it is clear that some states, such as New South Wales and South Australia, have fewer higher qualifications available.

There has also been a trend in recent years toward offering short courses with specific UoC in order to complete requirements for Clean Energy Council accreditation for design and installation of grid-connect (GC) and stand-alone (SA) power systems. The accredited qualifications, courses and units of competency currently offered or soon to be offered by TAFEs and private RTOs across the country are listed in Table 2 below.

Table 2. Qualifications, short courses and UoC offered or soon to be offered by TAFEs and private RTOs

Code	Name	Offered by
Qualifications – Current Training Package		
UEE41907	Cert IV Electrical – Renewable Energy	RMIT TAFE, NMIT TAFE, Mount Druitt TAFE, Central TAFE (proposed), Gordon TAFE (proposed), Sunshine Coast TAFE (proposed)
UEE42009	Cert IV Electrical – Photovoltaic Systems (not yet released)	Careers Australia Institute of Training (proposed), SkillsTech Australia TAFE (proposed)
UEE41607	Cert IV Renewable Energy	Sunshine Coast TAFE, Canberra Institute of Technology TAFE, Chisholm Institute, NMIT TAFE, Swinburne TAFE, Mount Druitt TAFE (proposed), Bendigo TAFE (proposed)
UEE32007	Cert III Renewable Energy ELV	NMIT TAFE
UEE21507	Cert II Renewable Energy	Hornsby TAFE, South Western Sydney Institute of TAFE, TAFE NSW Western Institute, Swinburne TAFE, Central TAFE (proposed), Mount Druitt TAFE, Albury TAFE (proposed), Port Macquarie TAFE (proposed), Careers Australia Institute of Training (proposed), Sunshine Coast TAFE (proposed), SkillsTech Australia TAFE (proposed), NMIT TAFE (proposed)
UEE22107	Cert II Sustainable Energy (Career Start)	Catholic Education Office (Lismore), Sunshine Coast TAFE (proposed)
UEE21407	Cert II Remote Area Power	Centre for Appropriate Technology (proposed)
UEE61007	Advanced Diploma Renewable Energy	NMIT TAFE, Mount Druitt TAFE, Central TAFE (proposed)
UEE50707	Diploma Renewable Energy Engineering	NMIT TAFE, Careers Australia Institute of Training (proposed), SkillsTech Australia (proposed)
UEE61307	Advanced Diploma in Electrical – Technology (Renewable Energy)	Swinburne TAFE (proposed)
Qualifications – Previous Training Package		
WS97	Cert III in Electrotechnology (Renewable Energy)	Central TAFE
WT12	Diploma of Renewable Energy	Central TAFE
UTE41301	Cert IV Electrotechnology (Renewable Energy)	Muswellbrook TAFE, Regency Park TAFE, Chisholm Institute, Swinburne TAFE, Gordon TAFE, Mount Druitt TAFE (proposed)
UTE50601	Diploma of Electrotechnology (Renewable Energy)	Chisholm Institute, Swinburne TAFE
Short courses		
26847	Grid-connect – Design and Install – TAFE plus	Mount Druitt TAFE
SA-FE04	Renewable Energy Technologies – Statement of Attainment	Canberra Institute of Technology TAFE
SA-FE05	Stand-alone Renewable Energy Systems – Statement of Attainment	Canberra Institute of Technology TAFE
	Fundamentals of Renewable Energy Technologies	Regency Park TAFE
9974	Renewable Energy – TAFE Statement	Mount Druitt TAFE, South Western Sydney Institute of TAFE

SET056	Grid-connect Design and Accreditation for Electricians	NMIT TAFE
21596VIC	Green Plumbers	Master Plumbers & Mechanical Services Association of Australia
91276NSW	Renewable Energy on Farm – Application	Western NSW TAFE
Units of competency		
UEENEEK025B	Solve Basic Problems in Photovoltaic Energy Apparatus	Global Sustainable Energy Solutions (GSES), Bendigo TAFE, Swinburne TAFE, SkillsTech Australia (proposed)
UEENEEK026B	Install and set up grid-connected (GC) photovoltaic systems	GSES, Bendigo TAFE, Swinburne TAFE, SkillsTech Australia (proposed)
UEENEEK035B	Design Grid-connected Power Systems	GSES, Bendigo TAFE, Swinburne TAFE, SkillsTech Australia (proposed)
NUER15	Photovoltaic Installations	Gordon TAFE, Central TAFE ³
NUER19	Grid-connect Inverter Systems	Gordon TAFE, Central TAFE ⁴

The current Electro-Technology (EE-OZ) training package was only endorsed in 2008; therefore a number of the TAFE colleges are in transition from the old training package to the new one (as evident in Table 1). Within the new training package there are 45 UoC relating to renewable energy and energy efficiency. Behind these UoC are 28 Essential Knowledge and Skills (EKAS), which identify the knowledge and skills obtained by students when they undertake specific UoC.

These are listed in Appendix A – Units of competency (UoC) and Appendix B – Essential Knowledge and Skills (EKAS).

Individual TAFE colleges and private RTOs were asked to complete the survey. The results of these surveys are contained in Appendix C – TAFE and private RTO training, which provides further detail on each of the TAFE colleges and private RTOs offering renewable energy qualifications and short courses.

1.2 University training

There are currently 11 universities that provide coursework-based degrees in renewable or sustainable energy. Most of these universities offer both undergraduate and postgraduate options. Hence there are nine undergraduate degrees and 20 postgraduate coursework-based degrees.

The coursework-based degrees offered by universities are listed in Table 3 below.

Table 3. Coursework-based degrees offered by universities

University	Level of Award
Australian National University	Bachelor of Engineering (sustainable energy systems major) – undergraduate degree
	Master of Engineering (Solar Energy) – higher degree by coursework
Curtin University of Technology	Master of Engineering Science (Renewable Energy Electrical Power Systems) – higher degree by coursework
Griffith University	Bachelor of Engineering (sustainable energy systems) – undergraduate degree
Murdoch University	Postgraduate Certificate in Energy Studies – higher degree by coursework
	Postgraduate Diploma in Energy Studies – higher degree by coursework
	Master of Science in Renewable Energy – higher degree by coursework
	Bachelor of Engineering (Renewable Energy Engineering) – undergraduate degree
	Bachelor of Science in Sustainable Energy Management – undergraduate degree
RMIT University	Graduate Certificate in Sustainable Energy – higher degree by coursework
	Graduate Diploma of Sustainable Energy – higher degree by coursework
	Masters of Engineering (Sustainable Energy) – higher degree by coursework
	Graduate Certificate in Sustainable Practice – higher degree by coursework

³ Content meets this competency and has Clean Energy Council approval.

⁴ Content meets this competency and has Clean Energy Council approval.

	Graduate Diploma of Sustainable Practice – higher degree by coursework
	Masters of Engineering (Sustainable Practice) – higher degree by coursework
University of Adelaide	Bachelor of Engineering in Sustainable Energy Engineering – undergraduate degree
University of Melbourne	Graduate Diploma in Engineering (Energy Engineering) – higher degree by coursework
	Master of Energy Studies – higher degree by coursework
	Master of Engineering Science (Energy Studies) – higher degree by coursework
University of New South Wales	Graduate Certificate of Engineering Science (Photovoltaics and Solar Energy) – higher degree by coursework
	Graduate Diploma of Engineering Science (Photovoltaics and Solar Energy) – higher degree by coursework
	Master of Engineering Science (Photovoltaics and Solar Energy) – higher degree by coursework
	Master of Engineering Science (Extension) (Photovoltaics and Solar Energy) – higher degree by coursework
	Bachelor of Engineering (Photovoltaics and Solar Energy) – undergraduate degree
	Bachelor of Engineering (Renewable Energy) – undergraduate degree
University of South Australia	Bachelor of Engineering (Mechanical and Sustainable Systems) – undergraduate degree
	Graduate Certificate in Engineering (Energy Management) – higher degree by coursework
University of Tasmania	Graduate Certificate in Renewable Energy Power Systems – higher degree by coursework
Edith Cowan University	Bachelor of Engineering (Electrical Power)

There are 18 universities offering research degrees in renewable energy. Table 4 lists these research degrees, and their major areas of research.

Table 4. Research degrees offered by universities

University	Major Areas of Research	Award
Australian National University	Photovoltaics, Solar Thermal	MPhil, PhD
Curtin University of Technology	Distributed Generation, Wind, Fuel Cells	MPhil, PhD
Murdoch University	RAPS Systems, Photovoltaics, Small Wind Turbines, Sustainable Transport, Fuel Cells	MPhil, PhD
RMIT University	Hydrogen Systems for RAPS, Fuel Cells, Solar Thermal	MEng, PhD
University of Adelaide	Geothermal, Wind, Wave, Solar	MPhil, PhD
University of Melbourne	Hybrid Electric Vehicles, Energy Studies in Rural Development	MEng, PhD
University of New South Wales	Photovoltaics, Electrical Energy Storage, Hybrid Systems, Grid-connected Systems, Solar Thermal	MEng, PhD
University of Newcastle	Small horizontal axis wind turbines	MEng, PhD
University of South Australia	Solar Thermal, Thermal Energy Storage, Alternative Fuels and Vehicles, Wind, Water	MEng, PhD
University of Sydney	Energy Storage, Fuel Cells, Distributed Generation	MEng, MPhil, PhD
University of Tasmania	Distributed Generation, Energy Storage Systems, RAPS, Hybrid Systems, Micro-grids and Smart-grids, Wind and Hydro	MESc, PhD
Monash University	Bioenergy Gasification, Biofuels, Biodiesel, Solar Systems Integration, Dye-sensitised Solar Cells	MESc, PhD
Queensland University of Technology	Energy Storage, Solar Thermal, Biofuels	MEng, PhD
University of Queensland	Geothermal Energy, Bagasse, Biodiesel, Bioreactor Landfill, Methanol, Municipal Solid Waste, Sludge	MPhil, PhD
University of Western Australia	Photovoltaics	MESc, PhD
University of Southern Queensland	Solar Thermal, Photovoltaics, Wind, Hydrogen, Fuel Cells, Wave, Micro-hydro systems, Heat Pumps	MEng, PhD
University of Technology Sydney	Wave, Wind, Solar	MEng, PhD
University of Wollongong	Bioenergy, Wave, Small Wind, Distributed Generation, Fuel Cells, Organic Photovoltaics, Ultracapacitors	MEng, PhD

Research degrees offered by universities

The information in Table 3 Coursework-based degrees offered by universities and Table 4 Research degrees offered by universities was compiled from internet research. Appendix D – University Training provides further detail on each of the universities offering renewable energy qualifications.

1.3 Industry-based training

A survey of the renewable energy industry was conducted and the results were used to develop the following documents:

- Renewable Energy Jobs 2009 and Forecasts to 2020
- Australia Renewable Energy Training and Workforce Strategy for 2020

The survey includes questions relating to existing industry training.

Historically manufacturers, product importers and larger wholesalers have provided training to their dealers who buy, sell and then install their products. The individuals who attend these training courses will typically be provided a certificate of attendance. However, they receive no formal qualification, with the exception of some companies possibly being appointed as service agents that can undertake repairs of a particular product or products.

Table 5 lists companies identified who conduct in-house training courses.

Table 5. Companies offering in-house training courses

BP Solar Pty Ltd	Conergy Pty Ltd
Grundfos Pty Ltd	Latronics
Mono Pumps Pty Ltd	Selectronics
Air Solar Australia	Kyocera Solar
Apollo Energy Pty Ltd	LJW Solar Pty Limited
Artemis Building Systems	MGF Consultants (NQ)
Beyond Building	Origin
Cambridge Electric Company	Ozone Design Pty Ltd
Clear Solar	R&K Electrics Pty Ltd
Diamond Energy	Rivers Electrical
Eastland Energy	Rural Solar
Ergon Energy/Australian Sustainable Energy Services	Sammon Electrical Pty Ltd
Fieldforce Services Pty Ltd	SolarPower
Hansen Electric	Springers Low Voltage Specialists
Hills Solar	Sungrid Ltd
Honda MPE Pty Ltd	Total Water Solutions

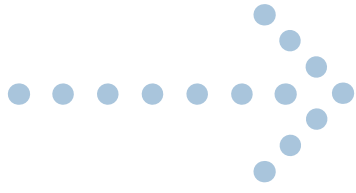
The Clean Energy Council – which administers the accreditation program for designers and installers of grid-connect and stand-alone power systems – regularly conducts professional development days for the industry. These professional development days are conducted with the support of the Research Institute of Sustainable Energy (RISE) and typically relate to the Australian standards and new technical issues within the industry.

The National Electrical Contractors Association (NECA) commenced its EcoSmart Electricians program in 2007. Members attend a 2.5 day course, which includes sessions on energy efficiency, HVAC, lighting and solar power. At the conclusion of the course, those who attended are able to promote themselves as EcoSmart electricians.



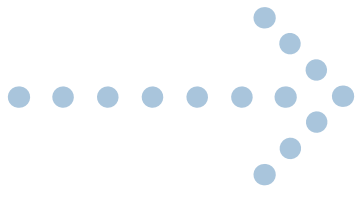
Annex A. Units of Competency

UEENEEK001B	Maintain safety and tidiness of remote area power supply (RAPS) systems
UEENEEK002B	Work safely with remote area power supply (RAPS) systems
UEENEEK003B	Conduct periodic maintenance of remote area power supply (RAPS) battery banks
UEENEEK004B	Conduct periodic maintenance of remote area power supply (RAPS) generator sets
UEENEEK005B	Conduct periodic maintenance of remote area power supply (RAPS) photovoltaic arrays
UEENEEK006B	Conduct periodic maintenance of remote area power supply (RAPS) wind generators
UEENEEK007B	Conduct checks in the demand side use of remote area power supplies
UEENEEK008B	Plan periodic maintenance schedules of remote area power supplies
UEENEEK009B	Attend to breakdowns in remote area power supplies
UEENEEK010B	Co-ordinate maintenance of renewable energy apparatus and systems
UEENEEK011B	Assemble and connect remote area power supplies (RAPS)
UEENEEK012B	Provide basic sustainable energy solutions for energy reduction in domestic premises
UEENEEK013B	Apply sustainable energy practice in daily activities
UEENEEK014B	Promote sustainable energy practice in the community
UEENEEK015B	Verify compliance and functionality of renewable energy installations
UEENEEK017B	Maintain and repair facilities associated with remote area essential service operations
UEENEEK018B	Maintain operation of remote area water facilities
UEENEEK019B	Maintain operation of remote area waste water facilities
UEENEEK020B	Maintain operation of remote area power plant
UEENEEK021B	Manage renewable energy projects
UEENEEK022B	Plan renewable energy projects
UEENEEK023B	Carry out basic repairs to renewable energy apparatus by replacement of components
UEENEEK024B	Assemble and set up photovoltaic apparatus in domestic dwellings
UEENEEK025B	Solve basic problems in photovoltaic energy apparatus
UEENEEK026B	Install and set up grid-connected photovoltaic power systems
UEENEEK027B	Diagnose faults in renewable energy control systems
UEENEEK028B	Solve basic problems in stand-alone renewable energy systems
UEENEEK029B	Design renewable energy heating systems
UEENEEK030B	Solve basic problems in wind energy conversion systems
UEENEEK031B	Design wind energy conversion systems rated to 10 kW
UEENEEK032B	Develop strategies to address sustainability issues
UEENEEK033B	Design hybrid power systems
UEENEEK034B	Install stand-alone photovoltaic power systems
UEENEEK035B	Design grid-connected power supply systems
UEENEEK036B	Prepare grid-connected photovoltaic power systems for LV connection
UEENEEK037B	Install and set up micro-hydro systems
UEENEEK038B	Design micro-hydro systems
UEENEEK039B	Design stand-alone renewable energy systems
UEENEEK040B	Develop engineering solutions to renewable energy problems
UEENEEK041B	Develop strategies for effective energy reduction in buildings
UEENEEK042A	Participate in environmentally sustainable work practices
UEENEEK043A	Install small wind energy conversion systems for stand-alone applications
UEENEEK045A	Implement and monitor, policies and procedures for environmentally sustainable electrotech work practice
UEENEEK046A	Design energy management controls for electrical installations in buildings



Annex B. Essential knowledge and skills

- 2.20 Sustainable energy and environment
 - 2.20.1 Sustainable energy principles
 - 2.20.2 Environmental and heritage awareness
 - 2.20.3 Introduction to renewable energy technologies
 - 2.20.4 Greenhouse reduction strategies
 - 2.20.5 Remote area essential services facilities
 - 2.20.6 Remote area essential services power plant
 - 2.20.7 Remote area essential services waste water facilities
 - 2.20.8 Remote area essential services water facilities
 - 2.20.9.1 Stand-alone renewable energy system components
 - 2.20.9.2 Stand alone renewable energy system design consideration
 - 2.20.10 Hybrid energy systems
 - 2.20.11 Sustainability and greenhouse reduction strategies
 - 2.20.12 Energy-efficient building design
 - 2.20.13 Photovoltaic installations
 - 2.20.14 Photovoltaic power systems
 - 2.20.15 Renewable energy system electronics
 - 2.20.16.1 Fundamentals of wind energy conversion
 - 2.20.16.2 Wind energy conversion systems
 - 2.20.17.1 Micro-hydro systems installation and maintenance processes
 - 2.20.17.2 Micro-hydro systems
 - 2.20.18 Solar water heating systems
 - 2.20.19 Grid-connected inverters
 - 2.20.20 Renewable energy heating
 - 2.20.21 Distributed generation



Annex C. TAFE and private RTO training

TAFE/RTO

Hunter TAFE

Location

Fifteen campuses – relevant campuses are Muswellbrook and Newcastle, NSW

Contact person and details

Gary Brooker

Email: gary.brooker@tafensw.edu.au

Phone: +61 2 6542 1112

Name of qualifications/courses/units offered

UTE41301

Hunter TAFE will commence short course in grid-connected design and install in 2009.

Muswellbrook TAFE will commence teaching UEE41907 in 2009.

Target audience

Mainly mature age students

Number of students previously/currently enrolled

35–40/15

Method of study

Blended model – mostly correspondence and online, with a practical session every four to six weeks

Year of establishment of course

2008

Number of qualified trainers

One full-time and one part-time trainer

Other relevant information

Will be building mock roofs for install practice soon.

TAFE/RTO

Mount Druitt TAFE

Location

Mount Druitt, NSW

Contact person and details

Vince Blanko

Phone: +61 2 9208 6293

Name of qualifications/courses/units offered

UEE41907

UEE21507

UEE61007

26847 Grid-connect Design and Install – TAFE plus

9974 Renewable Energy – TAFE Statement

UEE41607 is under consideration.

Target audience

- Mature age students e.g. looking for career change
- Electricians looking to upskill

Frequency of offering

- TAFE plus – on demand

Number of students previously/currently enrolled

Approximately 40 students are currently enrolled. Twelve to 14 students attend each grid-connect (GC) course.

Method of study

Qualifications – part-time, full-time, day and evening

grid-connect (GC)/standalone (SA) course – mixed mode, four to five days face to face, remainder distance

Year of establishment of course

- Old training package 2008 (including GC/SA)
- New training package 2009

Number of qualified trainers

Four

Other relevant information

- Adequate facilities including 3 kW grid-connect system, wind, hydro, test equipment, stand-alone (SA) system

TAFE/RTO

Albury TAFE

Location

Albury, NSW

Contact person and details

Jaimie Carey

Email: jaimie.carey@det.nsw.edu.au

Name of qualifications/courses/units offered (Note: From NTIS website)

UEE21507

TAFE/RTO

Hornsby TAFE

Location

Hornsby, NSW

Contact person and details

Kevin Inskip

Phone: +61 2 9472 1274

Name of qualifications/courses/units offered

UEE21507

Target audience

Members of solar PV industry, and qualified tradespeople looking to upskill

Frequency of offering

Once a year

Number of students previously/currently enrolled

0/12

Method of study

Face to face — one night a week for electricians, two nights a week for non-electricians

Year of establishment of course

2009

Number of qualified trainers

One part-time trainer with three more in training

Other relevant information

- Looking to get more equipment soon, particularly a mobile training station
- Course initially received many enquiries

TAFE/RTO

Port Macquarie TAFE

Location

Port Macquarie, NSW

Contact person and details

Rex Davies

Phone: +61 2 6581 6305

Email: rex.davies@tafensw.edu.au

Name of qualifications/courses/units offered (Note: from NTIS website)

UEE21507

TAFE/RTO

Catholic Education Office (Lismore Office)

Location

Lismore, NSW

Contact person and details

Email: director@lism.catholic.edu.au

Name of qualifications/courses/units offered (Note: from NTIS website)

UEE21507

TAFE/RTO

Careers Australia Institute of Training

Location

Bowen Hills, Queensland

Facilities in New South Wales (Newcastle/Hunter region), ACT and Victoria (Melbourne metro area) planned for late 2009

Contact person and details

Phil

Phone: 0409 769 244

Name of qualifications/courses/units offered

UEE32007, UEE 50707 will be offered in May 2009 on completion of Bowen Hills training centre

UEE21507 will be offered when application approved

UEE42009 will be offered once accepted by EEOz

Target audience

UEE21507 targeting school leavers

Method of study

Either face to face part-time or online delivery

Number of qualified trainers

Three

Other relevant information

- In the process of building a new training centre with wind, hydro and solar facilities
 - Perceive that there is little training in renewable energy conducted at present, and attempting to be proactive in providing training to meet future market
-

TAFE/RTO

Global Sustainable Energy Solutions (GSES)

Location

Pambula, NSW

Contact person and details

Belinda McLean

Phone: 0408 120 007

Email: belinda@gses.com.au

Name of qualifications/courses/units offered

UEENEEK024B

UEENEEK025B

UEENEEK026B

UEENEEK035B

Target audience

Electricians seeking to upskill and GC design and install accreditation

Frequency of offering

Online – constantly

Practical – approximately once a month

Number of students previously/currently enrolled

Thirty-four have completed the course, 56 are currently enrolled

Method of study

Online theory followed by practical component

Year of establishment of course

2008

Number of qualified trainers

Three

Other relevant information

- Have training facility in Pambula for install practice for grid-connect systems (mock roofs etc.). This will be expanded in future to incorporate other technologies like wind, hydro.
- Course costs are \$2,700, which include online course and three days practical training.

TAFE/RTO

Sunshine Coast TAFE

Location

Five campuses, Queensland

Contact person and details

Mark Riley

Phone: +61 7 5459 3789

Name of qualifications/courses/units offered

UEE41607

UEE61007

UEE41907 will be offered at the start of 2010.

UEE21507 will be offered at the start of 2010.

UEE22107 will be offered in the middle of 2010.

Target audience

Mature age students looking to retrain

Frequency of offering

One per year

Number of students previously/currently enrolled

0/8 (UEE41907) – 13 (UEE61007)

Method of study

Face to face part-time

UEE21507 will be run one day per week for Years 11 and 12 students.

Year of establishment of course

UEE41607 – 2009

UEE61007 – 2009

Number of qualified trainers

Two full-time, four part-time

Other relevant information

- Need more resources, particularly grid-connect inverters
-

TAFE/RTO

South West Sydney TAFE

Location

Nine campuses – relevant campus is Granville, NSW

Contact person and details

Ian Daton

Phone: +61 2 9682 0241

Peter Lema

Phone: +61 2 9760 6825

Email: peter.lema@tafensw.edu.au

Name of qualifications/courses/units offered

UEE21507

TAFE/RTO

TAFE NSW Western Institute

Location

Twenty-four campuses, five with electrical facilities.

Orange will receive training first, hopefully followed by other campuses.

Contact person and details

Sandra Gray

Phone: +61 2 6391 4005

Email: sandra.gray@tafensw.edu.au

Name of qualifications/courses/units offered

91276NSW

UEE21507 will be offered in mid 2009.

Target audience

UEE 21507 – Electricians seeking to get SPS accreditation

Frequency of offering

91276NSW – whenever required

Number of students previously/currently enrolled

UEE 21507 – 0/approximately 20

Method of study

UEE 21507 – Blended model – some face to face, some online

Year of establishment of course

91276NSW – 2007

Number of qualified trainers

Three

Other relevant information

- Intend to set up a mobile training station which can then used to teach at all campuses
- Planning to set up demonstration centre and have applied for funding from Department of Climate Change

TAFE/RTO

Master Plumbers and Mechanical Services Association of Australia (MPMSAA)

Location

Training centres in Melbourne, Victoria, and Brisbane, Queensland, but have conducted training throughout Australia

Contact person and details

Gary Workman

Phone: +61 2 6391 4005

Email: gary.workman@mpmsaa.org.au

Name of qualifications/courses/units offered

21596VIC

Target audience

Licensed plumbers

Frequency of offering

Whenever required

Number of students previously/currently enrolled

7,400 certificates (for individual units) issued to date

Method of study

Blended model – evening sessions, some units (including Solar Water Heating) online

Year of establishment of course

2001

Other relevant information

- Units can be studied separately to the course. SWH is by far the most popular unit in this course.

TAFE/RTO

SkillsTech Australia TAFE

Location

Brisbane, Queensland

Contact person and details

Richard

Phone: +61 7 3258 5942

Name of qualifications/courses/units offered

Currently running GC competencies from old training package

UEE42009 will be offered in mid 2009.

UEE21507 is under consideration.

UEE50707 is under consideration.

Number of students previously/currently enrolled

Approximately 200 students have completed GC competencies.

Method of study

Blended model – combination of distance, face to face and practical

Year of establishment of course

2007

Number of qualified trainers

Three

Other relevant information

Have adequate resources for grid-connect and stand-alone (SA) solar PV, but not wind and hydro

TAFE/RTO

Canberra Institute of Technology TAFE

Location

Canberra, ACT

Contact person and details

Kelvin Martin

Phone: +61 2 6205 4221

Email: kelvin.martin@cit.act.edu.au

Russell Seberry

Phone: 0419 601 749

Name of qualifications/courses/units offered (Note: from Canberra Institute of Technology TAFE website)UEE41607

TAFE/RTO

Regency Park TAFE

Location

Regency Park, South Australia

Contact person and details

Kennedy Mavunganidze

Phone: +61 3 8348 2411

Email: kennedy.mavunganidze@tafesa.edu.au

Aussie Kanck

Email: aussie.kanck@tafesa.edu.au

Name of qualifications/courses/units offered (Note: from NTIS website)UTE41301 Fundamentals of Renewable Energy Technologies

TAFE/RTO

Bendigo TAFE

Location

Seven campuses in regional Victoria

Contact person and details

Ken Meehan

Phone: +61 3 5434 1761 or 0423 845 019

Name of qualifications/courses/units offered

Currently offering GC competencies.

UEE41607 will be offered in late 2009.

Frequency of offering

UEE41607 – two per year

Method of study

Part-time – day and evening classes

Year of establishment of courseGC course – 2008

TAFE/RTO

Chisholm Institute

Location

Nine campuses, Melbourne, Victoria

Contact person and details

John Flanders

Phone: 0423 055 745

Email: john.flanders@chisholm.vic.edu.au

Name of qualifications/courses/units offered (Note: from NTIS, Chisholm TAFE and BCSE website)

UEE41607

UTE41301

UTE50601

UEE50107

GC competencies

TAFE/RTO

RMIT TAFE

Location

Melbourne, Victoria

Contact person and details

William Lau

Phone: +61 3 9925 4703

Email: william.lau@rmit.edu.au

Name of qualifications/courses/units offered (Note: from NTIS website)

UEE41907

TAFE/RTO

NMIT TAFE

Location

Melbourne, Victoria

Contact person and details

Peter Averill

Phone: +61 3 9269 1052

Email: peteraverill@nmit.vic.edu.au

Name of qualifications/courses/units offered

UEE41907

UEE41607

UEE32007

Short course in GC competencies.

Target audience

Mainly mature age – either qualified tradespeople looking to upskill or looking for a career change

Frequency of offering

GC course – approximately one per month

Number of students previously/currently enrolled

UEE41907, UEE41607, UEE32007 – 40 full-time, 40 part-time currently enrolled

GC short course – 200 completed

Method of study

UEE41907, UEE41607, UEE32007 – full-time, part-time, day and evening options

GC short course – seven days face to face

Year of establishment of course

1996 (under different training package)

Number of qualified trainers

Three full-time, numerous part-time

Other relevant information

Have built a new facility with grid-connect systems, wind, hot water, stand-alone and dedicated classrooms and workshop

TAFE/RTO

Sunraysia TAFE

Location

Four campuses in Victoria – relevant campus Mildura

Contact person and details

Steve Glasson

Email: sglasson@sunitafe.edu.au

Name of qualifications/courses/units offered

UEE21507 will be offered April 2009.

Frequency of offering

Planning for two per year

Method of study

Part-time, face to face

Other relevant information

Facilities are good.

TAFE/RTO

Swinburne TAFE

Location

Seven campuses

Contact person and details

John Morris

Phone: 0416 163 835

Greg Powley

Phone: +61 3 9210 1210

Name of qualifications/courses/units offered

UEE41607

UTE41301

UTE50601

Short course in GC competencies

UEE61307 will be offered in late 2009

Target audience

School leavers and adult learners retraining/upskilling

Frequency of offering

GC short course – whenever required

UEE42607 rolling enrolments

UEE61307 two enrolments per year

Method of study

GC short course – blended model (some face to face, some practical, some distance)

UEE41607, UEE61307 full-time and part-time

Year of establishment of course

UEE courses 2009

UTE courses 2003

Number of qualified trainers

GC course – one full-time, several trainers in training

Other relevant information

- GC course costs \$1,745
 - Have all required resources for grid-connect installation at two campuses
 - Have a \$400k facility under construction at Wantirna campus – will be finished by end of 2009
 - Have difficulties getting subject area experts – train current staff with industry placements to keep up with current trends
-

TAFE/RTO

Ballarat TAFE

Location

Ballarat, Victoria

Name of qualifications/courses/units offered (Note: from NTIS website)

UEE21507

TAFE/RTO

Gordon TAFE

Location

Six campuses in Victoria – however mobile training unit enables training in many locations

Contact person and details

David Weston

Phone: +61 3 5246 6124

Name of qualifications/courses/units offered

UTE41301

UEE41907 will be offered in 2010

Short course in GC competencies (NUER modules)

Frequency of offering

GC short course – whenever required

Number of students previously/currently enrolled

GC short course – 80 students previously completed

Method of study

GC short course – face to face

Year of establishment of course

UTE41301 – 2004
GC short course – 2008

Number of qualified trainers

One full-time, two part-time

Other relevant information

- Demand for training in grid-connect with battery backup
- Have mobile training unit which has enabled training both in Victoria and interstate
- Course cost: \$900 when conducted in Geelong, higher costs if travel involved

TAFE/RTO

Holmesglen TAFE

Location

Three campuses in Victoria

Contact person and details

Pilar de la Torre
Phone: +61 3 9209 5779

TAFE/RTO

Centre for Appropriate Technology

Location

Alice Springs, Northern Territory

Contact person and details

Robyn
Phone: +61 8 8951 4311

Name of qualifications/courses/units offered

UEE21407 will be offered in May 2009

Target audience

Expecting to get tradespeople upskilling

Method of study

Two-week face-to-face blocks for a year

Number of qualified trainers

Four

TAFE/RTO

Central TAFE

Location

Perth, Western Australia

Contact person and details

John Paskulich
Phone: +61 8 6211 2267

Name of qualifications/courses/units offered

WS97
WT12
Short course for GC competencies.
UEE41907, UEE21507 and UEE61007 will be offered in future.

Target audience

Interested people from the community

Number of students previously/currently enrolled

Hundreds of students have finished both courses.

Year of establishment of course

Late 90s (with old training package)
GC course – 2007

Number of qualified trainers

One full-time, two part-time

Other relevant information

Facilities are not good. For example, there is no dedicated building or area where install practice can be conducted.
Very little funding.



Annex D. University training

Institution

Australian National University

Address

Department of Engineering
Faculty of Engineering and Information Technology
Australian National University
Canberra, ACT 0200

Contact person

Dr Paul Compston, Associate Dean (Undergraduate)
Phone: +61 2 612 58614
Fax: +61 2 612 50506
Email: Paul.Compston@anu.edu.au

Name and type of award offered

Bachelor of Engineering (sustainable energy systems)

Level of award

Undergraduate Bachelors degree

Objectives of course

To prepare students for successful careers as professional engineering managers, designers, analysts, educators and researchers in the field of sustainable energy.

Target audience

School leavers wishing to work as Sustainable Energy Engineers

Frequency of offering

Each year

Course duration

4 years full-time

Method of study

Face to face

Accreditation

IEAust accredited

Cost of course

Tuition fees: Australian students, HECS-HELP; International students, \$22,800 per year

Website for more information

<http://engn.anu.edu.au/>

Units/subjects specifically related to renewable energy

ENG4516 Energy Resources and Renewable Technology, ENG4524 Solar Energy Technologies

Institution

Australian National University

Address

Department of Engineering
Faculty of Engineering and Information Technology
Australian National University
Canberra, ACT 0200

Contact person

Professor Andres Cuevas, Head of Department
Phone: +61 2 612 53702
Fax: +61 2 612 50506
Email: Andres.Cuevas@anu.edu.au

Name and type of award offered

Master of Engineering (Major in Solar Energy)

Level of award

Postgraduate degree by coursework

Objectives of course

The aim of this program is to provide a higher qualification in Systems Engineering for students with a traditional engineering or other technical background.

Target audience

Graduates with a traditional engineering or other technical background

Frequency of offering

Each year

Course duration

One year full-time, two years part-time

Method of study

Face to face

Accreditation

Not applicable

Cost of course

Tuition fees: Australian students, HECS-HELP full-fees, \$15,000 per year; International students, \$19,200 per year

Website for more information

<http://engn.anu.edu.au/>

Units/subjects specifically related to renewable energy

ENG6516 Energy Resources and Renewable Technology, ENG6524 Solar Electricity

Institution

Curtin University of Technology

Address

School of Electrical & Computer Engineering
Kent Street, Bentley
Perth, Western Australia

Contact person

Graduate Studies Officer
Phone: +61 8 9266 7303
Email: sciengresearch@curtin.edu.au

Name and type of award offered

Master of Engineering Science (Renewable Energy Electrical Power Systems)

Level of award

Postgraduate degree by coursework

Objectives of course

Introduce students to power conditioning aspects of major renewable energy technologies including wind, photovoltaic and small hydro. Students will also evaluate other alternative energy sources such as fuel cells. Students will explore the use of electrical equipment required for power transmission and conditioning, including storage, and understand their workings. To provide students with knowledge of standards so you can design, analyse, simulate and implement stand-alone and grid-connected renewable or hybrid energy systems on both a small and large scale.

Target audience

Graduates in engineering or related disciplines with at least one year's work experience

Frequency of offering

Each semester

Course duration

One year full-time, two years part-time

Method of study

Face to face

Accreditation

Not applicable

Cost of course

Tuition fees: Australian students \$18,000 per year; International students, \$22,800 per year

Website for more information

<http://scieng.curtin.edu.au/>

Units/subjects specifically related to renewable energy

Renewable Energy Principles 603, Renewable Energy Systems 604

Institution

Griffith University

Address

Griffith School of Engineering
Griffith University
170 Kessels Road
Nathan, Queensland 4111

Contact person

Associate Professor Steven O'Keefe (Deputy Head of School, Nathan)
Phone: +61 7 373 55380
Facsimile: +61 7 373 55198
Email: s.okeefe@griffith.edu.au

Name and type of award offered

Bachelor of Engineering (Sustainable Energy Systems)

Level of award

Undergraduate Bachelors degree

Objectives of course

To give graduates the skills normally associated with electronics engineering, plus special skills in renewable and distributed power generation (e.g. solar, wind), efficient storage (e.g. grid-backfeeding batteries) and efficient usage of energy systems such as lighting, electric vehicles, domestic and industrial equipment, and energy auditing and environmental awareness.

Target audience

School leavers wishing to work as Sustainable Energy Engineers

Frequency of offering

Each semester

Course duration

Four years full-time

Method of study

Face to face

Cost of course

Tuition fees: Australian students, HECS-HELP; International students, \$19,680 per year.

Website for more information<http://www.griffith.edu.au/engineering-information-technology/griffith-school-engineering>**Units/subjects specifically related to renewable energy**

Efficient Energy Systems, Renewable Energy Systems, Power Distribution and Storage, Energy Resource Management

Institution

Murdoch University

Address

School of Engineering and Energy
Murdoch University
South Street
Murdoch, Western Australia 6150

Contact person

Professor Philip Jennings (Professor of Energy Studies)
Phone: +61 8 9360 2274
Email: P.Jennings@murdoch.edu.au

Name and type of award offered

Postgraduate Certificate in Energy Studies

Level of award

Postgraduate degree by coursework

Objectives of course

To cater for graduates of any discipline who wish to acquire knowledge and skills in the areas of energy management, built environment, energy systems or energy policy. A specialisation in energy systems will assist or enhance their work in areas such as energy management, the design of small to medium-size energy systems and renewable energy research. A specialisation in energy policy will assist or enhance their work in areas such as energy policy and planning, energy economics and renewable energy research. A specialisation in energy management or built environment will be applicable to careers in energy efficiency in industry or the commercial sector

Target audience

Graduates of any discipline who wish to acquire knowledge and skills in the areas of energy management, built environment, energy systems or energy policy

Frequency of offering

Each semester

Course duration

One semester full-time, two semesters part-time

Method of study

Internal or external, online

Accreditation

Not applicable

Cost of course

Tuition fees: Australian students, \$4,308–\$5,596 full course; International students, \$9,750 full course.

Website for more information

<http://www.eepe.murdoch.edu.au/>

Units/subjects specifically related to renewable energy

PEC592 Energy in Society, PEC594 Energy Management, PEC590 Energy Systems, PEC587 Renewable Energy and Sustainable Development, PEC621 Renewable Energy Devices, PEC622 Renewable Energy Resources, PEC623 Renewable Energy Systems Design, PEC620 Case Studies of Renewable Energy Systems, PEC591 Energy Policy, PEC593 Energy Economics, PEC632 Greenhouse Science and Policy, PEC627 Advanced Energy Policy: Electricity Market Reform, PEC611 Life Cycle Analysis and Greenhouse Accounting, PEC671 Solar Architecture and Health in Buildings, PEC672 Climate Sensible Home Design

Institution

Murdoch University

Address

School of Engineering and Energy
Murdoch University
South Street
Murdoch, Western Australia 6151

Contact person

Professor Philip Jennings (Professor of Energy Studies)
Phone: +61 8 9360 2274
Email: P.Jennings@murdoch.edu.au

Name and type of award offered

Postgraduate Diploma in Energy Studies

Level of award

Postgraduate degree by coursework

Objectives of course

To assist graduates wishing to move into employment in areas such as energy policy, energy economics, energy management and efficiency, sustainable energy systems design and planning, the environmental impact of energy systems and their use, as well as renewable energy research, or to enhance the skills of those already working in these areas

Target audience

Graduates wishing to move into employment in areas such as energy policy, energy economics, energy management and efficiency, sustainable energy systems design and planning, the environmental impact of energy systems and their use, as well as renewable energy research

Frequency of offering

Each semester

Course Duration

One year full-time, two years part-time

Method of study

Internal or external, online

Accreditation

Not applicable

Cost of course

Tuition fees: Australian students, \$8,960–\$9,304 full course; International students, \$19,500 full course

Website for more information

<http://www.eepe.murdoch.edu.au/>

Units/subjects specifically related to renewable energy

PEC592 Energy in Society, PEC594 Energy Management, PEC590 Energy Systems, PEC591 Energy Policy, PEC593 Energy Economics, PEC632 Greenhouse Science and Policy, PEC587 Renewable Energy and Sustainable Development, PEC611 Life Cycle Analysis and Greenhouse Accounting, PEC596 Energy Studies Project

Institution

Murdoch University

Address

School of Engineering and Energy
Murdoch University
South Street
Murdoch, Western Australia 6152

Contact person

Professor Philip Jennings (Professor of Energy Studies)
Phone: +61 8 9360 2274
Email: P.Jennings@murdoch.edu.au

Name and type of award offered

Master of Science in Renewable Energy

Level of award

Postgraduate degree by coursework

Objectives of course

The objectives of this course are:

- To provide a thorough training in the principles of sustainable energy systems
- To introduce students to the practical aspects of renewable energy systems design, monitoring and development (renewable energy systems specialisation)
- To train engineers, scientists, environmental scientists and policy analysts to participate in the development of the renewable energy and energy efficiency industries in Australia and overseas
- To address the social, economic and environmental issues involved with sustainable energy systems

Target audience

Graduates wanting specific training in advanced areas of renewable energy technology

Frequency of offering

Each semester

Course duration

One year full-time, two years part-time

Method of study

Internal or external, online

Accreditation

Not applicable

Cost of course

Tuition fees: Australian students, \$9,648–\$10,680 full course; International students, \$19,500 full course

Website for more information<http://www.eepe.murdoch.edu.au/>**Units/subjects specifically related to renewable energy**

PEC620 Case Studies of Renewable Energy Systems, PEC624 Renewable Energy Dissertation, PEC622 Renewable Energy Resources, PEC621 Renewable Energy Devices, PEC623 Renewable Energy Systems Design, PEC587 Renewable Energy and Sustainable Development, PEC632 Greenhouse Science and Policy, STP612 Sustainability, Ecology and Communities, PEC587 Renewable Energy and Sustainable Development, PEC627 Advanced Energy Policy: Electricity Market Reform, PEC611 Life Cycle Analysis and Greenhouse Accounting, PEC632 Greenhouse Science and Policy

Institution

Murdoch University

Address

School of Engineering and Energy
Murdoch University
South Street
Murdoch, Western Australia 6153

Contact person

Professor Philip Jennings (Professor of Energy Studies)
Phone: +61 8 9360 2274
Email: P.Jennings@murdoch.edu.au

Name and type of award offered

Bachelor of Engineering (Renewable Energy Engineering)

Level of award

Undergraduate Bachelors degree

Objectives of course

To teach students to design, commission and test a wide range of renewable energy systems, including solar thermal, photovoltaic, wind-based and bioenergy systems

Target audience

School leavers wishing to work as Sustainable Energy Engineers

Frequency of offering

Each year

Course duration

Four years full-time, or three years full-time including summer and winter terms

Method of study

Face to face

Accreditation

IEAust accredited

Cost of course

Tuition fees: Australian students, HECS-HELP; International students, \$20,000 per year

Date of establishment of course

Website for more information

<http://www.eepe.murdoch.edu.au/>

Units/subjects specifically related to renewable energy

ENG307 Resources for Renewable Energy, ENG352 Energy Supply Systems, ENG351 Renewable Energy Design Workshop, ENG421 Renewable Energy Systems Engineering

Institution

Murdoch University

Address

School of Engineering and Energy
Murdoch University
South Street
Murdoch, Western Australia 6154

Contact person

Professor Philip Jennings (Professor of Energy Studies)

Phone: +61 8 9360 2274

Email: P.Jennings@murdoch.edu.au

Name and type of award offered

Bachelor of Science in Sustainable Energy Management

Level of award

Undergraduate Bachelors degree

Objectives of course

To prepare graduates for a career in this challenging and rapidly expanding field; graduates can expect to use their skills in areas such as sustainable energy systems design and planning, energy policy, energy economics, energy management and efficiency, the environmental and social impact of energy systems and their use, as well as sustainable energy research

Target audience

School leavers wishing to work in the Sustainable Energy field

Frequency of offering

Each year

Course duration

Three years full-time

Method of study

Internal or external, online

Accreditation

Not applicable

Cost of course

Tuition fees: Australian students, HECS-HELP; International students, \$19,500 per year

Website for more information

<http://www.eepe.murdoch.edu.au/>

Units/subjects specifically related to renewable energy

PEC294 Energy Management, PEC292 Energy in Society, PEC332 Greenhouse Science and Policy, PEC390 Energy Systems, PEC391 Energy Policy, PEC393 Energy Economics, PEC287 Renewable Energy and Sustainable Development, PEC311 Life Cycle Analysis and Greenhouse Accounting, PEC396 Energy Studies Project

Institution

RMIT University

AddressBuildings 56 and 57, Level 5
Corner of Queensberry and Lygon Streets
Carlton, Victoria 3053**Contact Person**Dr John Andrews
Phone: +61 3 9925 6085
Email: john.andrews@rmit.edu.au**Name and type of award offered**

Graduate Certificate in Sustainable Energy

Level of award

Postgraduate degree by coursework

Objectives of course

To provide a pathway for engineers and scientists, or those with an alternative acceptable qualification and significant experience in industry, to gain a qualification in the burgeoning specialist area of 'sustainable energy'.

Target audience

Graduates in engineering or related disciplines

Frequency of offering

Each semester

Course duration

Six months full-time or one year part-time

Method of study

Face to face

Accreditation

Not applicable

Cost of course

Tuition fees: Australian students, \$8,400 full course; International students, \$11,280 full course

Website for more information<http://www.rmit.edu.au/browse;ID=7zfvsilDNS0n>**Units/subjects specifically related to renewable energy**

Sustainable Energy Technologies I, The Economic, Social and Environmental Context for Sustainable Energy, Sustainable Energy Systems and Design

Institution

RMIT University

AddressBuildings 56 and 57, Level 5
Corner of Queensberry and Lygon Streets
Carlton, Victoria 3053**Contact person**Dr John Andrews
Phone: +61 3 9925 6085
Email: john.andrews@rmit.edu.au**Name and type of award offered**

Graduate Diploma of Sustainable Energy

Level of award

Postgraduate degree by coursework

Objectives of course

To provide a pathway for engineers and scientists, or those with an alternative acceptable qualification and significant experience in industry, to gain a qualification in the burgeoning specialist area of 'sustainable energy'.

Target audience

Graduates in engineering or related disciplines

Frequency of offering

Each semester

Course duration

One year full-time, two years part-time

Method of study

Face to face

Accreditation

Not applicable

Cost of course

Tuition fees: Australian students, \$16,800 full course; International students, \$22,560 full course

Website for more information

<http://www.rmit.edu.au/browse;ID=7zfvildns0n>

Units/subjects specifically related to renewable energy

The Economic, Social and Environmental Context for Sustainable Energy, Sustainable Energy Systems and Design, Sustainable Energy Technologies I, Sustainable Energy Technologies II

Institution

RMIT University

Address

Buildings 56 and 57, Level 5
Corner of Queensberry and Lygon Streets
Carlton, Victoria 3053

Contact person

Dr John Andrews
Phone: +61 3 9925 6085
Email: john.andrews@rmit.edu.au

Name and type of award offered

Masters of Engineering (Sustainable Energy)

Level of award

Postgraduate degree by coursework

Objectives of course

To provide a pathway for engineers and scientists, or those with an alternative acceptable qualification and significant experience in industry, to gain a qualification in the burgeoning specialist area of 'sustainable energy'.

Target audience

Graduates in engineering or related disciplines

Frequency of offering

Each semester

Course duration

1.5 years full-time

Method of study

Face to face

Accreditation

Not applicable

Cost of course

Tuition fees: Australian students, \$16,800 per year; International students, \$22,560 per year

Website for more information

<http://www.rmit.edu.au/browse;ID=7zfvildns0n>

Units/subjects specifically related to renewable energy

Developing and Evaluating Proposals for Sustainable Energy Systems, Sustainable Energy Design Project I, Sustainable Energy Design Project II, Sustainable Energy Design Project

Institution

RMIT University

Address

RMIT University
School of Civil, Environmental and Chemical Engineering
GPO Box 2476V
Melbourne, Victoria 3001

Contact person

Edmund Horan
School of Civil, Environmental and Chemical Engineering
Phone: +61 3 9925 6085
Email: edmund.horan@rmit.edu.au

Name and type of award offered

Graduate Certificate in Sustainable Practice

Level of award

Postgraduate degree by coursework

Objectives of course

To extend students' view of sustainability and sustainable practice by:

- Exploring individuals' view of sustainability, what it means for them, what it might mean for their employer and their project and getting students into action around change

- Recognising the Long Now: that the precise moment individuals are in, grows out of the past and is a seed for the future
- Recognising that as humans we can create realities by first imagining them
- Recognising that being here includes more than work and home; that the Big Here could be the wider local community, Australia, the world
- Developing sustainable practice as a process of continual change based on reflective practice

Target audience

Graduates in engineering or related disciplines with at least three years of relevant professional or additional academic experience

Frequency of offering

Each semester

Course duration

Six months full-time or one year part-time

Method of study

Face to face

Accreditation

Not applicable

Cost of course

Tuition fees: Australian students, \$7,680 full course; International students, \$11,280 full course

Website for more information

<http://www.rmit.edu.au/civil-enviro-chem>

Units/subjects specifically related to renewable energy

Sustainable Energy Policy and Practice, Sustainable Energy Systems and Design, Sustainable Energy Technologies I, Sustainable Energy Technologies II

Institution

RMIT University

Address

RMIT University
School of Civil, Environmental and Chemical Engineering
GPO Box 2476V
Melbourne, Victoria 3001

Contact person

Edmund Horan
School of Civil, Environmental and Chemical Engineering
Phone: +61 3 9925 6085
Email: edmund.horan@rmit.edu.au

Name and type of award offered

Graduate Diploma of Sustainable Practice

Level of award

Postgraduate degree by coursework

Objectives of course

To extend students' view of sustainability and sustainable practice by:

- Exploring individuals' view of sustainability, what it means for them, what it might mean for their employer and their project and getting students into action around change
- Recognising the Long Now: that the precise moment individuals are in, grows out of the past and is a seed for the future
- Recognising that as humans we can create realities by first imagining them
- Recognising that being here includes more than work and home; that the Big Here could be the wider local community, Australia, the world
- Developing sustainable practice as a process of continual change based on reflective practice

Target audience

Graduates in engineering or related disciplines with at least three years of relevant professional or additional academic experience

Frequency of offering

Each semester

Course duration

One year full-time, two years part-time

Method of study

Face to face

Accreditation

Not applicable

Cost of course

Tuition fees: Australian students, \$15,360 full course; International students, \$22,560 full course

Website for more information

<http://www.rmit.edu.au/civil-enviro-chem>

Units/subjects specifically related to renewable energy

Sustainable Energy Policy and Practice, Sustainable Energy Systems and Design, Sustainable Energy Technologies I, Sustainable Energy Technologies II

Institution

RMIT University

Address

RMIT University
School of Civil, Environmental and Chemical Engineering
GPO Box 2476V
Melbourne, Victoria 3001

Contact person

Edmund Horan
School of Civil, Environmental and Chemical Engineering
Telephone: +61 3 9925 6085
Email: edmund.horan@rmit.edu.au

Name and type of award offered

Masters of Engineering (Sustainable Practice)

Level of award

Postgraduate degree by coursework

Objectives of course

To extend students' view of sustainability and sustainable practice by:

- Exploring individuals' view of sustainability, what it means for them, what it might mean for their employer and their project and getting students into action around change
- Recognising the Long Now: that the precise moment individuals are in, grows out of the past and is a seed for the future
- Recognising that as humans we can create realities by first imagining them
- Recognising that being here includes more than work and home; that the Big Here could be the wider local community, Australia, the world
- Developing sustainable practice as a process of continual change based on reflective practice

Target audience

Graduates in engineering or related disciplines with at least three years of relevant professional or additional academic experience

Frequency of offering

Each semester

Course duration

1.5 years full-time

Method of study

Face to face

Accreditation

Not applicable

Cost of course

Tuition fees: Australian students, \$15,360 per year; International students, \$22,560 per year

Website for more information

<http://www.rmit.edu.au/civil-enviro-chem>

Units/subjects specifically related to renewable energy

Sustainable Energy Policy and Practice, Sustainable Energy Systems and Design, Sustainable Energy Technologies I, Sustainable Energy Technologies II

Institution

University of Adelaide

Address

Room S134 Engineering South Building
The University of Adelaide, South Australia 5005

Contact person

Dr Katrina Falkner (Associate Dean – Learning & Teaching)
Phone: +61 8 830 36178
Email: katrina.falkner@adelaide.edu.au

Name and type of award offered

Bachelor of Engineering in Sustainable Energy Engineering

Level of award

Undergraduate Bachelors degree

Objectives of course

- Sustainable Engineering (Chemical) is focused on producing chemical engineers with the knowledge and skills required to improve and design ground-breaking processes that are technically, economically and environmentally sound.
- Sustainable Energy Engineering (Electrical) is about the electrical technologies supporting renewable energy systems including energy conversion units and power electronics converters.
- Sustainable Engineering (Mechanical) concerns the design of systems using heat, fluid flows and moving systems. It includes the assessment of aerodynamics, structural loads, vibrations, thermal power and cooling cycles, combustion and automatic control. The program is also concerned with all possible renewable energy forms including wind, wave, tidal, solar, geothermal, hydro, pumped storage and bioenergy.

Target audience

School leavers wishing to work as Sustainable Energy Engineers

Frequency of offering

Each year

Course duration

Four years full-time

Method of study

Face to face

Accreditation

IEAust accredited

Cost of course

Tuition fees: Australian students, HECS-HELP; International students, \$23,000 per year

Website for more information

<http://www.ecms.adelaide.edu.au/>

Units/subjects specifically related to renewable energy

MECH ENG 3017 Sustainability & the Environment, Wind Turbine Design, Bio-Fuels, Research Project (Renewable Energy), Plant Design Project (Renewable Energy), Distributed Generation Technologies, ELEC ENG 2012 Sustainable Energy Project II, Project Management for Sustainable Engineering, Architectural Issues and Sustainable Energy, MECH ENG 4138A Sustainable Energy Design Project Level IV, MECH ENG 4139A Sustainable Energy Honours Project Level IV, Wind Turbine Design, Frontier Technologies (Sustainable Energy), Distributed Generation Technologies, Energy Management Economics & Policy, MECH ENG 4127 Wind Engineering

Institution

University of Melbourne

Address

Melbourne School of Engineering Office
Building 173, Grattan Street
The University of Melbourne
Parkville, Victoria 3010

Contact person

General enquiries
Phone: + 61 3 8344 6703

Name and type of award offered

Graduate Diploma in Engineering (Energy Engineering)

Level of award

Postgraduate degree by coursework

Objectives of course

- The Graduate Program in Energy Studies is designed to meet the theoretical and practical needs of professionals working in the field of energy use and planning in both the government and private sectors.
- The program provides participants with a broad understanding of the range of conventional and non-conventional technologies that can be used for energy supply. Issues of energy planning, energy end-use and the non-technical factors influencing the acceptance of energy technologies can also be studied.
- Themes covered in this program include: renewable energy technologies, conventional energy technologies, energy sources and resources, energy conversion and utilisation, energy from wastes, barriers to technology transfer, environmental effects of energy use and energy efficiency.

Target audience

Graduates in engineering or related disciplines

Frequency of offering

Each year

Course duration

One year full-time

Method of study

Face to face

Accreditation

Not applicable

Cost of course

Tuition fees: Australian students, \$26,144 full course; International students, \$30,296 full course

Website for more information

<http://www.eng.unimelb.edu.au/Postgrad/>

Units/subjects specifically related to renewable energy

421-626 Design of Energy Systems

Institution

University of Melbourne

Address

Melbourne School of Engineering Office
Building 173, Grattan Street
The University of Melbourne
Parkville, Victoria 3010

Contact person

General enquiries

Phone: + 61 3 8344 6703

Name and type of award offered

Master of Energy Studies

Level of award

Postgraduate degree by coursework

Objectives of course

The Graduate Program in Energy Studies is designed to meet the theoretical and practical needs of professionals working in the field of energy use and planning, both in government and private sectors.

That a graduate of the program should:

- acquire key employment skills in the engineering practice of energy technologies
- gain advanced knowledge in a chosen area of interest in energy technologies, planning and use

Target audience

Graduates in engineering or related disciplines

Frequency of offering

Each year

Course duration

One year full-time

Method of study

Face to face

Accreditation

Not applicable

Cost of course

Tuition fees: Australian students, \$26,144 full course; International students, \$30,296 full course

Website for more information

<http://www.eng.unimelb.edu.au/Postgrad/>

Units/subjects specifically related to renewable energy

421-626 Design of Energy Systems, 421-711 Solar Energy

Institution

University of Melbourne

Address

Melbourne School of Engineering Office
Building 173, Grattan Street
The University of Melbourne
Parkville, Victoria 3010

Contact person

General enquiries

Phone: + 61 3 8344 6703

Name and type of award offered

Master of Engineering Science (Energy Studies)

Level of award

Postgraduate degree by coursework

Objectives of course

The Graduate Program in Energy Studies is designed to meet the theoretical and practical needs of professionals working in the field of energy use and planning, both in government and private sectors.

That a graduate of the program should:

- acquire key employment skills in the engineering practice of energy technologies
- gain advanced knowledge in a chosen area of interest in energy technologies, planning and use

Target audience

Graduates in engineering or related disciplines

Frequency of offering

Each semester

Course duration

1.5 years full-time

Method of study

Face to face

Accreditation

Not applicable

Cost of course

Tuition fees: Australian students, \$26,144 per year; International students, \$30,296 per year

Date of establishment of course

Website for more information

<http://www.eng.unimelb.edu.au/Postgrad/>

Units/subjects specifically related to renewable energy

421-626 Design of Energy Systems, 421-711 Solar Energy

Other relevant information

The final intake for this course will be Semester 2, 2009

Institution

University of New South Wales

Address

The School of Photovoltaic and Renewable Energy Engineering

Electrical Engineering Building

UNSW, Sydney, NSW 2052

Contact person

Associate Professor Alistair Sproul (Postgraduate Coordinator)

Phone: +61 2 9385 4039

Fax: +61 2 9385 7762

Email: a.sproul@unsw.edu.au

Name and type of award offered

Graduate Certificate of Engineering Science (Photovoltaics and Solar Energy)

Level of award

Postgraduate degree by coursework

Objectives of course

The objective of the program is to produce well-educated postgraduate-qualified engineers with the skills, attributes and knowledge required to practise as professional engineers in the photovoltaic and renewable energy industries.

Target audience

Practising engineers and other graduates wishing to pursue a specialised range of courses to enhance their career opportunities in photovoltaics and solar energy

Frequency of offering

Each year

Course duration

One year full-time

Method of study

Face to face

Accreditation

Not applicable

Cost of course

Tuition fees: Australian students, \$19,440 full course; International students, \$24,480 full course

Website for more information

www.pv.unsw.edu.au

Units/subjects specifically related to renewable energy

SOLA9001 Photovoltaics, SOLA9002 Solar Cells & Systems, SOLA9003 High Efficiency SI Solar Cells, SOLA9005 Advanced Semiconductor Devices, SOLA9006 Sol CI Technology & Manufacturing, SOLA9008 Special Topic in PV, SOLA9020 Semiconductor Lab Operation, SOLA9021 Advanced Semiconductor Lab Design, SOLA9022 Solar Cell Design, Fabrication & Characterisation, SOLA9007 Grid-Connected Photovoltaics, SOLA9009 Photovoltaics in Buildings, SOLA9013 Renewable Energy Product Reliability, SOLA9014 PV Stand-Alone System Design & Installation, SOLA9028 Special Topic PV Systems & Ap, MECH9720 Solar Thermal Energy Design, SOLA9004 Solar Energy, SOLA9010 Wind Energy, SOLA9011 Biomass Energy Sources, SOLA9012 Renewable Energy Policy, SOLA9018 Special Topic Renewable Energy

Institution

University of New South Wales

Address

The School of Photovoltaic and Renewable Energy Engineering
Electrical Engineering Building
UNSW, Sydney, NSW 2052

Contact person

Associate Professor Alistair Sproul (Postgraduate Coordinator)
Phone: +61 2 9385 4039
Fax: +61 2 9385 7762
Email: a.sproul@unsw.edu.au

Name and type of award offered

Graduate Diploma of Engineering Science (Photovoltaics and Solar Energy)

Level of award

Postgraduate degree by coursework

Objectives of course

The objective of the program is to produce well-educated postgraduate-qualified engineers with the skills, attributes and knowledge required to practise as professional engineers in the photovoltaic and renewable energy industries.

Target audience

Practising engineers and other graduates wishing to pursue a specialised range of courses to enhance their career opportunities in photovoltaics and solar energy

Frequency of offering

Each year

Course duration

1.5 year full-time

Method of study

Face to face

Accreditation

Not applicable

Cost of course

Tuition fees: Australian students, \$19,440 per year; International students, \$24,480 per year

Website for more information

www.pv.unsw.edu.au

Units/subjects specifically related to renewable energy

SOLA9001 Photovoltaics, SOLA9002 Solar Cells & Systems, SOLA9003 High Efficiency SI Solar Cells, SOLA9005 Advanced Semiconductor Devices, SOLA9006 Sol CI Technology & Manufacturing, SOLA9008 Special Topic in PV, SOLA9020 Semiconductor Lab Operation, SOLA9021 Advanced Semiconductor Lab Design, SOLA9022 Solar Cell Design, Fabrication & Characterisation, SOLA9007 Grid-Connected Photovoltaics, SOLA9009 Photovoltaics in Buildings, SOLA9013 Renewable Energy Product Reliability, SOLA9014 PV Stand-Alone System Design & Installation, SOLA9028 Special Topic PV Systems & Ap, MECH9720 Solar Thermal Energy Design, SOLA9004 Solar Energy, SOLA9010 Wind Energy, SOLA9011 Biomass Energy Sources, SOLA9012 Renewable Energy Policy, SOLA9018 Special Topic Renewable Energy

Institution

University of New South Wales

Address

The School of Photovoltaic and Renewable Energy Engineering
Electrical Engineering Building
UNSW, Sydney, NSW 2052

Contact person

Associate Professor Alistair Sproul (Postgraduate Coordinator)
Phone: +61 2 9385-4039
Fax: +61 2 9385-7762
Email: a.sproul@unsw.edu.au

Name and type of award offered

Master of Engineering Science (Photovoltaics and Solar Energy)

Level of award

Postgraduate degree by coursework

Objectives of course

The objective of the program is to produce well-educated postgraduate-qualified engineers with the skills, attributes and knowledge required to practise as professional engineers in the photovoltaic and renewable energy industries.

Target audience

Practising engineers and other graduates wishing to pursue a specialised range of courses to enhance their career opportunities in photovoltaics and solar energy

Frequency of offering

Each year

Course duration

1.5 years full-time

Method of study

Face to face

Accreditation

Not applicable

Cost of course

Tuition fees: Australian students, \$19,440 per year; International students, \$24,480 per year

Website for more information

www.pv.unsw.edu.au

Units/subjects specifically related to renewable energy

SOLA9001 Photovoltaics, SOLA9002 Solar Cells & Systems, SOLA9003 High Efficiency SI Solar Cells, SOLA9005 Advanced Semiconductor Devices, SOLA9006 Sol CI Technology & Manufacturing, SOLA9008 Special Topic in PV, SOLA9020 Semiconductor Lab Operation, SOLA9021 Advanced Semiconductor Lab Design, SOLA9022 Solar Cell Design, Fabrication & Characterisation, SOLA9007 Grid-Connected Photovoltaics, SOLA9009 Photovoltaics in Buildings, SOLA9013 Renewable Energy Product Reliability, SOLA9014 PV Stand-Alone System Design & Installation, SOLA9028 Special Topic PV Systems & Ap, MECH9720 Solar Thermal Energy Design, SOLA9004 Solar Energy, SOLA9010 Wind Energy, SOLA9011 Biomass Energy Sources, SOLA9012 Renewable Energy Policy, SOLA9018 Special Topic Renewable Energy

Institution

University of New South Wales

Address

The School of Photovoltaic and Renewable Energy Engineering
Electrical Engineering Building
UNSW, Sydney, NSW 2052

Contact person

Associate Professor Alistair Sproul (Postgraduate Coordinator)
Phone: +61 2 9385 4039
Fax: +61 2 9385 7762
Email: a.sproul@unsw.edu.au

Name and type of award offered

Master of Engineering Science (Extension) (Photovoltaics and Solar Energy)

Level of award

Postgraduate degree by coursework

Objectives of course

The objective of the program is to produce well-educated postgraduate-qualified engineers with the skills, attributes and knowledge required to practise as professional engineers in the photovoltaic and renewable energy industries.

Target audience

Practising engineers and other graduates wishing to pursue a specialised range of courses to enhance their career opportunities in photovoltaics and solar energy

Frequency of offering

Each year

Course duration

Two years full-time

Method of study

Face to face

Accreditation

Not applicable

Cost of course

Tuition fees: Australian students, \$19,440 per year; International students, \$24,480 per year

Website for more information

www.pv.unsw.edu.au

Units/subjects specifically related to renewable energy

SOLA9001 Photovoltaics, SOLA9002 Solar Cells & Systems, SOLA9003 High Efficiency SI Solar Cells, SOLA9005 Advanced Semiconductor Devices, SOLA9006 Sol CI Technology & Manufacturing, SOLA9008 Special Topic in PV, SOLA9020 Semiconductor Lab Operation, SOLA9021 Advanced Semiconductor Lab Design, SOLA9022 Solar Cell Design, Fabrication & Characterisation, SOLA9007 Grid-Connected Photovoltaics, SOLA9009 Photovoltaics in Buildings, SOLA9013 Renewable Energy Product Reliability, SOLA9014 PV Stand-Alone System Design & Installation, SOLA9028 Special Topic PV Systems & Ap, MECH9720 Solar Thermal Energy Design, SOLA9004 Solar Energy, SOLA9010 Wind Energy, SOLA9011 Biomass Energy Sources, SOLA9012 Renewable Energy Policy, SOLA9018 Special Topic Renewable Energy

Institution

University of New South Wales

Address

The School of Photovoltaic and Renewable Energy Engineering
Electrical Engineering Building
UNSW, Sydney, NSW 2052

Contact person

Dr Evatt Hawkes (Undergraduate Coordinator)
Phone: +61 2 9385 4602
Fax: +61 2 9385 7762
Email: evatt.hawkes@unsw.edu.au

Name and type of award offered

Bachelor of Engineering (Photovoltaics and Solar Energy)

Level of award

Undergraduate Bachelors degree

Objectives of course

To develop well-educated graduates with the basic skills, attributes and knowledge required to practise as professional engineers in the areas of photovoltaics and solar energy

Target audience

School leavers wishing to work as Sustainable Energy Engineers

Frequency of offering

Each year

Course duration

Four years full-time

Method of study

Face to face

Cost of course

Tuition fees: Australian students, HECS-HELP; International students, \$25,680 per year

Website for more information

www.pv.unsw.edu.au

Units/subjects specifically related to renewable energy

MECH9720 Solar Thermal Energy Design, SOLA1070 Sustainable Energy, SOLA2020 PV Technology & Manufacturing, SOLA2051 Project in PV and SE 1, SOLA2052 Project in PV and SE 2, SOLA2053 Sustainable & Renewable Energy Technologies, SOLA3010 PV in the Built Environment, SOLA3507 Solar Cells, SOLA3540 Applied PV, SOLA4012 Grid-Connect PV Syst, SOLA5050 Renewable Energy Policy and International Programs, SOLA5051 Life Cycle Assessment, SOLA5052 Biomass, SOLA5053 Wind Energy Converters, SOLA5054 PV Stand-Alone Sys. Des. & Inst., SOLA5055 Semiconductor Devices, SOLA5056 Sustainable Energy Developing Country, SOLA5057 Energy Efficiency, SOLA5058 Special Topic in PV, SOLA5508 High Efficiency SI Solar Cells

Institution

University of New South Wales

Address

The School of Photovoltaic and Renewable Energy Engineering
Electrical Engineering Building
UNSW, Sydney, NSW 2052
Australia

Contact person

Dr Evatt Hawkes (Undergraduate Coordinator)
Phone: +61 2 9385 4602
Fax: +61 2 9385 7762
Email: evatt.hawkes@unsw.edu.au

Name and type of award offered

Bachelor of Engineering (Renewable Energy)

Level of award

Undergraduate Bachelors degree

Objectives of course

To develop well-educated graduates with the basic skills, attributes and knowledge required to practise as professional engineers in the area of renewable energy

Target audience

School leavers wishing to work as Sustainable Energy Engineers

Frequency of offering

Each year

Course duration

Four years full-time

Method of study

Face to face

Cost of course

Tuition fees: Australian students, HECS-HELP; International students, \$25,680 per year

Website for more informationwww.pv.unsw.edu.au**Units/subjects specifically related to renewable energy**

M523 (Murdoch) Renewable Energy Systems Design, MECH9720 Solar Thermal Energy Design, SOLA1070 Sustainable Energy, SOLA2020 PV Technology & Manufacturing, SOLA2053 Sustainable & Renewable Energy Technologies, SOLA3010 PV in the Built Environment, SOLA3507 Solar Cells, SOLA3540 Applied PV, SOLA4012 Grid-Connect PV Syst, SOLA5050 Renewable Energy Policy and International Programs, SOLA5051 Life Cycle Assessment, SOLA5052 Biomass, SOLA5053 Wind Energy Converters, SOLA5054 PV Stand-Alone Sys. Des.&Inst., SOLA5056 Sustainable Energy Developing Country, SOLA5058 Special Topic in PV, SOLA5508 High Efficiency SI Solar Cells

Institution

University of South Australia

AddressMawson Lakes campus
Mawson Lakes Boulevard
Mawson Lakes, South Australia 5095**Contact person**

Dr Romeo Marian (Program Director)

Phone: +61 8 8302 5275

Fax: +61 8 8302 3380

Email: romeo.marian@unisa.edu.au**Name and type of award offered**

Bachelor of Engineering (Mechanical and Sustainable Systems)

Level of award

Undergraduate Bachelors degree

Objectives of course

The program aims to prepare students for professional careers in mechanical and manufacturing engineering with an in-depth knowledge in mechanical plant design, manufacturing technology and engineering materials.

Target audience

School leavers wishing to work as Sustainable Energy Engineers

Frequency of offering

Each year

Course duration

Four years full-time or accelerated three years full-time

Method of study

Face to face

Accreditation

IEAust accredited

Cost of course

Tuition fees: Australian students, HECS-HELP; International students, \$19,800 per year

Website for more information<http://www.unisa.edu.au/itee/default.asp>**Units/subjects specifically related to renewable energy**

Energy and Society, Sustainable Energy System Design

Institution

University of South Australia

AddressMawson Lakes campus
Mawson Lakes Boulevard
Mawson Lakes, South Australia 5095**Contact person**Professor Wasim Saman (Program Director)
Phone: +61 8 8302 3008
Fax: +61 8 8302 5613
Email: Wasim.Saman@unisa.edu.au**Name and type of award offered**

Graduate Certificate in Engineering (Energy Management)

Level of award

Postgraduate degree by coursework

Objectives of course

The program is designed to provide advanced coursework leading to a recognised qualification in Energy Management.

Target audience

Graduates in engineering, science or related disciplines or with relevant industry experience

Frequency of offering

Each year

Course duration

Six months full-time

Method of study

Face to face

Accreditation

Not applicable

Cost of course

Commonwealth-supported places \$3,706

Website for more information<http://www.unisa.edu.au/itee/default.asp>**Units/subjects specifically related to renewable energy**

Energy and Society, Sustainable Energy System Design

Other relevant informationUniversity-level Research, Training for Renewable Energy

Institution

Australian National University

AddressFaculty of Engineering and Information Technology
Building 31
The Australian National University
Canberra, ACT 0200 Australia**Contact Person**Dr Matthew Doolan
Phone: +61 2 6125 2739
Fax: +61 2 6125 8623
Email: engineering.gradprog@anu.edu.au**Name and type of award offered**

Master and Doctor of Philosophy

Level of award

Postgraduate degree by research

Target audience

Graduates with first-class or upper second-class honours degrees

Frequency of offering

Yearly

Course duration

Two (MPhil) or three (PhD) years full-time

Method of study

On-campus

Cost of course

Tuition fees: Australian students, Research Training Scheme (RTS); International students, \$24,000 per year

Website for more information

http://info.anu.edu.au/studyat/Graduate_School/Study_Fields/engis

Areas of research training

Photovoltaic Solar Science and Technologies, Solar Thermal Science and Technologies and Energy and the Environment

Institution

Curtin University of Technology

Address

School of Electrical & Computer Engineering
Kent Street, Bentley
Perth, Western Australia 6000

Contact person

Graduate Studies Officer
Phone: +61 8 9266 7303
Email: sciengresearch@curtin.edu.au

Name and type of award offered

Master and Doctor of Philosophy

Level of award

Postgraduate degree by research

Target audience

Graduates with first-class or upper second-class honours degrees

Frequency of offering

Yearly

Course duration

One to two (MPhil) or two to four (PhD) years full-time

Method of study

On-campus

Cost of course

Tuition fees: Australian students, Research Training Scheme (RTS); International students, \$24,400 per year

Website for more information

<http://www.curtin.edu.au/research/>

Areas of research training

Distributed Generation, Power Electronics Applied to Renewable Energy, Wind Generator Integration to Grid, Distribution System Optimisation, Fuel Cell Dynamics and Modelling

Institution

Murdoch University

Address

School of Engineering and Energy
Murdoch University
South Street, Murdoch
Western Australia 6151

Contact person

Murdoch University Graduate Centre
Phone: +61 8 9360 6506
Fax: +61 8 9360 6503
Email: scholars@murdoch.edu.au

Name and type of award offered

Master and Doctor of Philosophy

Level of award

Postgraduate degree by research

Target audience

Graduates with first-class or upper second-class honours degrees

Frequency of offering

Twice yearly

Course duration

Two (MPhil) or three (PhD) years full-time

Method of study

On-campus, some external

Cost of course

Tuition fees: Australian students, Research Training Scheme (RTS); International students, \$23,750 per year

Website for more information

<http://www.research.murdoch.edu.au/gradcentre/>

Areas of research training

Analysis and Monitoring of Renewable Energy Systems; Design, Performance and Economic Analysis of Hybrid RAPS Systems, Simulation and Control of Renewable Energy Systems, Amorphous Silicon Photovoltaics, Small Wind Turbine, Sustainable Transport, Fuel Cells

Institution

RMIT University

Address

Buildings 56 and 57, Level 5
Corner of Queensberry and Lygon Streets
Carlton, Victoria 3053

Contact person

Professor Robin Usher (Director, Research Training)
Phone: +61 3 9925 8341
Email: robin.usher@rmit.edu.au

Name and type of award offered

Master of Engineering and Doctor of Philosophy

Level of award

Postgraduate degree by research

Target audience

Graduates with first-class or upper second-class honours degrees

Frequency of offering

Twice yearly

Course duration

Two (MEng) or four (PhD) years full-time

Method of study

On-campus

Cost of course

Tuition fees: Australian students, Research Training Scheme (RTS); International students, \$23,520 per year

Website for more information

<http://www.rmit.edu.au/research>

Areas of research training

Renewable Energy Hydrogen Systems for Remote Area Power Supply, Unitised Regenerative Fuel Cells, Solar Thermal Desalination Methods

Institution

University of Adelaide

Address

Room S134 Engineering South Building
The University of Adelaide
South Australia 5005

Contact person

Adelaide Graduate Centre
Phone: +61 8 8303 5882
Fax: +61 8 8303 5725
Email: graduate.centre@adelaide.edu.au

Name and type of award offered

Master and Doctor of Philosophy

Level of award

Postgraduate degree by research

Target audience

Graduates with first-class or upper second-class honours degrees

Frequency of offering

Twice yearly

Course duration

Two (MPhil) or four (PhD) years full-time

Method of study

On-campus

Cost of course

Tuition fees: Australian students, Research Training Scheme (RTS); International students, \$26,000 per year

Website for more information

<http://www.adelaide.edu.au/student/postgrad/>

Areas of research training

Geothermal Energy, Wind Turbine Design, Wave Energy, Solar Energy

Institution

University of Melbourne

Address

Melbourne School of Engineering Office
Building 173, Grattan Street
The University of Melbourne
Parkville, Victoria 3010

Contact person

Professor Ian Bishop (Director – CGISM)
Phone: +61 3 8344 7500
Fax: +61 3 9347 2916
Email: i.bishop@unimelb.edu.au

Name and type of award offered

Master of Engineering and Doctor of Philosophy

Level of award

Postgraduate degree by research

Target audience

Graduates with first-class or upper second-class honours degrees

Frequency of offering

Twice yearly

Course duration

Two (MEng) or three (PhD) years full-time

Method of study

On-campus

Cost of course

Tuition fees: Australian students, Research Training Scheme (RTS); International students, \$30,300 per year

Website for more information

<http://www.unimelb.edu.au/about/research/>

Areas of research training

Energy Management of Hybrid Electric Vehicles with Real Time Traffic-Prediction, Energy Studies in Rural Development

Institution

University of New South Wales

Address

The School of Photovoltaic and Renewable Energy Engineering
Electrical Engineering Building
UNSW, Sydney, NSW 2052

Contact person

Associate Professor Alistair Sproul (Postgraduate Coordinator)
Phone: +61 2 9385-4039
Fax: +61 2 9385-7762
Email: a.sproul@unsw.edu.au

Name and type of award offered

Master of Engineering and Doctor of Philosophy

Level of award

Postgraduate degree by research

Target audience

Graduates with first class or upper second class honours degrees

Frequency of offering

Twice yearly

Course duration

Two (MEng) or three (PhD) years full-time

Method of study

On-campus

Cost of course

Tuition fees: Australian students, Research Training Scheme (RTS); International students, \$26,160 per year

Website for more information

<http://www.unsw.edu.au/research/res/research.html>

Areas of research training

Crystalline Silicon Solar Cells – Design and Processing Techniques, Electrical Energy Storage, GaAs and SiGe Devices, Light Trapping in Thin Crystalline Silicon, Novel Semiconductor Devices, Photovoltaic Applications in Developing Countries, Photovoltaic Device Fabrication and Characterisation, Photovoltaic Device Physics, Modelling, Design and Characterisation, Photovoltaic Module Design, Photovoltaic Solar Energy Conversion, Quantum Well and Advanced Solar Cell Structures, Quantum Well, Wire and Dot Structures, Semiconductor Device Modelling, Semiconductor Device Physics, Commercially Oriented Silicon Solar Cells Device Design, Processing and Characterisation, Thin Film Crystalline Silicon Photovoltaic Devices

Institution

University of Newcastle

Address

School of Engineering
Faculty of Engineering and Built Environment
ES Building – ES408
University of Newcastle
University Drive
Callaghan, NSW 2308

Contact person

Andrew Abbo (Assistant Dean Research Training)
Phone: +61 2 4921 5582
Fax: +61 2 4921 6991
Email: Andrew.Abbo@newcastle.edu.au

Name and type of award offered

Master of Engineering and Doctor of Philosophy

Level of award

Postgraduate degree by research

Target audience

Graduates with first-class or upper second-class honours degrees

Frequency of offering

Twice yearly

Course duration

Two (MPhil) or three (PhD) years full-time

Method of study

On-campus

Cost of course

Tuition fees: Australian students, Research Training Scheme (RTS); International students, \$20,800 per year

Website for more information

<http://www.newcastle.edu.au/research.html>

Areas of research training

High Efficiency Composite and Timber Blades for Small Horizontal Axis Wind Turbines

Institution

University of South Australia

Address

The Sustainable Energy Centre
University of South Australia
Building J2-02
Mawson Lakes campus
Mawson Lakes, South Australia 5095

Contact person

Professor Wasim Saman (Director – SEC)
Telephone: +61 8 830 23008
Fax: +61 8 830 25613
Email: Wasim.Saman@unisa.edu.au

Name and type of award offered

Master of Engineering and Doctor of Philosophy

Level of award

Postgraduate degree by research

Target audience

Graduates with first-class or upper second-class honours degrees

Frequency of offering

Twice yearly

Course duration

Two (MEng) or four (PhD) years full-time

Method of study

On-campus

Cost of course

Tuition fees: Australian students, Research Training Scheme (RTS); International students, \$23,000 per year

Website for more information

<http://www.unisa.edu.au/resdegrees/default.asp>

Areas of research training

Solar and Energy Efficient Heating and Cooling, Energy Use in Housing and Buildings, Thermal Energy Storage, Alternative Fuels and Vehicles, Wind and Water Energy

Institution

University of Sydney

Address

Level 2 Building J13
School of Electrical and Information Engineering
University of Sydney

Contact person

Professor Vassilios G. Agelidis (Energy Australia Chair of Power Engineering)
Phone: +61 2 9351 3446
Email: v.agelidis@ee.usyd.edu.au

Name and type of award offered

Master of Engineering, Master of Philosophy and Doctor of Philosophy

Level of award

Postgraduate degree by research

Target audience

Graduates with first class or upper second class honours degrees

Frequency of offering

Twice yearly

Course duration

One (MEng), one (MPhil) or three (PhD) years full-time

Method of study

On-campus

Cost of course

Tuition fees: Australian students, Research Training Scheme (RTS); International students, \$28,320 per year

Website for more information

<http://www.usyd.edu.au/research/index.shtml>

Areas of research training

Energy Storage, Renewable Energy Technology, Fuel Cells, Distributed Generation

Institution

University of Tasmania

Address

School of Engineering – CREPS
University of Tasmania
Hobart, Tasmania 7001

Contact person

Professor Michael Negnevitsky (Director of CREPS)
Phone: +61 3 6226 7613
Fax: +61 3 6226 7247
Email: Michael.Negnevitsky@utas.edu.au

Name and type of award offered

Master of Engineering Science and Doctor of Philosophy

Level of award

Postgraduate degree by research

Target audience

Graduates with first class or upper second class honours degrees

Frequency of offering

Twice yearly

Course duration

Two (MEng) or four (PhD) years full-time

Method of study

On-campus

Cost of course

Tuition fees: Australian students, Research Training Scheme (RTS); International students, \$18,000 per year

Website for more information<http://www.research.utas.edu.au/>**Areas of research training**

Distributed Generation, Energy Storage Systems, Remote Area Power Supply (RAPS) Systems, Hybrid Systems, Rural Area Networks, Micro-Grids and Smart-Grids, Wind and Hydro

Institution

Monash University

AddressFaculty of Engineering
Building 72, Clayton campus
Monash University, Victoria 3800**Contact person**Karen Sutherland (Research Communications Manager)
Phone: +61 3 9903 4844
Fax: +61 3 9903 4886
Email: karen.sutherland@adm.monash.edu.au**Name and type of award offered**

Master of Engineering Science and Doctor of Philosophy

Level of award

Postgraduate degree by research

Target audience

Graduates with first class or upper second class honours degrees

Frequency of offering

Twice yearly

Course duration

One or two (MEng) or four (PhD) years full-time

Method of study

On-campus and external

Cost of course

Tuition fees: Australian students, Research Training Scheme (RTS); International students, \$26,900 per year

Website for more information<http://www.monash.edu.au/research/>**Areas of research training**

Biomass Gasification, Biofuels Production from Algae, Biodiesel Production from Plastics, Effect of Biofuels on IC Combustion Chemistry and Dynamics, Refrigeration Systems, Air Conditioning, Solar Systems Integration, Nano-Tio2 Based Dye Sensitised Solar Cells

Institution

Queensland University of Technology

AddressFaculty of Built Environment and Engineering
2 George St
Brisbane Queensland 4000**Contact person**Professor Kunle Oloyede (Higher Degree Research Director)
Phone: +61 7 3138 2158
Email: k.loyede@qut.edu.au**Name and type of award offered**

Master of Engineering and Doctor of Philosophy

Level of award

Postgraduate degree by research

Target audience

Graduates with first class or upper second-class honours degrees

Frequency of offering

Anytime

Course duration

One to two (MEng) or two to four (PhD) years full-time

Method of study

On-campus

Cost of course

Tuition fees: Australian students, Research Training Scheme (RTS); International students, \$23,000 per year

Website for more information<http://www.qut.edu.au/research/>**Areas of research training**

Energy storage, Solar Thermal Technologies and Applications, Energy System Components (e.g. grid-interactive inverters), Biofuels

Institution

University of Queensland

AddressSchool of Engineering
The University of Queensland
St Lucia, Queensland 4072**Contact details**UQ Graduate School
Phone: +61 7 3365 7932
Email: candidature@research.uq.edu.au**Name and type of award offered**

Master and Doctor of Philosophy

Level of award

Postgraduate degree by research

Target audience

Graduates with first-class or upper second-class honours degrees

Frequency of offering

Thrice yearly

Course duration

Two (MPhil) or four (PhD) years full-time

Method of study

On-campus

Cost of course

Tuition fees: Australian students, Research Training Scheme (RTS); International students, \$28,000 per year

Website for more information<http://www.uq.edu.au/grad-school/>**Areas of research training**

Geothermal Energy, Bagasse, Biodiesel, Bioreactor Landfill, Methanol, Municipal Solid Waste, Sludge

Institution

University of Western Australia

AddressEngineering, Computing and Mathematics
The University of Western Australia
35 Stirling Highway
Crawley, Perth
Western Australia 6009**Contact person**Dr John Livingstone
Phone: +61 8 6488 3099
Email: johnliv@ee.uwa.edu.au**Name and type of award offered**

Master of Engineering Science and Doctor of Philosophy

Level of award

Postgraduate degree by research

Target audience

Graduates with first-class or upper second-class honours degrees

Frequency of offering

Anytime

Course duration

Two (MEng) or three (PhD) years full-time

Method of study

On-campus

Cost of course

Tuition fees: Australian students, Research Training Scheme (RTS); International students, \$26,000 per year

Website for more information<http://www.postgraduate.uwa.edu.au/>**Areas of research training**

Photovoltaics

Institution

University of Southern Queensland

AddressFaculty of Engineering and Surveying
University of Southern Queensland
Toowoomba Queensland 4350**Contact person**

Associate Professor David Buttsworth (Associate Dean (Research))

Phone: +61 7 4631 2614

Email: buttswod@usq.edu.au**Name and type of award offered**

Master of Engineering Research and Doctor of Philosophy

Level of award

Postgraduate degree by research

Target audience

Graduates with first-class or upper second-class honours degrees

Frequency of offering

Twice yearly

Course duration

One and a half (MENR) or three (PhD) years full-time

Method of study

On-campus and external

Cost of course

Tuition fees: Australian students, Research Training Scheme (RTS); International students, \$22,000 per year (on-campus) \$17,600 per year (distance)

Website for more information<http://www.usq.edu.au/research/default.htm>**Areas of research training**

Solar Heating Systems, Photovoltaic, Wind Electricity Generation, Hydrogen Production & Utilization, Fuel Cells, Wave Electricity Generation, Micro-hydro Systems, Heat Pumps

Institution

University of Technology Sydney

AddressUTS: Engineering
University of Technology, Sydney
Building 2, Level 4, City campus
Broadway, Sydney**Contact person**

Dr Dave Dorrell

Phone: +61 2 9514 2425

Email: ddorrell@eng.uts.edu.au**Name and type of award offered**

Master of Engineering and Doctor of Philosophy

Level of award

Postgraduate degree by research

Target audience

Graduates with first-class or upper second-class honours degrees

Frequency of offering

Twice yearly

Course duration

Two (MEng) or three (PhD) years full-time

Method of study

On-campus and external

Cost of course

Tuition fees: Australian students, Research Training Scheme (RTS); International students, \$20,800 per year

Website for more information<http://www.uts.edu.au/research/>**Areas of research training**

Wave, Wind and Solar

Institution

University of Wollongong

AddressFaculty of Engineering
University of Wollongong
Wollongong, NSW 2522**Contact Person**

Assoc Professor Paul Cooper

Phone: +61 2 4221 3355

Email: pcooper@uow.edu.au

Name and type of award offered

Master of Engineering and Doctor of Philosophy

Level of award

Postgraduate degree by research

Target audience

Graduates with first-class or upper second-class honours degrees

Frequency of offering

Twice yearly

Course duration

One and a half (MEng) or three (PhD) years full-time

Method of study

On-campus

Cost of course

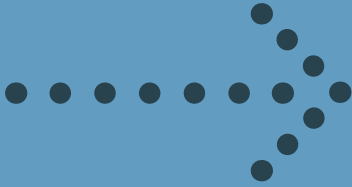
Tuition fees: Australian students, Research Training Scheme (RTS); International students, \$23,040 per year

Website for more information<http://www.uow.edu.au/research/index.html>**Areas of research training**

Bioenergy Production and Bioreactors, Remote Area Water Treatment with Renewable Energy, Wave Energy Conversion, Small Wind Energy Systems, Distributed Generation, Fuel Cells, Organic Photovoltaic Solar Cells, Ultracapacitors for Energy Storage



Clean Energy Council



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