

1. Module details

Module name

Domestic Appliance Energy Efficient Technologies

Suggested structured learning time

A learner possessing the prerequisite skills and knowledge should achieve the module purpose in 18 to 20 hours.

Module code

NUE147

Field of Education code

031315

2. Module purpose

This module provides the knowledge to identify the reasons for energy efficient technology as it relates to the domestic appliance industry.

Learners will gain an understanding of the need for and the types of energy efficient technologies available to the domestic appliance industry.

It covers the reasons for energy efficient domestic appliances, sustainable energy sources, energy efficient rating scales and current energy efficient technologies available in the domestic appliance market.

3. Learning pathway

Intended use in the structured learning program

This module is intended to supplement extensive workplace exposure to domestic appliance servicing work. In particular it applies to both current and future domestic appliance energy efficient technology. Therefore before undertaking this module an apprentice should have a clear understanding and experience of:

- diagnosing and fault repairs associated with domestic refrigerators and freezers
- servicing and fault finding small kitchen appliances
- maintenance, testing, fault finding and repairs of domestic microwave ovens
- installing, commissioning, servicing, fault finding and repairs of room air conditioners.

Recommended prerequisites

For the most effective learning this module should be undertaken only after modules in Domestic Refrigerators and Freezers; Small Kitchen Appliances; Microwave Ovens and Room Air Conditioners have been completed.

4. Relationship to competency standards

This module provides part of the underpinning knowledge and skills in the ‘Evidence Guide’ of specific units of competency in the National Electrotechnology Training Package and provides similar support, where mapped, to equivalent units in the National Metals and Engineering Competency Standards. For details refer to the module to unit maps, available from EEQSBA.

5. Content

Summary of content

1. Reasons for the need to produce energy efficient domestic appliances
 - Greenhouse effect / Global warming
 - Long term reduction of energy producing resources (coal, petrol, natural gas, etc)
2. Sustainable energy sources for domestic consumption
 - Solar
 - Photovoltaic
 - Wind
 - Wave
 - Biomass, etc
3. Energy efficient labelling
 - Energy star program
 - Greenhouse friendly rating
4. Domestic appliance energy efficient technologies
 - Design (Manufacturing cost reductions)
 - Production
 - Materials
 - Minimisation of electrical use (running cost reductions)
 - Energy efficient products
 - Air conditioners
 - Refrigerators
 - Solid state refrigeration
 - Heating appliances
 - Dishwashers
 - Cooking appliances
 - Washing machines
 - Dryers
 - Inverters and d.c. motors

6. Assessment strategy

Assessment methods	Assessment should be progressive reflecting a holistic approach to ensure the module is met. To assist in ensuring validity, reliability and fairness assessment instruments should include practical exercises, assignments and written tests consisting of item types, such as multiple choice, short answer and problem solving.
Conditions of assessment	Normally learning and assessment will take place in a formal learning environment.
7. Learning outcome details	
Learning outcome 1	Identify and describe the reasons for manufacturers to produce energy efficient domestic appliances.
Assessment criteria	1.1 Identify and describe the reasons to produce energy efficient domestic appliances.
Learning outcome 2	Identify and describe alternative energy sources available to the domestic consumer.
Assessment criteria	2.1 Identify and describe the alternative energy sources currently available for installation and use by the domestic consumer. 2.2 Identify and describe the alternative energy sources currently available for supply into the National / State electrical grid system.
Learning outcome 3	Identify and describe the rating systems used by manufacturers to demonstrate the efficiency of their domestic appliances.
Assessment criteria	3.1 Identify and describe the different rating systems used by manufacturers of domestic appliances. 3.2 Identify how the rating system came about - compulsory or voluntary. 3.3 Identify how the appliance rating is determined. 3.4 Identify energy efficient awards available to energy efficient appliance manufacturers.
Learning outcome 4	Identify and describe the energy efficient technologies either currently under research or recently placed into production by domestic appliance manufacturers and designers.
Assessment criteria	4.1 Identify and describe energy efficient technologies currently under research by domestic appliance manufacturers and designers.

8. Delivery of the module

Delivery strategy

- 4.2 Identify and describe energy efficient technologies that have recently been placed into production by domestic appliance manufacturers and designers.
- 4.3 Describe the operation of inverters
- 4.4 Identify inverter ratings

Delivery strategies must be suitable for learning both theoretical and practical aspects described in the module purpose. It is considered that the most effective method to achieve this is by integration of theory and practice where students learn by experimentation, research and reports. It is recommended that learning and assessment be facilitated in a holistic manner that may require a learning outcome sequence other than that indicated in the module.

Resource requirements

Resources should be sufficient for students to carry out exercises on an individual basis.

Useful references include:

Standards Australia, Standards New Zealand:

AS/NZS 3760 (Latest edition) *In-service Safety Inspection and Testing of Electrical Equipment*

AS/NZS 4836 (Latest edition) *Safe Working Practice on Low-voltage Electrical Installations*

WorkCover NSW, *WorkCover Code of Practice - Low Voltage Electrical Work Local electricity distributor and authority regulations*

Internet Addresses

www.pcapliancerepair.com

Where this module is used in an approved Traineeship or Apprenticeship program learners should be advised to obtain, where available, respective EE-Oz Training Standards¹ **User Guides** (these outline in detail what training and work performance the Learner is required to undertake for the program).

¹ EE-Oz Training Standards – ElectroComms and EnergyUtilities Industry Skills Council Ltd formally EEQSBA

**Occupational health
and safety requirements**

A safe and healthy environment will be provided for learners and teachers. Safety procedures for the particular learning facilities shall be followed as part of the learning / teaching activity and assessment.