

<b>Title</b>	<b>Demonstrate knowledge of and analyse energy efficiency of buildings and plant</b>		
<b>Level</b>	<b>4</b>	<b>Credits</b>	<b>5</b>

<b>Purpose</b>	<p>This unit standard is intended for use in the training and assessment of electricians beyond trade level and covers the knowledge of energy efficiency and methods of analysing energy efficiency of domestic, industrial, and commercial buildings. Electricians who have achieved this unit standard are able to conduct an energy audit on an installation.</p> <p>People credited with this unit standard are able to:</p> <ul style="list-style-type: none"> <li>– demonstrate knowledge of energy efficiency as related to industrial, commercial, residential, and domestic installations;</li> <li>– demonstrate knowledge of non-renewable and renewable energy sources;</li> <li>– demonstrate knowledge of data collection and analysis techniques as related to undertaking energy audits;</li> <li>– gather data for the analysis of energy efficiency; and</li> <li>– analyse energy consumption data and report energy audit results.</li> </ul>
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<b>Classification</b>	Electrical Engineering > Electrotechnology
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<b>Available grade</b>	Achieved
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**Guidance Information**

- 1 This unit standard has been developed for learning and assessment off-job.
- 2 **References**  
 Building Act 2004;  
 Consumer Guarantees Act 1993;  
 Electricity Act 1992;  
 Electricity (Safety) Regulations 2010;  
 Energy Efficiency and Conservation Act 2000;  
 Fair Trading Act 1986;  
 Health and Safety at Work Act 2015;  
 Privacy Act 2020;  
 Resource Management Act 1991;  
 and all subsequent amendments and replacements.

- 3 Definition  
*Industry practice* – those practices that competent practitioners within the industry recognise as current industry best practice.
- 4 All activities must comply with: any policies, procedures, and requirements of the organisations involved; the standards of relevant professional bodies; and any relevant legislative and/or regulatory requirements.
- 5 *Data collection methods* may include but are not limited to – surveys, automated data collection, physical measurements.
- 6 Data may be simulated from given case studies or projects.

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## Outcomes and performance criteria

### Outcome 1

Demonstrate knowledge of energy efficiency as related to industrial, commercial, residential, and domestic installations.

Range may include but is not limited to – lighting, heating, cooling, communication, processes.  
evidence of three is required for one of – buildings, plant, machinery.

### Performance criteria

- 1.1 Energy efficiency is described in general terms, and current methods of energy efficiency improvement in relation to the electrical installations are explained.
- 1.2 The purpose of energy audits is explained in relation to energy efficiency improvements.
- 1.3 The Energy Star standard for energy efficiency is explained in accordance with its application in New Zealand.  
  
Range origin, standing, specifications; appliances, heating and cooling systems, electronic systems, lighting, buildings.
- 1.4 The International Energy Agency's One Watt Initiative is explained in accordance with industry practice.
- 1.5 Power management systems are described in accordance with industry practice.  
  
Range operating costs, noise, energy requirements, cooling.

### Outcome 2

Demonstrate knowledge of non-renewable and renewable energy sources.

**Performance criteria**

- 2.1 Renewable energy is defined in accordance with industry practice.
- 2.2 Three non-renewable energy sources are identified and methods of harnessing these sources of energy are described.
- 2.3 Three renewable energy sources are identified and methods of harnessing these sources of energy are described.
- 2.4 Advantages and disadvantages of renewable energy sources versus non-renewable energy sources are explained.

Range evidence is required for three advantages and three disadvantages of each energy source.

**Outcome 3**

Demonstrate knowledge of data collection and analysis techniques as related to undertaking energy audits.

**Performance criteria**

- 3.1 Data collection techniques are explained in accordance with industry practice for energy audits.

Range energy audit plan preparation, energy consumption, data collection and validation.

- 3.2 Data analysis techniques are explained in accordance with the requirements of the energy audit plan.

**Outcome 4**

Gather data for the analysis of energy efficiency.

**Performance criteria**

- 4.1 Data are collected, validated, and recorded in accordance with the requirements of the energy audit plan.

Range requirements include but are not limited to – adherence to sampling rate, timeframes, data collection methods, measuring equipment.

- 4.2 Checks review the validity of recorded data and corrective action is taken if required.

Range self-checks, independent checks.

- 4.3 Data storage and/or disposal methods conform to confidentiality and security requirements.

**Outcome 5**

Analyse energy consumption data and report on energy audit results.

**Performance criteria**

- 5.1 Data are analysed in accordance with energy audit plan requirements.
- Range requirements may include but are not limited to – recording timeframe, completeness, legibility, accuracy, sustainability, traceability, consistency. evidence of four is required.
- 5.2 Data analysis calculations are verified as correct and meeting energy audit plan requirements, and are recorded in accordance with the energy audit plan.
- 5.3 Recommendations based on energy audit findings are reported to the customer.

**This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.**

**Status information and last date for assessment for superseded versions**

Process	Version	Date	Last Date for Assessment
Registration	1	19 June 2009	31 December 2024
Rollover and Revision	2	15 March 2012	31 December 2024
Revision	3	15 January 2014	31 December 2024
Rollover and Revision	4	25 March 2021	31 December 2024
Review	5	2 March 2023	31 December 2024

**Consent and Moderation Requirements (CMR) reference**

0003

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