

[View](#)

Introduction

Over the last several decades, we have become increasingly aware of how our actions affect the world's eco-systems. It has become clear that the environmental choices we make now will have significant short and long term consequences on our ability to exist on the planet.

These findings have resulted in a substantial effort to reduce environmental harm. Governments around world have started developing and implementing strategies to reduce our negative impact on our environment through a variety of initiatives and incentives, designed to promote 'sustainable' practices at home and in the workplace.

This topic explores the causes and effects of environmental harm, as well as the strategies typically used to reduce this harm.

Environmental Sustainability

In relation to the electrotechnology industry, the term 'environmental sustainability' refers to the use of materials, equipment and work practices that aim to reduce any negative effects that the work may have on the environment.



Coastal Environment

Importance

Neglecting sustainable work practices will contribute to an accelerated rate of climate change. The effects of climate change will reduce our ability to survive on the earth, by causing extreme weather and temperatures, rising sea levels, and more frequent natural disasters. In addition, world-wide economic initiatives will steadily increase the cost of using non-sustainable technologies and practices, making non-sustainable businesses unviable.

Economic Benefits

Government initiatives such as Emissions Trading Schemes (ETSs), and previously the carbon tax, are designed to increase the cost of emitting greenhouse gases. The effect of this is to provide an economic incentive for businesses and consumers to adopt sustainable technologies. ?

The benefits of these types of initiatives include:

- Lower carbon emissions
- Increased investment and growth in the sustainable energy sector
- Creation of jobs in the sustainable energy industries
- Increased research, development and production of sustainable technologies
- Reduced cost of purchasing sustainable technologies

On the other hand, a lack of environmental initiatives will result in:

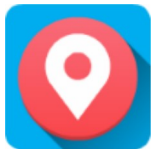
- Increased carbon emissions (to supply our ever increasing need for energy)
- Increased rate of environmental change, including more frequent and severe natural disasters
- Low investment and growth in the sustainable energy sector, resulting in less jobs and lower overall economic prosperity

Check your understanding of the content by clicking on the link below then undertaking the activity.

[Load the Activity](#)



This learning activity consists of 3 parts designed to develop your understanding of environmental sustainability concepts as they relate to the electrotechnology industry.



[Topic 1.1 Learning Activity](#)

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Environmental Management System (EMS)

Environmental risk management is a process similar to health and safety risk management, except that the overall aim is to reduce the risk of damage to the environment.

There are many kinds of environmental hazards associated with electrotechnology work, such as:

- rubbish and waste materials
- the production of dust
- hazardous chemicals
- greenhouse gas emissions
- erosion and sedimentation

The purpose of an Environmental Management System (EMS) is to reduce the chance of environmental damage. An EMS helps an organisation to:

- reduce negative impacts on the environment
- reduce operating costs
- maintain a good public image
- comply with legislation and regulations

ISO 14001

ISO 14001 is an International Standard that provides a voluntary framework for the development and implementation of environmental management systems (EMS).

The basic process of environmental risk management consists of the following steps:

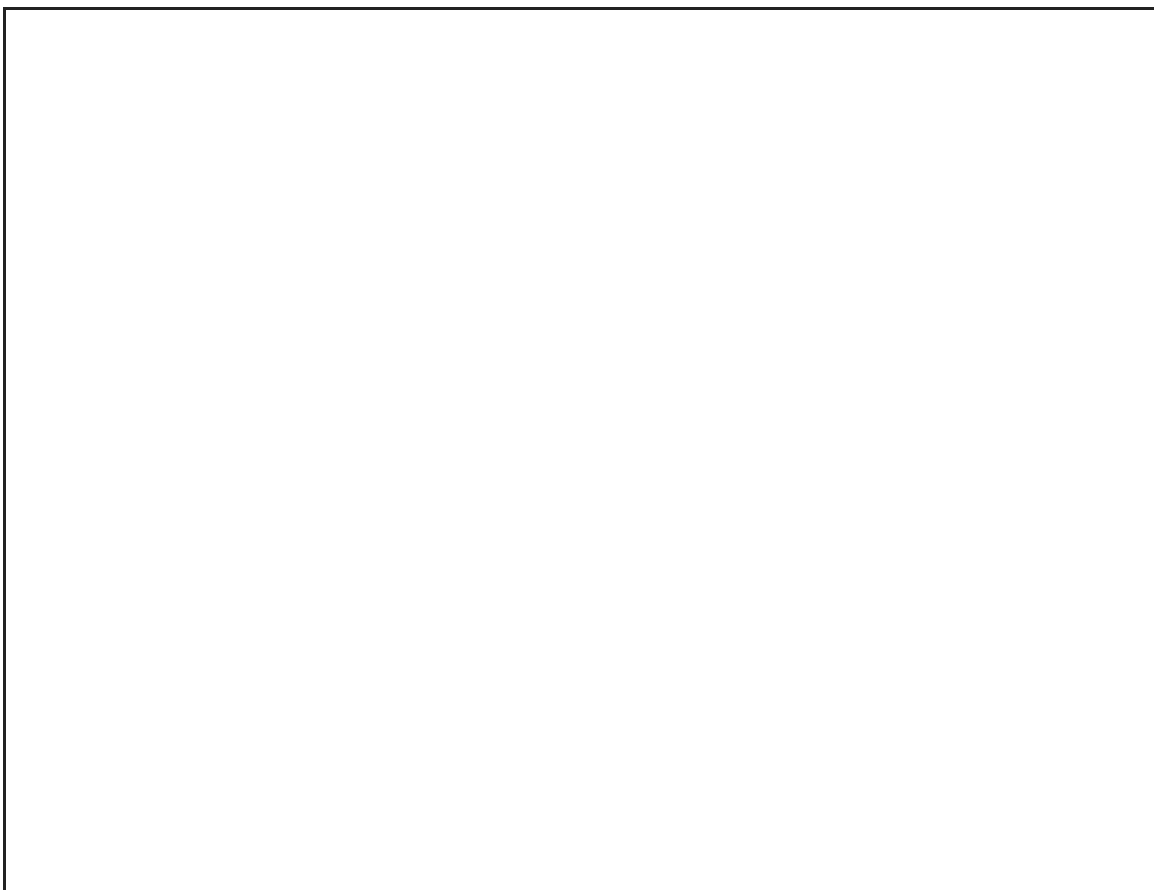
1. Identify environmental hazards and risks
2. Develop measures to control risks to the environment
3. Implement environmental risk control measures
4. Monitor the effectiveness of environmental control measures
5. Review and improve the environmental management system

Watch the following video then undertake the activity.

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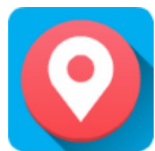
Check your understanding of the content by clicking on the link below then undertaking the activity.

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This learning activity consists of 4 parts designed to develop your understanding of environmental risks typical of electrotechnology work, and systems of environmental risk management.



Topic 1.2 Learning Activity

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The Greenhouse Effect

The 'greenhouse effect' refers to a process whereby the heat radiating out from the Earth's surface is partially reflected back towards the Earth by gases in the atmosphere.

The greenhouse effect is essential to life on Earth, but excessive concentrations of greenhouse gases result in climate change, as more heat is reflected back by the atmosphere. This particular heating effect is referred to as 'global warming' (which is just one aspect of climate change).

Greenhouse Gases	
Water Vapour (H ₂ O) and Clouds	Water vapour and clouds are the largest contributor to the greenhouse effect
Carbon Dioxide (CO ₂)	Carbon dioxide is the second largest contributor to the greenhouse effect Sources of carbon dioxide include: <ul style="list-style-type: none"> burning fossil fuels for transport and electricity generation deforestation – plants release stored carbon dioxide when killed In addition, deforestation reduces the natural effect of carbon dioxide reduction through photosynthesis
Methane (CH ₄)	Methane is the third largest contributor to the greenhouse effect Sources of methane include: <ul style="list-style-type: none"> burning fossil fuels for transport and electricity generation farming – cows and other livestock produce methane naturally mining – release of underground methane reserves into the atmosphere landfill – methane released as waste decomposes
Nitrous Oxide (N ₂ O)	Nitrous Oxide is the fourth largest contributor to the greenhouse effect. Sources of nitrous oxide include: <ul style="list-style-type: none"> burning fossil fuels for transport and electricity generation farming – found in many fertilizers used in the agricultural industries
Ozone (O ₃)	Ozone is the fifth largest contributor to the greenhouse effect Produced as a result of chemical reactions between different gases in the atmosphere

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Chlorofluorocarbons (CFCs)	<p>The sixth largest contributor to the greenhouse effect</p> <p>Sources of chlorofluorocarbons include:</p> <ul style="list-style-type: none">◦ leakage from consumer and industrial products e.g. some refrigerants found in fridges and air-conditioners <p>CFCs used to be used as propellants in aerosol spray cans but are now banned for this purpose</p>
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Watch the following video then undertake the activity.

Check your understanding of the content by clicking on the link below then undertaking the activity.

[Load the Activity](#)



Intergovernmental Panel on Climate Change (IPCC)

The Intergovernmental Panel on Climate Change (IPCC) is an international scientific body, established in 1988, to assess all aspects of climate change. The IPCC is open to all member countries of the United Nations (UN) and World Meteorological Organization (WMO). 195 countries are currently members of the IPCC.

The role of the IPCC is to:

- research and report on climate data
- determine the causes and effects of climate change
- develop strategies to reduce the rate of climate change

Climate Change Policy in Australia

In Australia, climate policy exists at all levels of government. Since taking power, the current Federal Government has abolished the previously established Carbon Tax, and proposed a climate change policy known as "Direct Action".

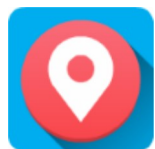
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This learning activity consists of 7 parts designed to develop your understanding of the greenhouse effect, and the national and international initiatives aimed at reducing the rate of climate change.

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Topic 1.3 Learning Activity



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Environmental Legislation

Environmental Legislation in Australia exists at both the Federal and State/Territory levels. The Australian Government's key piece of environmental legislation is called *The Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The EPBC Act provides a legal framework to protect and manage environmental aspects that are nationally and internationally important. The EPBC Act specifies the following as 'matters of national environmental significance':

- Flora
- Fauna
- Ecological communities
- Heritage places

The following diagram shows the various government departments that currently administer environmental legislation in each State and Territory:



State & Territory Environmental Departments

Environmental legislation typically covers issues such as:

- Air, water and noise pollution
- Waste disposal
- Management of vegetation
- Managing hazardous chemicals
- Protected species of plants and animals
- Heritage protection
- Environmental impact of new projects and developments

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Local councils play an important role in ensuring compliance with environmental regulations, and in some cases are empowered to act on the behalf of the regulating authority. The issues dealt with by local councils vary by jurisdiction, but often include:

- Illegal clearing and tree removal
- Illegal filling and earthworks
- Illegal dumping on public reserves
- Water pollution from residential areas and industry
- Sediment and erosion control
- Waste management practices on construction sites

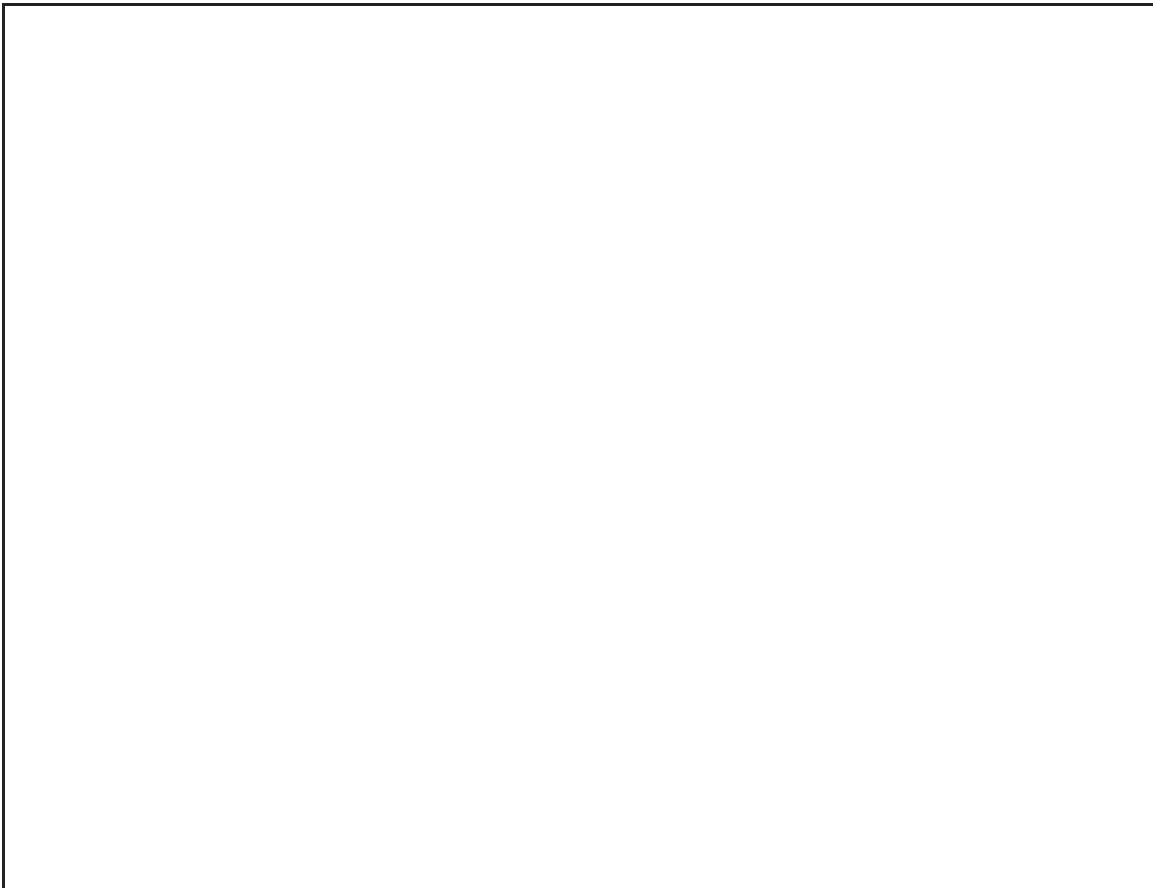
Environmental Policies and Procedures

Issues that are addressed in the environmental policies and procedures of energy sector enterprises typically include:

- Environmental risk assessment
- Waste management and recycling
- Containment of dust
- Noise limits/hours
- Energy conservation
- Handling, storage and containment of chemicals
- Prevention of erosion and sedimentation

Check your understanding of the content by clicking on the link below then undertaking the activity.

[**Load the Activity**](#)



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This skills practice is a 'desktop' style assignment, containing a total of 13 short answer type questions. The questions are designed to develop your understanding of the environmental legislation and regulations in your State or Territory.



Topic 1.4 Skills Practice



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Topic Skills Practice Cover Sheet

Unit Name:	UEERE0001 Apply environmentally and sustainable procedures in the energy sector
Topic Title:	Sustainable Work Practices

Skill Practice Number:	1.4
Skill Practice Name:	Environmental Legislation

Student Name:	
Student ID:	
College/Campus:	
Group:	

Results	
Planning:	
Carryout:	
Completion:	
Overall Results:	
Comments:	

Topic Skills Practice 1.4

UEERE0001 Apply environmentally and sustainable procedures in the energy sector

Topic 1. Sustainable Work Practices

Skills Practice 1.4: Environmental Legislation

Task:

To research and interpret the Federal and State/Territory environmental legislation applicable in your jurisdiction.

Objectives:

At the completion of this skills practice, you should be able to:

- Identify the role of environmental legislation throughout Australia.
- Identify the environmental government departments in your State/Territory.
- Identify the environmental legislation in your State/Territory.
- Identify issues covered under applicable environmental legislation in your State/Territory.
- Identify the responsibilities on individuals and organisations under applicable environmental legislation in your State/Territory.
- Identify the roles of local councils in administering environmental legislation.
- Describe typical environmental policies and procedures used in your workplace.

1. Planning the Unit Skills Test

1.1 Research Environmental Protection Legislation

1.1.1 Use the internet to research Federal and State/Territory legislation and regulation applicable in your jurisdiction.

1.1.2 Once you have located the relevant government department websites and legislation, and/or you feel you have sufficient knowledge of the subject matter, obtain the following materials to assist you with carrying out this skills practice:

- Pens/pencils

Topic Skills Practice 1.4

2. Carrying Out the Skills Practice

2.1 Environmental Protection Legislation

2.1.1 Answer the following questions on the Australian Government's environmental protection legislation.

1. What is the name of the federal government department that administers environmental protection legislation?

2. What is the name of the primary federal level environmental protection legislation?

3. What are the primary objectives of this legislation?

4. What is the name of the State/Territory government department that administers environmental protection legislation in your jurisdiction?

Topic Skills Practice 1.4

5. List eight environmental issues covered by State/Territory level environmental protection legislation in your jurisdiction.




6. List at least three major pieces of State/Territory level environmental protection legislation, and briefly explain the primary purpose of each.

Topic Skills Practice 1.4

7. Select one piece of legislation listed in Question 6, and briefly summarise the major responsibilities that businesses and individuals have under the Act.

8. Do some research and explain how your local council administers the environmental protection legislation from Question 7.

9. Describe at least four examples of environmental protection policies, procedures and work practices that are applicable in your workplace.

	 Feedback	Have your teacher/trainer check your answers	Teacher/Trainer Initials and Date	

Topic Skills Practice 1.4

3. Completing the Skills Practice

3.1 Skills Practice Review Questions

3.1.1 After you have successfully completed the activities in section 2, answer the following topic review questions.



1. What is meant by the term 'environmental sustainability'?

2. Explain the benefits to an organisation of developing and implementing an Environmental Management System (EMS).

3. List at least four greenhouse gases.

Topic Skills Practice 1.4

4. List at least six ways in which humans contribute to the increasing concentration of greenhouse gases in the Earth's atmosphere.

	 Feedback	Have your teacher/trainer check your answers	Teacher/Trainer Initials and Date	

View

Sustainable Work Practices

A sustainable work practice is one that is tailored to reduce any negative effects that the work may have on the environment.

The primary goals of sustainable work practices are to:

- reduce energy usage
- reduce waste

Reducing Energy Usage

Energy usage can be reduced by either using energy more efficiently or by using energy less often.

Reducing Energy Usage	
Method	Examples
Using energy more efficiently	<ul style="list-style-type: none"> • Replacing incandescent lamps with compact fluorescent lamps (CFLs) or LEDs • Replacing inefficient tools and appliances with more energy efficient models • Regular maintenance on energy consuming devices to ensure optimal efficiency • Installing thermal insulation to reduce energy required for heating/cooling
Using energy less often	<ul style="list-style-type: none"> • Switching electrical equipment off when it is not in use • Installing motion sensors to control lighting • Avoiding the use of powered tools and equipment where possible

Reducing Waste

There are three main ways of dealing with waste sustainably, these are:

- Avoidance
- Recovery
- Disposal

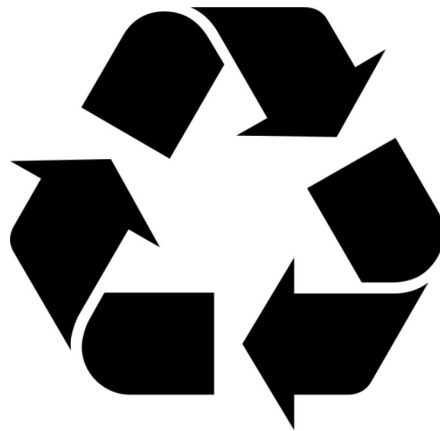
Reducing Waste		
Method	Description	Examples

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Avoidance	Using materials efficiently to reduce the amount of waste being produced	<ul style="list-style-type: none"> • Intelligent measuring and cutting to ensure efficient use of materials
Recovery	Reusing and recycling waste materials	<ul style="list-style-type: none"> • Reusing rather than replacing materials • Recycling materials
Disposal	Discarding waste materials in a way that will be least harmful to the environment	<ul style="list-style-type: none"> • Disposing of waste in the appropriate bins

Recycling

Any waste material that is recyclable should be placed in the appropriate bins for recycling. The following symbol indicates that a material is able to be recycled.



Recyclable materials that are commonly used in the electrotechnology industry include:

- Copper
- Aluminium
- Paper and cardboard
- Transformer oil
- Timber

Classification of Waste

State and Territory regulations classify waste based on its characteristics. These classifications are used to determine how the waste should be disposed of. Classifications vary by jurisdiction. Some typical examples of waste classifications are shown in the table below.

Example of Waste Classifications	
Classification	Examples
General waste – non-biodegradable	Plastics, glass, soiled paper, ceramics, bricks, concrete and metals
General waste – biodegradable	Food scraps, grass cuttings and animal waste
Hazardous waste	Lead paint, Ni-Cd and lead-acid batteries

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Special waste	Tyres, asbestos and medical waste such as syringes and medicines
Recyclable waste	Copper, aluminium, paper and cardboard, timber, transformer oil

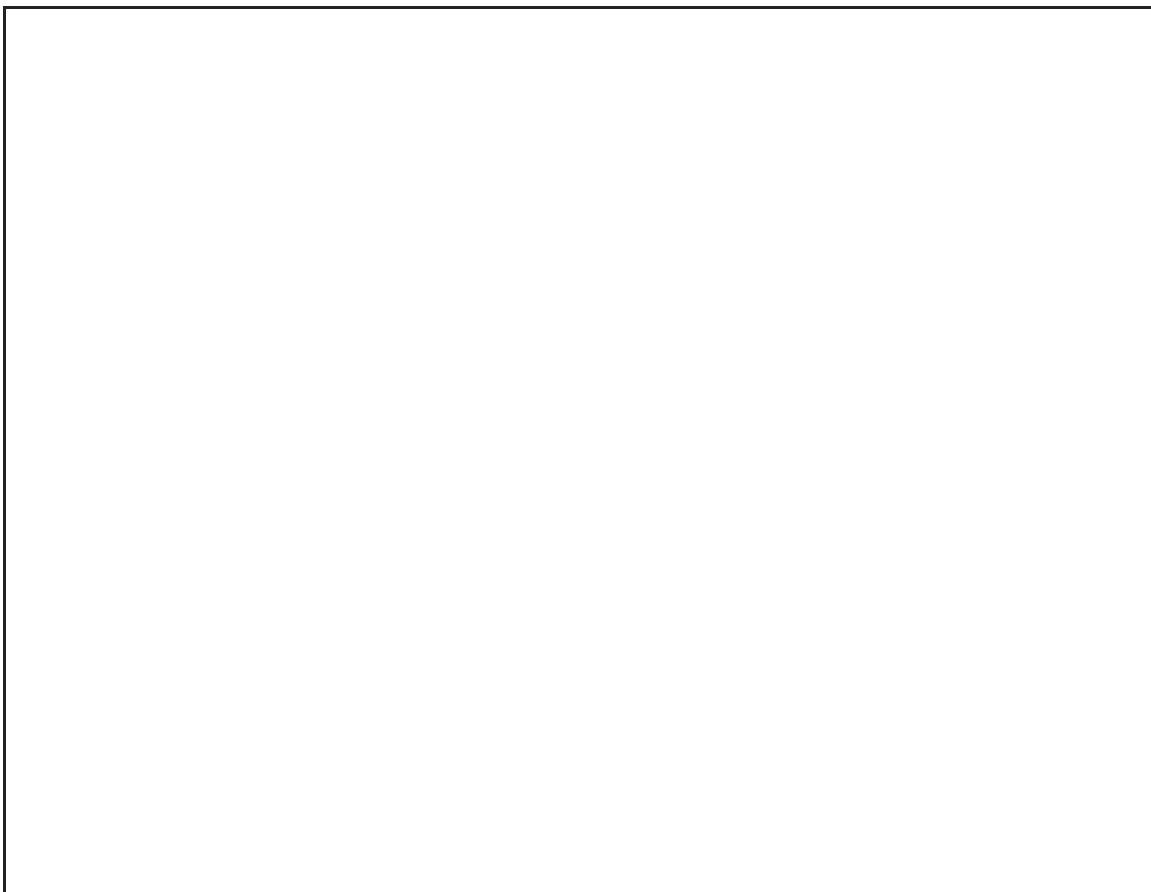
Electrotechnology Worksites

In addition to reducing energy usage and waste, some additional environmental issues that require consideration on typical electrotechnology worksites include:

- Containing dust, waste and hazardous materials within the worksite
- Ensuring noise is only made during the hours permitted by local regulations
- Preventing contaminated water runoff from worksites entering drains and waterways
- Preventing soil eroding from worksites into stormwater drains, roadways and waterways
- Preventing contamination through the use of pesticides to control vegetation

Check your understanding of the content by clicking on the link below then undertaking the activity.

[Load the Activity](#)



This learning activity consists of 7 parts designed to develop your understanding of the sustainable work practices including typical environmental issues affecting electrotechnology sites, types of waste, and methods of reducing waste and energy usage.

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Topic 1.5 Learning Activity

In this skills practice you will carry out a sustainability audit on a workplace and identify areas to minimise waste and energy usage. You will need access to your RTO's practical facilities, so ask your teacher/trainer for further guidance on how to proceed.



Topic 1.5 Skills Practice

Undertaking the following Content Quiz will allow you to check your understanding of sustainability, environmental risk management, the greenhouse effect, environmental legislation and sustainable work practices.



Topic 1 Content Quiz



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Topic Skills Practice Cover Sheet

Unit Name:	UEERE0001 Apply environmentally and sustainable procedures in the energy sector
Topic Title:	Sustainable Work Practices

Skill Practice Number:	1.5
Skill Practice Name:	Sustainable Practices Audit

Student Name:	
Student ID:	
College/Campus:	
Group:	

Results	
Planning:	
Carryout:	
Completion:	
Overall Results:	
Comments:	

Topic Skills Practice 1.5

UEERE0001 Apply environmentally and sustainable procedures in the energy sector

Topic 1. Sustainable Work Practices

Skills Practice 1.5: Sustainable Practices Audit

Task:

To carry out an audit on the sustainable policies and practices of a given workplace, and to identify methods to minimise risks and waste.

*This audit may be carried out on the learner's actual workplace or on the RTO premises.

Objectives:

At the completion of this skills practice, you should be able to:

- Identify environmental/sustainable policies and procedures.
- Identify environmental risks and areas in which efficiency could be improved.
- Document and report suggestions for improving sustainable work practices.

Topic Skills Practice 1.5

1. Planning the Skills Practice

1.1 Equipment

- Workplace installation / scenario (e.g. RTO)

1.2 Suggested Materials

- Calculator

1.3 Miscellaneous Items



- PPE
- Pens / pencils

1.4 Risk Assessment

Risk assessment procedure:

- Identify any hazards that may exist with this skills practice below
- List the supervision level you will be working under - Direct (D), General (G) or Broad (B)
- List the risk classification – High Risk (H), Medium Risk (M) or Low Risk (L)
- List the control measures required for each identified hazard that you need to implement.

Hazard/s Identified	Supervision Level (D, G or B)	Risk Classification (H, M or L)	Control Measure/s

	 Feedback	Have your teacher/trainer check your risk assessment	<table border="1" style="width: 100%;"> <tr> <td style="text-align: center;">Teacher/Trainer Initials and Date</td> </tr> <tr> <td style="text-align: center;"> <div style="font-size: 2em;">✓</div> </td> </tr> </table>	Teacher/Trainer Initials and Date	<div style="font-size: 2em;">✓</div>
Teacher/Trainer Initials and Date					
<div style="font-size: 2em;">✓</div>					



Topic Skills Practice 1.5

2. Carrying Out the Skills Practice

2.1 Sustainable Practices Audit

2.1.1 Your teacher/trainer will provide you with information on the workplace to conduct the audit on. Carry out the audit using the following checklist.

#	Questions	Yes	No	N/A	Comments
1	Does the workplace have an environmental management policy or plan and are people familiar with it?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	Does the workplace have a written sustainability policy and are people familiar with it?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3	Does the workplace have a recycling policy and are people familiar with what can be recycled?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4	Has the workplace made changes to the way it operates for environmental reasons?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5	Does the organization incorporate environmental aspects in their task specific risk assessments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6	Does the workplace have facilities for recycling and are they being used?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
7	Are there more opportunities for recycling in the workplace?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
8	Does the workplace purchase materials in the smallest quantities needed to avoid over-ordering?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
9	Does the workplace dispose of hazardous chemicals appropriately and in accordance with the regulations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10	Has the workplace taken steps to reduce the use of toxic chemicals and use less toxic alternatives wherever possible?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

		<p>Have your teacher/trainer check your work</p> <p><i>Feedback</i></p>	<p>Teacher/Trainer Initials and Date</p>	

Topic Skills Practice 1.5

3. Completing the Skills Practice

3.1 Skills Practice Review Questions

3.1.1 Once you have completed Section 2, answer the following questions in relation to the audit, and discuss your answers with your teacher/trainer.

1. What are the key sustainable practices and procedures currently used at the workplace?

2. What areas could be improved in relation to the sustainability practices in the workplace?

3. Provide some suggestions on how each of these identified areas could be improved.

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Introduction

The term 'sustainable energy' refers to energy that can be used without having an overall detrimental effect on the environment. This goal can be achieved by obtaining energy from renewable sources and by using energy efficiently.

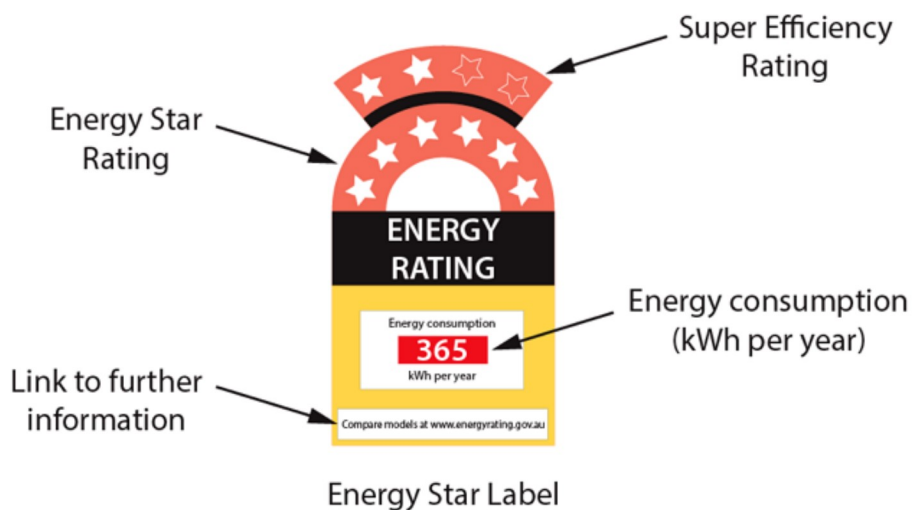
This topic explores the current trends in achieving sustainability, including general techniques for reducing waste and energy consumption, the role of governments and other organisations, the benefits of sustainable living, and renewable energy technologies.

MEPS and Energy Star Ratings

In the interests of sustainability, the Greenhouse and Energy Minimum Standards (GEMS) Act 2012 requires various electrical items to comply with Minimum Energy Performance Standards (MEPS).

MEPS specify the minimum level of energy performance required for various appliances and equipment sold in Australia. For example, if a manufacturer produces an electric water heater that does not comply with MEPS, then the product cannot be sold in Australia. The effect is to reduce overall energy consumption, and give an economic incentive for manufacturer's to innovate.

Included in this framework is the 'Energy Star' rating system, which requires certain appliances to be labelled to identify their efficiencies. The rating system is intended to inform consumer's so that they can make more energy efficient choices. In turn, this gives further economic incentive to manufacturers to design more energy efficient products.



The following table shows the MEPS and Energy Star requirements that apply to various electrical items under the current GEMS legislation.

MEPS and Energy Star Labeling Requirements		
Electrical Appliances	MEPS	Energy Rating
Refrigerators and freezers	✓	✓

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Single phase air conditioners	✓	✓
Televisions	✓	✓
Dishwashers	✗	✓
Washing machines	✗	✓
Clothes dryers	✗	✓
Electric water heaters	✓	✗
Three phase electric motors	✓	✗
Electric ovens	✗	✗

Check your understanding of the content by clicking on the link below then undertaking the activity.

[Load the Activity](#)



Australian Government Initiatives

Historically, the Australian government has implemented a number of initiatives aimed at achieving sustainability. Some of these have included:

- rebates for installing thermal insulation in your home, reducing energy losses through walls and ceilings
- rebates for installing solar PV systems, reducing the ever increasing need for fossil-fuels

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- a tax on carbon, providing an economic incentive to reduce emissions and increase efficiency
- funding for renewable energy research and development projects

Building Code of Australia (BCA)

The Building Code of Australia (BCA) specifies minimum standards for safety, health, amenity and sustainability of buildings, and has been given the status of building regulation by all Australian States and Territories.

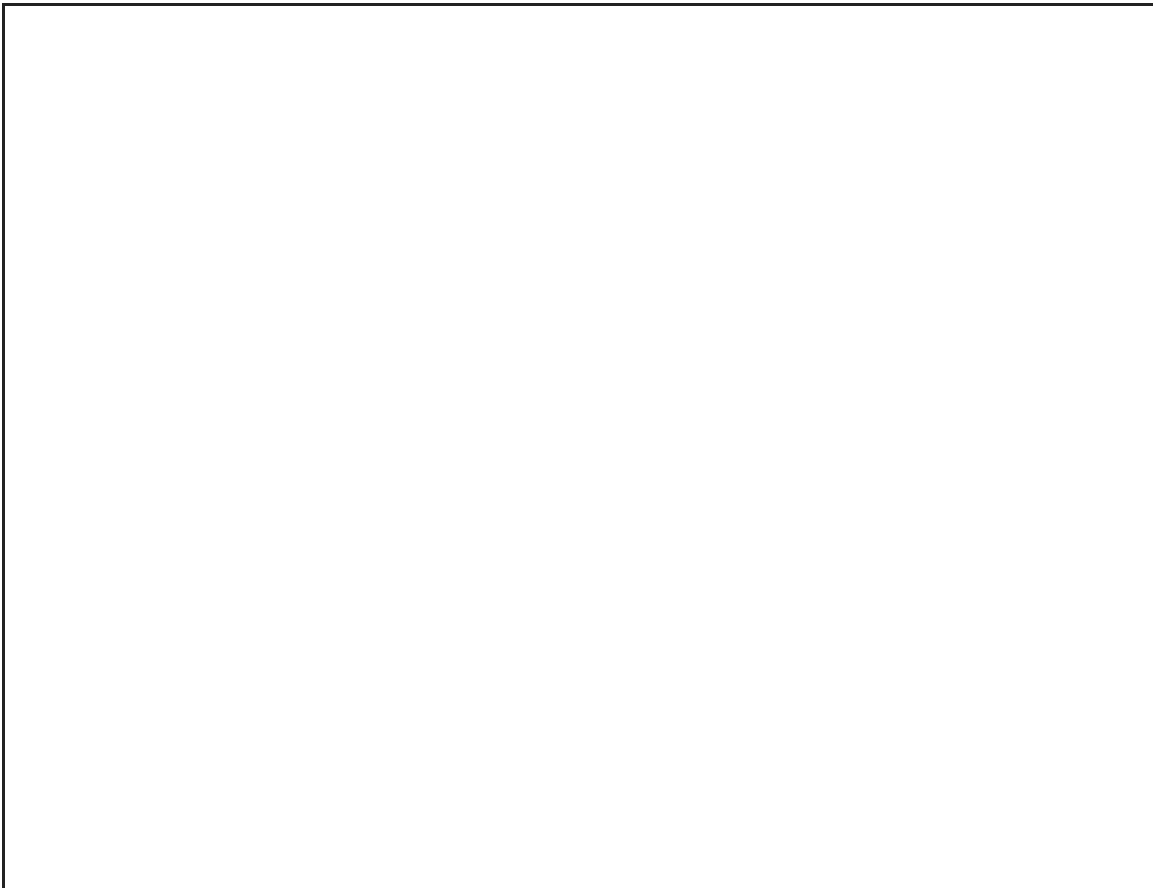
For this reason, there are several aspects of electrical installations that are affected by the BCA, and one of them is energy efficiency.

For example, the BCA requires that the lighting installation in a new residential home must not exceed:

- 5 watts per square metre (W/m^2) indoors
- 4 watts per square metre (W/m^2) outdoors
- 3 watts per square metre (W/m^2) in garages

Check your understanding of the content by clicking on the link below then undertaking the activity.

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Electrical Demand

Electrical devices make our lives more comfortable and convenient, but as electrical technology grows and evolves, so does the demand for energy. The following table explains some of the industry terminology used to describe various concepts of the 'demand' for electricity.

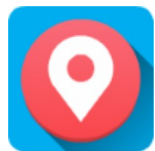
Electrical Energy Terms and Definitions

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Maximum demand	The maximum amount of electrical energy that can reasonably be expected to be used by a given electrical installation at any one time
Network demand	The average amount of electrical energy that needs to be supplied by an electricity distributor over a period of time
Peak demand	The maximum amount of electrical energy that needs to be supplied by an electricity distributor at any one time.
Tariff	The cost of electricity, expressed as a rate of charge, usually in cents per kilowatt-hour (c/kWh)

This learning activity consists of 8 parts designed to develop your understanding of sustainability in Australia, including:

- Techniques used to reduce carbon emissions
- Government initiatives and regulations
- MEPS and Energy Star labelling
- Industry terminology



Topic 2.1 Learning Activity

In this skills practice you will carry out an energy audit on a workplace and identify areas to minimise carbon based energy usage. You will need access to an actual or simulated workplace, so ask your teacher for further details, and about where to obtain any required personal protective equipment (PPE).



Topic 2 Skills Practice



Last modified: Tuesday, 4 April 2023, 10:30 AM

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Topic Skills Practice Cover Sheet

Unit Name:	UEERE0001 Apply environmentally and sustainable procedures in the energy sector
Topic Title:	Reduction of Carbon Based Energy Sources

Skill Practice Number:	2.1
Skill Practice Name:	Energy Audit

Student Name:	
Student ID:	
College/Campus:	
Group:	

Results	
Planning:	
Carryout:	
Completion:	
Overall Results:	
Comments:	

Topic Skills Practice 2.1

UEERE0001 Apply environmentally and sustainable procedures in the energy sector

Topic 2. Reduction of Carbon Based Energy Sources

Skills Practice 2.1: Energy Audit

Task:

To carry out an audit on the energy usage at a given workplace, and to identify methods to reduce reliance on carbon-based energy.

*This audit may be carried out on the learner's actual workplace or on the RTO premises.

Objectives:

At the completion of this skills practice, you should be able to:

- Identify sources and applications of energy.
- Identify opportunities for reducing reliance on carbon based energy.
- Document and report suggestions for improvement.

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Energy Efficient Retrofits

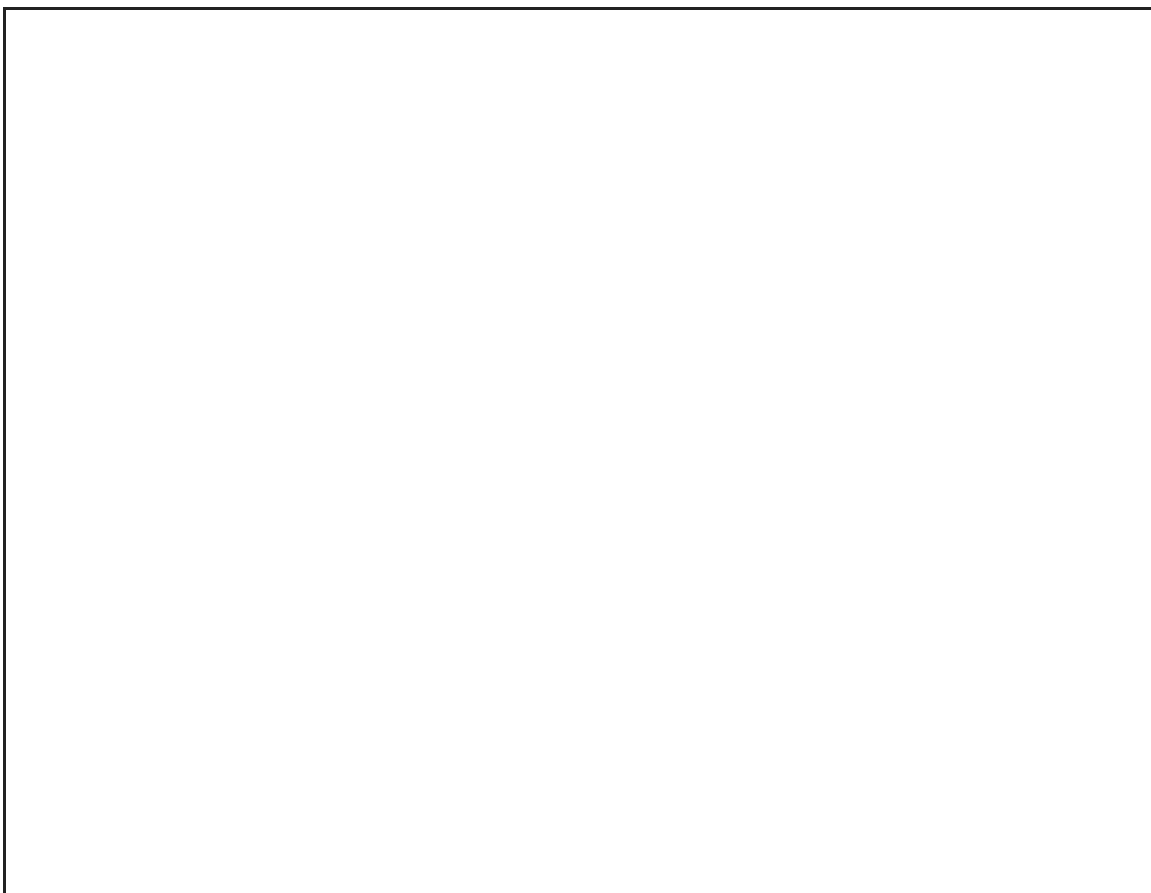
An energy efficient retrofit involves altering various parts of an existing building to make it more energy efficient, thereby reducing its negative impact on the environment. The methods commonly used to improve the energy efficiency of buildings are detailed in the following table.

Energy Efficient Retrofits	
Method	Examples
Reducing the usage of energy consuming equipment	<ul style="list-style-type: none"> • Installing sensors and timers to de-energise equipment when it is not needed • Installing skylights to reduce the need for artificial lighting
Reducing the amount of energy needed to operate equipment	<ul style="list-style-type: none"> • Replacing incandescent lamps with compact fluorescent lamps (CFL) or with LED lamps, which are even more efficient • Replacing existing appliances with more energy efficient models
Reducing energy losses	<ul style="list-style-type: none"> • Installing thermal insulation in walls, ceilings and under floors • Double glazing windows to prevent heat loss or transfer • Sealing doors, windows and the like to prevent drafts
Reducing reliance on fossil-fuels	<ul style="list-style-type: none"> • Installing solar hot water heating systems • Installing photovoltaic (PV) arrays

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This learning activity consists of 2 parts designed to develop your understanding of energy efficient retrofitting techniques.

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[Topic 2.2 Learning Activity](#)



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Last modified: Tuesday, 4 April 2023, 11:26 AM

View

Renewable Energy

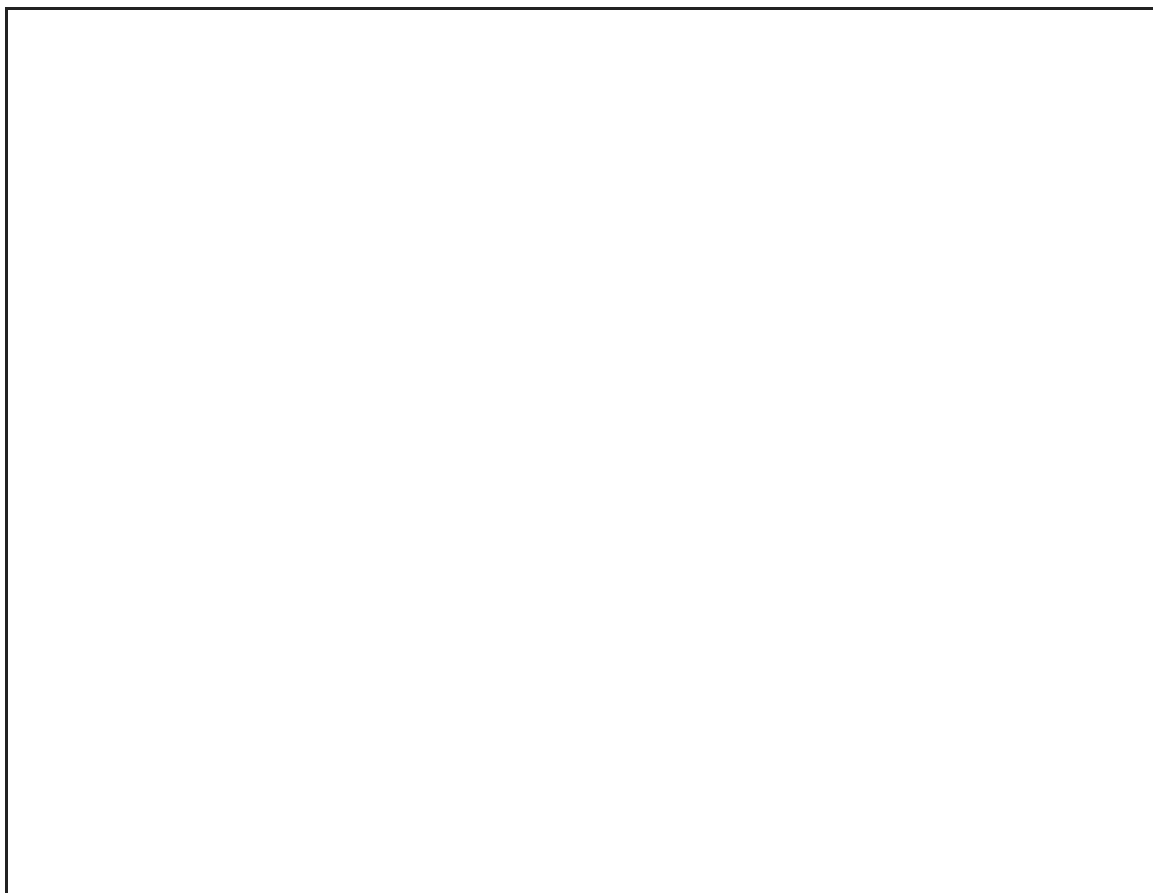
Renewable energy is another path to sustainability. A renewable energy source is one that can be harnessed from natural resources that do not become depleted. Various renewable energy technologies are detailed in the following table.

Renewable Energy Technologies	
Type	Description
Hydro	The controlled flow of water (at a dam) is used to rotate a turbine
Wind	Natural air flow is used to rotate a turbine
Solar PV	Radiant light from the sun is converted into electricity by a semi-conductor solar "array"
Solar thermal	Radiant heat from the sun is used to heat water
Wave	The rising and falling motion of a buoy is used to pump water and generate electricity
Tidal	The natural tidal movement of water is used to rotate a turbine
Geothermal	Heat energy from within the earth is used to produce steam which is then used to rotate a turbine
Biomass	Gases from decomposing plant and animal matter is used to rotate a turbine

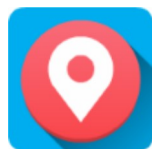
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Check your understanding of the content by clicking on the link below then undertaking the activity.

[Load the Activity](#)

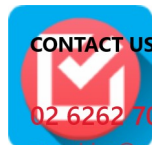


This learning activity consists of 1 part designed to develop your understanding of the various renewable energy sources currently utilised around the world.



[Topic 2.3 Learning Activity](#)

Undertaking the following Content Quiz will allow you to check your understanding of sustainability in Australia, renewable energy technologies, and energy efficient retrofitting techniques.



[Topic 2 Content Quiz](#)

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Last modified: Wednesday, 5 April 2023, 2:02 PM

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