Energy efficient heating appliance factsheet

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HORIZON POWER

Heating appliance factsheet

Space heating and cooling account for 40%[1] of the total energy consumed at a residential property. The typical residential natural gas heating systems are either ducted heating systems with a centralised heating unit that serve multiple rooms or a space gas heater to heat individual spaces which can be flued or unflued. Households can reduce their energy costs by electrifying these appliances using high-efficiency heat pumps which operate between 300% to 600%[2] efficiency, compared to gas heating systems operating between 61% to 90% efficiency.

Technology overview

Heap pump air conditioners, also known as reverse cycle air conditioners, are considered the most energy efficient technology for heating homes. These systems not only warm up your home but also provide cooling functions. Both functions circulate a refrigerant gas and can do so in two directions to deliver either cool or hot air.

The technology can operate between 300-600%[3] efficiency, meaning for every unit of electrical energy consumed, the system delivers 3 to 6 times more heating or cooling energy. Heat pump air conditioners offer a high energy efficiency as they utilise the properties of a refrigerant to absorb energy from the surrounding air, increase the temperature using a compressor and then blow warm air into the house. In summer, this process works in reverse by absorbing the warm air from inside the house and expelling it to the outside.

Reverse cycle air conditioner systems have three different configurations:

- **Ducted systems:** can replace an existing gas fired ducted gas system. The gas fired heating unit would be replaced with an outdoor heat pump air conditioning unit.
- **Split systems:** can replace single room space heaters. These systems have an outdoor unit and an indoor unit (the fan) which is usually mounted on an internal wall.
- **Multi-head systems:** are an option for households with multiple room space heaters. One large outdoor unit can be connected to multiple indoor units. This option can reduce installation costs and maintenance costs due to the reduced number of components.

LPG versus electric equivalent appliance

When choosing between converting a natural gas appliance to electric or LPG, consumers will often have a preference based on familiarity with an appliance type and previous user experiences, but you should also consider the energy efficiency, bill impact and operational considerations. When reviewing your options, you should also consider advancements in technology. Modern, electrically powered appliances can often deliver the same or improved user experience compared to a gas equivalent.

Table 1: Most efficient appliance quick facts

LPG appliance	Electric equivalent	Electrification benefits
LPG ducted space heater	Reverse cycle air conditioner	• **Efficiency:** operate at 300% to 600%[2] efficiency • **Flexibility:** capable of heating and cooling space with a single unit

Table 1: summarises an electrical equivalent technology and user benefits compared to a gas equivalent.

When reviewing electric appliance options, you should also consider other factors, such as energy bill savings, only having a single supply charge (not paying a supply charge for both LPG bottle and electricity connections), safety, and air quality.

Table 2: Comparative annual costs of LPG and electric appliances

LPG appliance	LPG annual costs	Electric equivalent	Electric annual costs	Potential annual energy cost savings
LPG ducted space heater	$1545	Reverse cycle air conditioner	$643	$902

*The above comparison considers a medium household of 3-4 people; higher savings are expected for larger households.

**Costs are based on the average cost of a 45kg LPG tank from local Esperance suppliers, and the average household electricity A2 tariff in Esperance as of 31st March 2022.

[1] Commonwealth of Australia Department of Industry, Science, Energy and Resources, Heating and Cooling, < www.yourhome.gov.au/energy/heating-and-cooling >

[2] Commonwealth of Australia, Heating and Cooling, < www.energy.gov.au/households/heating-and-cooling

[3] Commonwealth of Australia, Heating and Cooling, < www.energy.gov.au/households/heating-and-cooling

Installation considerations

The type of heat pump air conditioning system installed at a residential property is dependent on the home occupancy levels, room sizes and whether a ducted system already exists. The below list highlights some considerations to consider when installing a reverse cycle air conditioning unit; however, this is only an indicative list and final requirements and considerations need to be provided by a licensed electrician and gas fitter.

Some installation requirements to consider include:

- Ensure heat pump air conditioning is designed to operate in Climate Zone 5 and has a high energy efficiency star rating. For more information on air conditioners and energy rating, please visit **energyrating.gov.au/products/air-conditioners**. For information on how to read energy rating labels, please visit: **energyrating.gov.au/label**.
- When retrofitting a heat pump air conditioner into an existing ducted system, the ducts' infrastructure must be inspected to ensure that it is properly insulated and can be integrated into the new heat pump system.
- Properties considering split systems or multi-head systems should understand where the indoor and outdoor units can be installed and the implications of drilling holes in walls and running electrical cables to switchboards. A licenced electrician or gasfitter should be able to provide this information.
- Engage a licenced electrician to review your switchboard to ensure there is adequate capacity to install the new appliance and determine whether switchboard or wiring upgrades may be required.
- When removing a natural gas hot water system, a certified gasfitter will be required to make the redundant natural gas fittings safe.

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