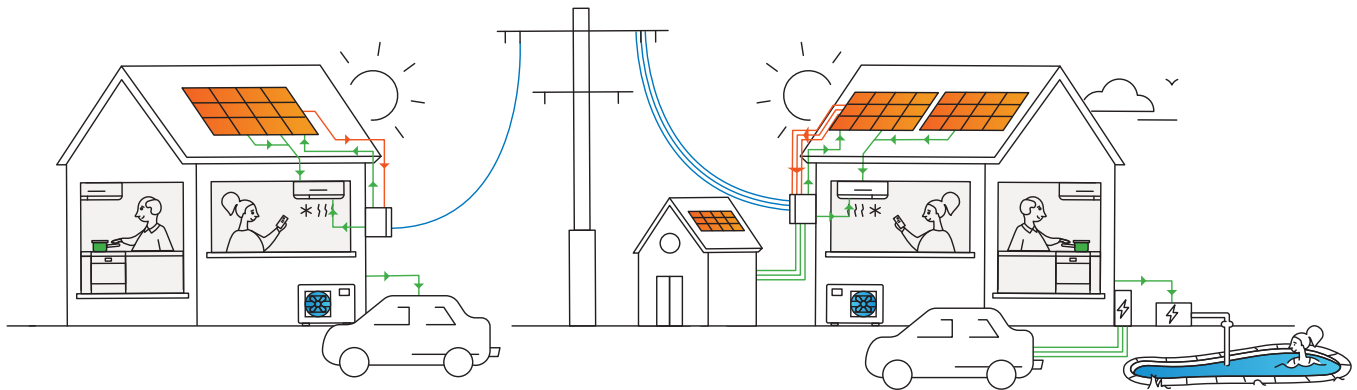


Power Up Your Home

Navigating 3-Phase Power, Switchboard and Supply Capacity Upgrades

Single phase

Three - phase



≡ 3 phase power option
— Power supply exiting from grid

— Power supply from switch board to electronics
— Power supply entering back into grid

Electrifying your home can improve its energy efficiency and save you money on your energy bills.

If you've decided to electrify, you may be wondering if you need to upgrade to 3-phase power or improve your switchboard to handle the increased load. This guide will help you determine the best course of action for your household's electrical needs.

Single-phase versus 3-phase power – what's the difference?

Most homes are connected to the electricity grid with a single-phase connection. This means there is one active wire and one neutral wire bringing electricity to your home. In a single-phase connection, all appliances get power from the one active wire.

A 3-phase connection is where the electricity can be distributed across three wires rather than a single active wire.

Do I need 3-phase power to go all-electric?

Homes don't need a 3-phase connection to switch to all-electric appliances. Most residential appliances, such as air conditioners and induction cooktops, are designed to work effectively with single-phase power.

The cost of upgrading to 3-phase power can be very high, especially for existing buildings, so you should consult with your electrician to find out how your energy goals can be met using single-phase alternatives. If you decide to upgrade to 3-phase power, your electrician can provide advice on the availability of a connection and the associated costs.

Three-phase power can be helpful and may be worthwhile for homes with very high energy demands, such as those with home workshops running heavy machinery like welders, or farms with dairies, or if you want to install a 3-phase solar PV system facilitating high exports to the grid. For those building a new home, incorporating a 3-phase connection may be more affordable during construction and could be a worthwhile investment to consider.

Working with your electrician

For any electrical work, you will need to consult a qualified electrician. If they have recommended a move to 3-phase power, a switchboard or supply connection upgrade, it is worth asking your electrician about options to meet your individual circumstances.

If your electrician recommends a supply connection upgrade (including upgrading to 3-phase), the costs to upgrade may be high. Before committing to these upgrades, ask your electrician these questions to determine if they are necessary or whether there is spare capacity in your home which can be utilised.

Here are some useful questions to ask:

- Can you help me to access my smart meter data to be sure that I require the extra capacity?
- Is it a good idea to install a home energy meter in my switchboard to get more usage data and better understand electricity use in my house? Note – this usually involves a fee.
- Can you please conduct a proper “diversity assessment” under the relevant Australian Standard to determine whether my current supply connection can handle the new demand, or whether a connection upgrade is necessary?
- What are my options to go all-electric on a single-phase connection?

Other considerations when going all-electric



Will I need to upgrade my switchboard?

There may be circumstances when your switchboard may not have enough capacity, spare slots for new circuits, circuit breakers or compliant safety features to support a combination of modern all-electric appliances, such as reverse cycle air conditioners, hot water heat pumps and induction cooktops. Upgrading or replacing the switchboard as required ensures that your electrical system can safely and efficiently manage the higher demand and future-proof your home for additional electrical upgrades.

To understand whether your switchboard can handle an increased number of electric appliances, you will need to consult a qualified electrician. The electrician will evaluate whether your home’s existing connection, and switchboard can handle any additional load, or if upgrades are required.

Some older switchboards may contain asbestos that requires safe removal by a licensed professional. A qualified electrician can identify these materials, inform you of their presence and organise for their removal. Non-compliant or unsafe switchboards (including those containing asbestos) in a home may be identified during new electrical work or any electrical compliance inspection, whether for electrification or any other purpose. Switchboard upgrades are more likely to be required in older homes (particularly where no electrical work has been completed recently).

If a qualified electrician identifies a non-compliant or potentially unsafe switchboard at your home during the electrification process, it will need to be upgraded by law to lower the risk of electrocution and fire.



Do I need a supply connection upgrade?

Typically, newer homes have a single-phase connection with a 40- or 63-amp switchboard. Most houses with a 40- or 63-amp switchboard running standard 240V appliances can successfully draw more than enough power to run all-electric appliances.

Older homes might only have a 25- or 32-amp single-phase connection and may require an upgrade to the capacity of the wire between the pole and your switchboard. If you're adding more electric appliances to your home, you will need to consult a qualified electrician to assess whether you need a connection upgrade.

If an upgrade is required, this can often be achieved through a larger capacity single phase connection, which is often substantially cheaper than upgrading to a 3-phase connection.



Will my home need to be re-wired?

Electrifying your existing gas appliances will not require your house to be re-wired. However, if a qualified electrician identifies any non-compliant or potentially unsafe wiring at your home during the electrification process, they will need to be upgraded by law to lower the risk of electrocution and fire.

Non-compliant or unsafe wiring in a home may be identified during new electrical work or any electrical compliance inspection, whether for electrification or any other purpose. Wiring upgrades are more likely to be required in older homes (particularly where no electrical work has been completed recently).

Energy Safe Victoria recommends that if your house was built more than 30 years ago, the wiring should be checked as it may not meet the latest safety requirements.

Common questions about 3-phase for particular applications:



Induction cooktops

You do not usually need 3-phase for induction cooktops. Most induction cooktops are compatible with a standard household single-phase 240V supply. However, due to their high-power draw—potentially

reaching up to 7 kW or 32 amps—they may exceed the capacity of a home's existing electrical setup when combined with other high-demand appliances. In such cases, a single-phase upgrade may be necessary, but not usually a shift to a 3-phase connection. Many homes, particularly newer ones, already have sufficient electrical capacity to handle the installation of an induction cooktop without requiring any upgrades.

A licensed electrician is usually required to install a dedicated circuit for induction cooktops.

If your electrician is recommending a 3-phase supply for the induction cooktop, you should raise the questions outlined in this factsheet before committing to this upgrade to ensure that it is required for your household. For example, by using your appliances a little smarter – you can avoid upgrading costs without sacrificing convenience.



Heat Pump Hot Water Systems

You do not need 3-phase power to install a heat pump hot water system. Heat pump hot water systems typically draw about half the current of a standard toaster and are compatible with a standard household single-phase 240V supply on a dedicated circuit.



Solar Panels

You do not need 3-phase power to install a solar panel system. Most residential solar panel systems operate as single-phase systems. However, the distribution companies usually apply an export and system size limit depending on the number of phases available.





Electric vehicles

For most electric vehicle (EV) charging needs, single-phase power is sufficient. Many portable home EV chargers are designed to plug into the standard 240-volt wall socket that you use for your kettle or your TV, and can effectively charge an electric vehicle overnight.

Some EV owners may choose to install a dedicated 7.2kW EV charger, which can charge an EV much more quickly. These chargers are faster and can still operate on a 63-amp single-phase connection. Most home chargers can be programmed to charge at set times, allowing users to charge their vehicle when other large appliances are not in use and avoiding the need for supply connection upgrades.

By using your appliances a little smarter – you can avoid hundreds or even thousands in upgrading costs without sacrificing convenience.

Higher-capacity fast chargers (22kW) are available on the market and require a 3-phase connection. However, installing these chargers is significantly more expensive. Additionally, some EVs have a capped maximum AC charge rate, making the extra investment potentially unnecessary.

If you're unsure about your specific charging needs, it's a good idea to refer to the vehicle manual to determine maximum AC charging rates and consult with a qualified electrician. It may also be useful to have a diversity assessment undertaken to determine any upgrade requirements.

Ready to go all-electric?



Head to www.energy.vic.gov.au/households/save-with-all-electric-home for everything you need to know about moving away from fossil gas in your home.

We acknowledge Victorian Traditional Owners and their Elders past and present as the original custodians of Victoria's land and waters and commit to genuinely partnering with them and Victoria's Aboriginal community to progress their aspirations.



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