



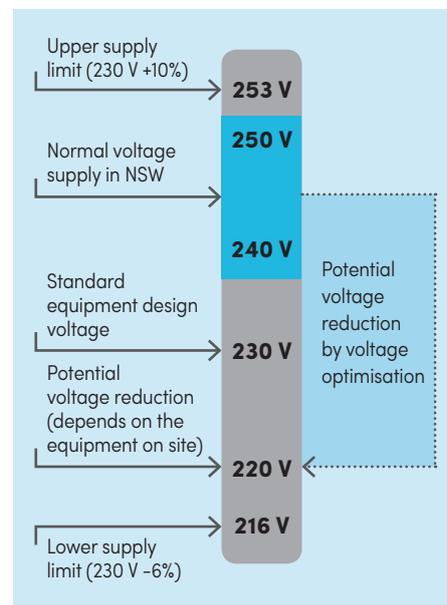
# Voltage optimisation

## What is voltage?

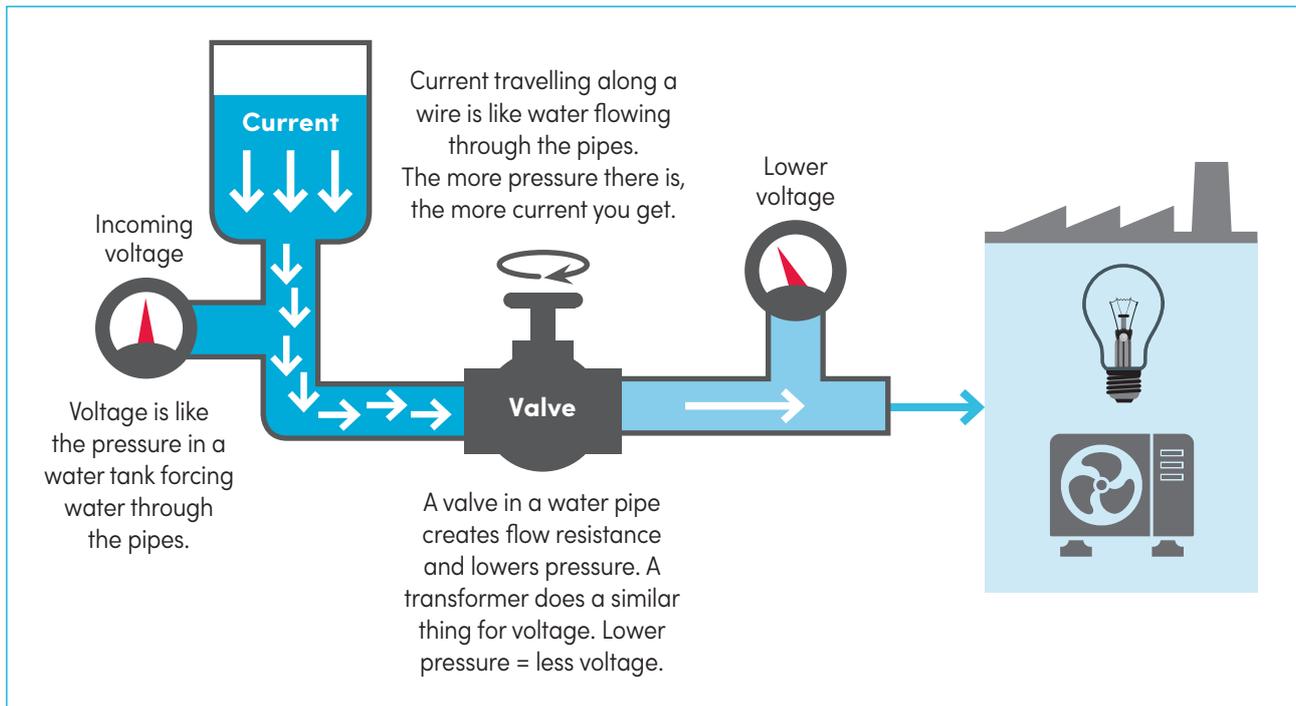
- Voltage is the difference in potential energy between two points. All electrical equipment is dependent on voltage to operate.
- A reduction in voltage can reduce the energy consumed by certain equipment, therefore reducing electricity consumption and costs.

## How is voltage supplied?

Australian standards require electricity to be supplied at 230 V (+10% to -6%), therefore providing an allowable voltage supply range between 253 V to 216 V. Voltage is generally supplied to NSW users between 250 V and 240 V.



## Basic concepts of voltage in an electrical system



## How does voltage optimisation apply to your site?

Depending on the equipment present at your site and the supply voltage levels, you may benefit from controlling, reducing or optimising your voltage.

You can determine if your site is likely to benefit from implementing voltage optimisation by performing a voltage sensitivity check.

Note that voltage optimisation works by appropriately reducing the voltage supplied to your site for individual equipment. Consequently, the electricity consumption and cost savings can only be achieved in equipment that is 'sensitive' to changes in normal supply voltage.

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### Voltage optimisation

- Voltage optimisation aims to adjust the voltage levels from a wider range (i.e. supplied between 253 V and 216 V) to a narrower range (e.g. 230 V  $\pm$  1%) that is optimal for your particular electrical equipment
- In some cases, an adjustment in supply voltage levels may lead to a reduction in electricity consumption and associated costs.

## How can voltage optimisation benefit my site?

Potential benefits of voltage optimisation include:

- equipment is supplied with the optimum voltage
- a reduction in energy consumption (and associated costs) and indirect greenhouse gas emissions
- an overall increase in the lifetime of electrical equipment
- potential reduction in maintenance frequency, effort and costs
- improvement in overall power quality (depending on the type of voltage optimisation technology implemented).

## What do I need to take into consideration?

- Voltage optimisation units may not be suitable for all sites and equipment types. Always consider both the current and future needs of your business and whether voltage optimisation is a good fit.
- Voltage optimisation may not be the most suitable energy management solution for your suite – always assess voltage optimisation against alternatives (such as equipment upgrades).

As a decision maker within your business, it's important to consider all aspects of any investment decision relative to your operations. Our **voltage optimisation guide** will help you determine whether this technology is suitable for your site.

### Voltage sensitivity checklist

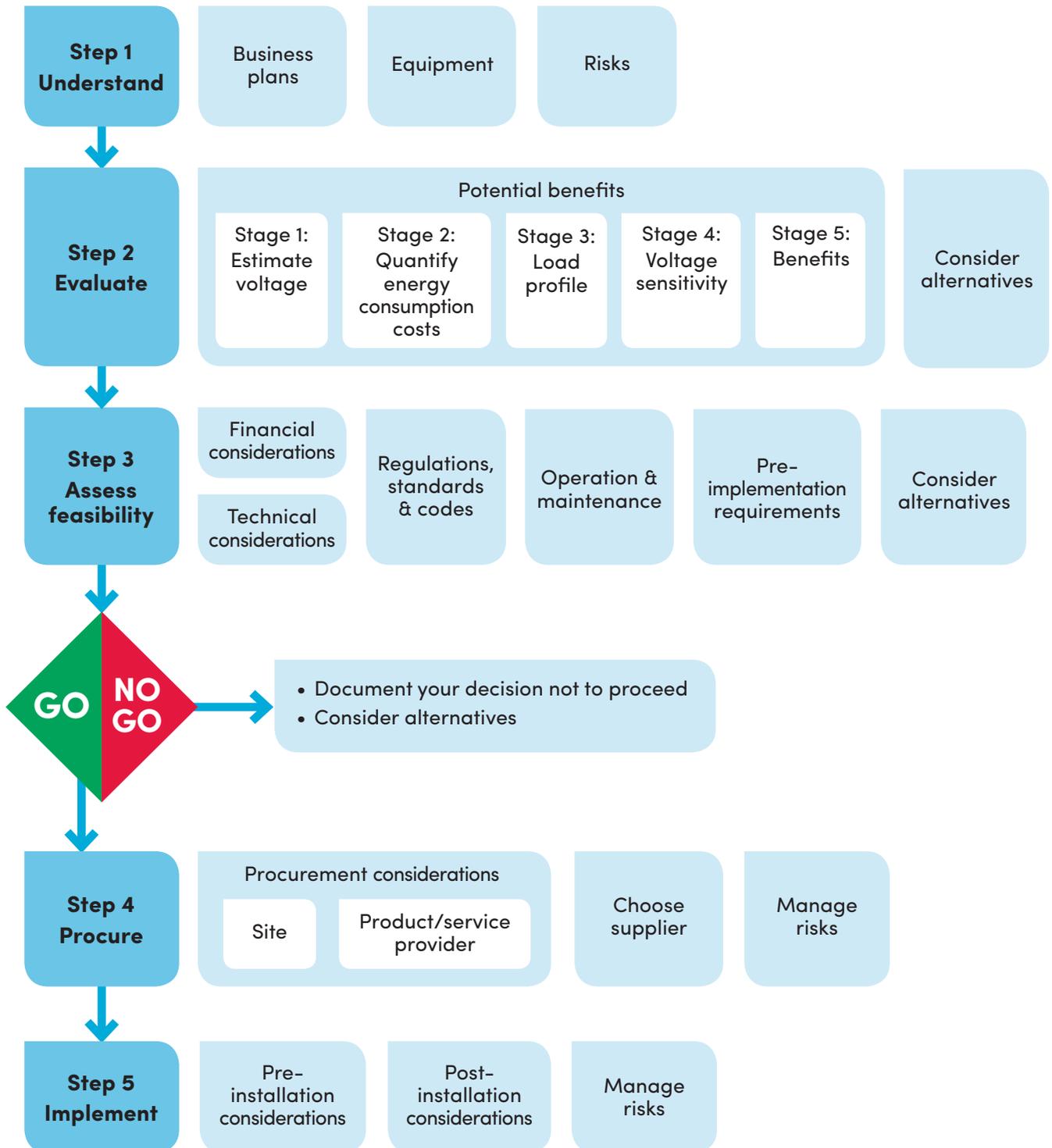
Electrical equipment can be broadly categorised as being voltage sensitive and voltage non-sensitive.

Equipment sensitivity	Explanation	Equipment type	Why this is important?
 <b>Voltage sensitive</b>	Power consumption and/or output of an appliance varies depending on the voltage supplied.	Examples include: <ul style="list-style-type: none"><li>• incandescent lamps</li><li>• mercury vapour lamps</li><li>• sodium vapour lamps</li><li>• equipment with fixed speed motors.</li></ul>	Understanding the voltage sensitivity of your equipment will determine the potential benefits of voltage optimisation.
 <b>Voltage non-sensitive</b>	An appliance is designed to have a fixed power consumption and output, regardless of the voltage supplied.	Examples include: <ul style="list-style-type: none"><li>• LEDs</li><li>• IT equipment</li><li>• surge protection equipment.</li></ul>	

For a list of common types of electrical equipment and their voltage sensitivities, refer to our **voltage optimisation guide**.

# Is voltage optimisation suitable for your site?

Following these key steps will help you to identify whether voltage optimisation is suitable for your site and support you to make an informed investment decision.



For further information check out our guide on voltage optimisation at:  
[www.environment.nsw.gov.au/business/energy-efficiency-guides.htm](http://www.environment.nsw.gov.au/business/energy-efficiency-guides.htm)