Title	**Demonstrate technical knowledge of and evaluate resource efficiency options for energy**		
Level	**5**	**Credits**	**20**

Purpose	This unit standard is for people who may be working as resource efficiency programme managers and consultants. People credited with this unit standard are able to demonstrate technical knowledge of energy sources and energy measurement, and evaluate resource efficiency options for energy.

Classification	Zero Waste > Resource Efficiency

Available grade	Achieved

Guidance Information

1 Legislation and documents that apply to this unit standard include:
Climate Change Response Act 2002;
Ozone Layer Protection Act 1996;
Resource Management Act 1991;
Guidelines for the Management of Work in Extremes of Temperature (Wellington: Department of Labour, 1997);
AS/NZS ISO 31000: 2018 *Risk management – Guidelines*;
NZS 4218:2009 *Thermal insulation – Housing and small buildings;*
NZS 4220:1982 *Code of practice for energy conservation in non-residential buildings*;
NZS 4243.2:2007 *Energy efficiency – Large buildings – Lighting*;
NZS 4303:1990 *Ventilation for acceptable indoor air quality*;
Guidelines for the Provision of Facilities and General Safety and Health in Commercial and Industrial Premises (Wellington: Department of Labour, 1995);
manufacturer's instructions for energy measuring equipment;
local authority rules and consents;
safety data sheets.

2 Definition
Organisation refers to an entire business entity in the private or public sector or a business unit within the organisation.

Outcomes and performance criteria

Outcome 1

Demonstrate technical knowledge of sources of energy.

Performance criteria

1.1 Major sources of energy are compared in terms of their use and availability.

Range electricity, gas, coal, diesel, liquid petroleum gas, wood, wood waste, petrol.

1.2 Sources of energy are described in terms of production systems for renewable sources of energy and any barriers to their use.

Range two of – solar, photovoltaic, wind, geothermal, biomass.

1.3 Requirements for the supply and, where relevant, storage of energy for use by organisations is described and illustrated with reference to organisational activities.

Range evidence is required for small, medium, and large organisations.

Outcome 2

Demonstrate technical knowledge of energy measurement.

Performance criteria

2.1 Terminology used for measuring energy is defined in accordance with New Zealand Standards 4218, 4220, and 4243 and methods for collecting accurate measurements for energy audits are explained in accordance with New Zealand Standards 4218, 4220, and 4243.

Range watt, kilowatt, megawatt, amp, volt; kilowatt/hour, gigajoule, kilovolt amps, power factor, Celsius, Fahrenheit, lumen, lux, kilograms per hour.

2.2 Energy measurement is explained in terms of selecting appropriate units of measurement for different types of energy and different sizes of organisations.

Range at least three types of energy;
organisation – small, medium, large.

2.3 Energy measuring equipment is described and its use explained in accordance with manufacturer’s instructions.

Range electricity meter, gas meter, thermometer, infrared pointer, anemometer, carbon dioxide meter, hygrometer, lux meter.

Outcome 3

Evaluate resource efficiency options for energy.

Performance criteria

3.1 The options for improving energy performance for an organisation's buildings are evaluated in accordance with NZS 4220.

Range three of – ecodesign, building materials, equipment selection, staff awareness, power down software, equipment management software, building management software.

3.2 The options for efficient energy use are evaluated and prioritised in one or more organisations in accordance with recommended standards, texts and websites.

Range six of – energy efficient lighting; efficient use of energy for space heating, water heating, ventilation, air conditioning systems; energy efficient controls; efficient use of steam energy; efficient use of boilers and process heating systems; energy efficient refrigeration;
evaluation of options for lighting includes calculation of energy density.

3.3 The evaluation takes account of legislative and local authority requirements relating to energy.

Planned review date	31 December 2023

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	17 June 2011	31 December 2015
Revision	2	21 November 2013	N/A
Rollover and Revision	3	28 June 2018	N/A

Consent and Moderation Requirements (CMR) reference	0014

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

Comments on this unit standard

Please contact MITO New Zealand Incorporated info@mito.org.nz if you wish to suggest changes to the content of this unit standard.