



THE CLEANER ENERGY ALTERNATIVE

Specifying High Efficiency Gas Heating for Australian Buildings

INTRODUCTION

By entering into the Paris Climate Agreement, the Australian government committed to a global goal of zero net emissions by 2050. This represented our contribution to the international effort in tackling the global temperature rise and extreme weather effects of climate change.

According to the Climate Council, Australia is not on track to meet its emissions targets for 2030.¹ There are several contributing factors. One is the environmental impact of the building sector, which accounts for 25% of Australia's emissions.² Another factor is the continued use of emissions-intensive fossil fuels, such as coal, as the main energy sources in the production of electricity.³

Natural gas and LPG (liquefied petroleum gas) are often lumped in with other fossil fuels and considered unclean, inefficient and unsafe. However, these are common misconceptions. Through careful and informed design and specification, high efficiency gas products can be a key component of environmentally-friendly, energy-saving Australian buildings.

In this whitepaper, we dispel some myths about the environmental impact and safety of natural gas and LPG. Against this backdrop, we provide useful guidance on specifying energy-efficient heating solutions for Australian homes.





DISPELLING MYTHS ABOUT GAS

WHAT IS THE ENVIRONMENTAL IMPACT OF GAS?

Natural gas and LPG are among the mainstays of global energy alongside coal and oil. The energy sector, which is highly dependent on these fuels as energy sources, makes up approximately 70% of Australia's net greenhouse gas (GHG) emissions.⁴

On closer inspection, gas is much less emission-intensive than coal and oil. For example, natural gas emits 50-60% less carbon dioxide (CO₂) when combusted in an efficient natural gas power plant when compared against the emissions from a typical new coal plant.⁵

Most of the gas and coal produced today is used for power generation and as a source of heat for buildings. According to the World Energy Outlook, an estimated 98% of gas consumed today has a lower lifecycle emissions intensity than coal when used for power or heat.⁶ Furthermore, when switching from coal to gas, emissions are reduced by 33% when providing heat and 50% when generating energy.⁷

Additionally, the gas industry has implemented improvements along the gas supply chain to minimise overall lifecycle emissions. This includes introducing technology to reduce leakage of methane, which is the primary component of natural gas and is a powerful greenhouse gas in its own right. Across the home appliance industry, gas energy ratings are commonly used to indicate the efficiency of gas-powered appliances enabling consumers to reduce their own environmental footprint.

Natural gas and LPG are also much cleaner-burning sources of energy and heating than other fossil fuels. During combustion, natural gas produces negligible levels of sulfur, mercury and particulates.⁸ When producing an equal amount of energy, gas generates less pollutants and CO₂ than coal and petroleum.⁹

According to a 2010 American study, using natural gas instead of coal in a typical home avoids the annual emissions of 1,900 tons of nitrous oxide, 3,900 tons of sulfur dioxide, and 5,200 tons of particulates.¹⁰

IS GAS SAFE?

As the cleanest burning fossil fuel, the reduced amounts of pollutants emitted by natural gas (in comparison to coal and oil) has benefits to public health. Such pollutants have been linked with health problems such as asthma, bronchitis, lung cancer, and heart disease.

Natural gas and LPG are also non-toxic and non-poisonous. However, prolonged exposure can cause nausea, dizziness, and possibly asphyxiation. To mitigate this, a chemical called mercaptan is added to give gas a distinctive odour, helping occupants quickly recognise if there is a gas leak.

While generally safe, fuel gases are highly flammable, so precautions need to be taken. It is advisable to follow any safety requirements and instructions (including warning labels and signage) issued by the manufacturer when transporting, storing or using gas. Design and construction professionals, as well as consumers, should further consult the gas supplier, a licensed gasfitter or the gas appliance manufacturer if needed.

Natural gas has been widely used for generations and makes up more than 20% of the world's energy production, so practices for the safe handling and use of gas are well known. Modern appliances using natural gas have features to ensure the safe, clean and efficient use of the product such as flame failure devices, which cut off gas if the flame is accidentally extinguished, and automatic reignition, which enables the appliance to relight itself in the same situation.¹¹ Gas heater and flue installations are also highly regulated and subject to strict safety requirements and specifications.

SPECIFYING FOR HIGH EFFICIENCY HEATING

BACKGROUND

Heating and cooling is the largest energy user in the average Australian home, accounting for 40% of household energy use.¹² Gas heaters produce approximately a third of the greenhouse gas emissions of standard electric heaters when creating a similar amount of energy.¹³ For the environmentally-conscious, gas heating is a smart design choice.

However, there are still a number of natural gas or LPG-powered products manufactured around the world that are considered inefficient. Such products may look great aesthetically, but based on the amount of energy combusted, their heat output is minimal. Decorative gas appliances are becoming less popular because of this fact.

Informed specification can help you select products that deliver high efficiency heating without compromising on quality, performance or style.

CHOOSING EFFICIENT GAS PRODUCTS

Energy ratings

In accordance with *AS 4553:2008 Gas space heating appliances* and *AS 4556:2011 Indirect gas-fired ducted air heaters*, gas heaters sold in Australia are required to feature gas energy labels that indicate their comparative energy consumption.¹⁴ Under these labelling schemes, both natural gas and LPG heaters must be tested and certified by independent testing organisations.

The energy star rating that appears on gas heaters is based on net heater efficiency. It represents the amount of raw energy input consumed by the heater versus the heat energy output provided. Note that heat output is measured by kilowatt (kW) whereas gas consumption is often expressed in megajoules (MJ). The more stars on the label, the more efficient the heater.¹⁵

Only choose gas heaters with the best energy ratings indicating high performance and efficiency. When selecting a heater, it is prudent to request evidence of testing and certification from the manufacturer.

Building and site conditions

The efficiency of a gas heater is affected by environmental factors including:

- installation location;
- usage;
- climate;
- ambient air and water temperature;
- humidity; and
- insulation.

Physical features of a room, including carpets and curtains, need to be accounted for when assessing kW output. It will require more kW output to heat areas that do not have insulation, carpets, and other elements that assist with thermal performance.

Intended heating area and climate zone

The size of the gas heater is a key consideration when selecting the appropriate heating solution for an indoor space. A gas heater that is too small will not heat the intended space adequately. Conversely, a heater that is too large will be inefficient.

The required kW output required from the gas heater will depend on the area that is to be heated, as well as the climate zone. Below is a rough guide to climate zones and the required heat output:¹⁶

- Very Cold Zone: 1kW output required for each 8.5m².
- Cold Zone: 1 kW output required for each 10m².
- Cool Zone: 1kW output required for each 13 m².
- Mild Zone: 1kW output required for each 16m².

As a practical example, a 7.3kW output heater in a Cold Zone will heat approximately 73m². Leading manufacturers can provide guidance as to the size of the heater for the intended application.

REAL FLAME

Part of the Glen Dimplex Group, Real Flame are committed to designing and building fireplaces that create a focal point for family and friends to share life's special moments around. From penthouse suites and high rise apartments, to town houses and suburban homes, there's a Real Flame fireplace to make each one the perfect place to relax.

Real Flame focuses on serving the Australian consumer. The company designs, develops, and manufactures gas fireplaces at their Melbourne headquarters, while also leveraging a global network to provide wood burning and electric flame products.

HIGH EFFICIENCY GAS FIRES

Inspire

The new Inspire gas log fire range brings warmth and comfort to your room. With all the typical features of a gas log fire, it delivers a stunning flame pattern in three different size options.

The versatile power flue technology enables installations in variety of applications and also includes driftwood and coal media, the pebble media available for natural gas models only.

- Three size options: 700, 900 and 1100
- Double-glazed space heater
- Natural gas and LPG option
- Power-balanced flue
- Full remote control function
- Up to 4.6 star efficiency

Element

The Element range is simply breathtaking with its clean lines, beautiful flame pattern and multiple media options. With an impressive star rating, WiFi capability and the latest in power balanced flue technology it makes it the perfect package for the discerning buyer.

- Power-balanced flue
- Natural gas, LPG or ULPG
- Control via remote control or WiFi app
- Double-glazed space heater
- Up to 4.6 star efficiency

Vektor 1100

With an advanced in-log burner that creates an incredible campfire flame pattern, the Vektor 1100 has a massive 10.6kW output, allowing the fire to heat up to 150 m². The power flue technology provides safe room sealed operation which means there is no need for additional ventilation.

- Two internal finishes to match all décor types: ribbed ceramic or glass
- ROBAX® Magic Black
- Modern edge-to-edge outer glass
- Control via remote control or WiFi app
- Power-balanced flue up to 13.5m horizontally or vertically
- Natural gas only
- 3.8 star efficiency

Accent 800

The Accent™ delivers all the features you would expect from a gas log fire, with a stunning flame pattern within a compact fire that will fit into the average-sized living room with ease. New power flue technology enables versatile installations and also includes full remote control.

- Power-balanced flue
- Natural gas and LPG approved
- Full remote control function
- Double-glazed space heater
- Up to 4.5 star efficiency



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All information provided correct as of November 2020