

<b>Title</b>	<b>Demonstrate knowledge of electrical power, energy, cost of consumption, and inductors and capacitors in AC circuits</b>		
<b>Level</b>	<b>4</b>	<b>Credits</b>	<b>4</b>

<b>Purpose</b>	<p>People credited with this unit standard are able to demonstrate knowledge of:</p> <ul style="list-style-type: none"> <li>• electrical power, energy, and cost of consumption;</li> <li>• inductors and capacitors in AC circuits.</li> </ul> <p>This unit standard partially fulfils the requirements for registration for line mechanics with the Electrical Workers Registration Board.</p>
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<b>Classification</b>	Electricity Supply > Electricity Supply - Core Skills
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<b>Available grade</b>	Achieved
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### Guidance Information

- 1 This unit standard underpins one of the capstone assessments for registration with the EWRB for Distribution Line Mechanics.
- 2 Evidence presented for assessment against this unit standard must be consistent with safe working practices and be in accordance with applicable industry and legislative requirements.
- 3 Legislation, regulations and/or industry standards relevant to this unit standard include but are not limited to the:
  - Health and Safety at Work Act 2015
  - Electricity Act 1992
  - Electricity (Safety) Regulations 2010; and any subsequent amendments and replacements;
  - Electricity supply industry codes of practice and documented enterprise procedures, including Electricity Engineers' Association *Safety Manual – Electricity Industry* (SM-EI) (current version), and relevant EEA guides available from [www.eea.co.nz](http://www.eea.co.nz).

#### 4 Definitions

AC means alternating current.

*Asset owner* refers to a participant who owns or operates assets used for generating or conveying electricity.

*Industry requirements* include all asset owner requirements and standards; manufacturers' specifications; and enterprise requirements which cover the documented workplace policies, procedures, specifications, business and quality management requirements relevant to the workplace in which assessment is carried out.

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## Outcomes and performance criteria

### Outcome 1

Demonstrate knowledge of electrical power, energy, and cost of consumption.

#### Performance criteria

- 1.1 Electrical power is defined in terms of voltage, current, and resistance, with units and symbols stated.
- 1.2 Electrical energy is defined in terms of power and time taken, with units and symbols stated.
- 1.3 Costs of consumption of electrical energy are calculated from given data for simple domestic installations and expressed in kilowatt-hours and dollars.

### Outcome 2

Demonstrate knowledge of inductors and capacitors in AC circuits.

#### Performance criteria

- 2.1 Characteristics and effects of inductors in AC circuits are described.  
  
Range inductive reactance, phase relationship between supply current and voltage.
- 2.2 Practical applications of inductors in AC circuits are described.  
  
Range current limiting, voltage control.
- 2.3 Characteristics and effects of capacitors in AC circuits are described.  
  
Range capacitive reactance, phase relationship between supply voltage and current.
- 2.4 Practical applications of capacitors in AC circuits are described.  
  
Range power factor correction, reducing of arcing, voltage control.

- 2.5 The dangers and safety requirements of using inductors and capacitors in AC power circuits are explained.
- 2.6 Impedance is defined in terms of the combined effects of resistance and reactance in an AC circuit.

<b>Planned review date</b>	31 December 2025
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#### Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	20 March 2014	31 December 2021
Review	2	28 November 2019	31 December 2023
Review	3	26 May 2022	N/A

<b>Consent and Moderation Requirements (CMR) reference</b>	0120
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

#### Comments on this unit standard

Please contact Waihangā Ara Rau Construction and Infrastructure Workforce Development Council [qualifications@WaihangāAraRau.nz](mailto:qualifications@WaihangāAraRau.nz) if you wish to suggest changes to the content of this unit standard.