



# Unit Outline (Higher Education)

<b>Institute / School:</b>	Institute of Innovation, Science, and Sustainability
<b>Unit Title:</b>	PRINCIPLES OF RENEWABLE ENERGY SOURCES
<b>Unit ID:</b>	ENGIN2103
<b>Credit Points:</b>	15.00
<b>Prerequisite(s):</b>	(ENGIN1007 for undergraduate Students only)
<b>Co-requisite(s):</b>	Nil
<b>Exclusion(s):</b>	Nil
<b>ASCED:</b>	031301

## Description of the Unit:

This unit provides an introduction to principles of renewable energy. The unit covers different types of renewable and alternative energy sources, and discuss their configurations, basic principles of operation, achievable efficiency, and cost. The impact of the new energy technologies on the environment, obstacles to their wide implementation in industrial and consumer applications, and the role of social attitudes and government planning, financial investments and incentives are also introduced.

**Grade Scheme:** Graded (HD, D, C, P, MF, F, XF)

## Work Experience:

No work experience: Student is not undertaking work experience in industry.

**Placement Component:** No

**Supplementary Assessment:** Yes

Where supplementary assessment is available a student must have failed overall in the Unit but gained a final mark of 45 per cent or above, has completed all major assessment tasks (including all sub-components where a task has multiple parts) as specified in the Unit Description and is not eligible for any other form of supplementary assessment

## Course Level:

Level of Unit in Course	AQF Level of Course					
	5	6	7	8	9	10
Introductory	■	■	■	■	■	■
Intermediate	■	■	✓	■	■	■

Level of Unit in Course	AQF Level of Course					
	5	6	7	8	9	10
Advanced	■	■	■	■	■	■

### Learning Outcomes:

#### Knowledge:

- K1.** Identify different renewable energy systems and describe their suitability based on geographic locations and their environmental impacts.
- K2.** Develop a comprehensive understanding of basic principles of the renewable energy technologies.
- K3.** Recognise and discuss the environmental impact and sustainability of different renewable energy technologies.

#### Skills:

- S1.** Design and integrate energy storage systems.
- S2.** Construct partial and full renewable energy systems.
- S3.** Perform economic analysis and feasibility studies of different renewable energy technologies.

#### Application of knowledge and skills:

- A1.** Interpret the principles of the renewable energy and sustainability to generate electrical power.
- A2.** Apply renewable energy techniques to modify and improve existing engineering systems.
- A3.** Analyse characteristics of different renewable energy technologies.

#### Unit Content:

Topics may include:

- Introduction to renewable electrical energy systems, to include their characteristics, design procedures and economic analysis
- Renewable energy sources - solar PV, wind, fuel cell, marine, hydro, etc.
- Design and analysis of practical renewable electrical energy systems as well as on the distributed generation, recent grid codes and economic analysis of renewable energy sources in the context of smart grid

#### Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1, K2, S2, S3, A2, A3	It aims to consolidate the concepts and principles of renewable energy discussed in the lectures. They will examine students' level of understanding of different renewable energy technologies through constructing partial and full energy systems.	Quizzes/Assignments	20%-30%
K1- K3, S1, A1	For students to prepare technical reports on specified topics to catch up with the state-of-the-art development of renewable energy. This assessment task will promote communication and research skills.	Report	20%-30%
K1-K3, S1, S2, A1, A2	The examination tests analytical and critical thinking and a general understanding of the unit materials.	Test or exam	40%-60%

**Alignment to the Minimum Co-Operative Standards (MiCS)**

The Minimum Co-Operative Standards (MiCS) are an integral part of the Co-Operative University Model. Seven criteria inform the MiCS alignment at a Course level. Although Units must undertake MiCS mapping, there is NO expectation that Units will meet all seven criteria. The criteria are as follows:

1. Co-design with industry and students
2. Co-develop with industry and students
3. Co-deliver with industry
4. FedTASK alignment
5. Workplace learning and career preparation
6. Authentic assessment
7. Industry-link/Industry facing experience

MiCS Course level reporting highlights how each Course embraces the principles and practices associated with the Co-Operative Model. Evidence of Course alignment with the MiCS, can be captured in the Course Modification Form.

**MICS Mapping has been undertaken for this Unit** No

Date:

**Adopted Reference Style:**

Other (IEEE)

Refer to the [library website](#) for more information

Fed Cite - [referencing tool](#)