A GUIDE TO

CHOOSING THE RIGHT HEATING SOLUTION

The floor to ceiling climate control specialists

HPAC ENERGY CENTRE

CHOOSING THE RIGHT HEATING SOLUTION

When searching for the right heating solution for your home you want to find that sweet spot between having a warm, cosy home and a manageable power bill.

World Health Organisation guidelines recommend a minimum temperature of 18°C in houses, or higher for more vulnerable groups like children, the elderly and people who are unwell. But during winter, let's be honest, we also like our homes to be a bit warmer.

As a general guide: for moderate climates such as New Zealand, a well-insulated room of 20 square metres will probably need a 2,000W heater powered by electricity or a gas option with 6 to 8MJ input.

This guide covers the most common forms of home heating available today and discusses the pros and cons of each to help you make the right choice.

INSULATION

The right heating solution and its effectiveness is dependent on the size of the area you want to heat and also its ability to retain heat. For that reason, the very first part of choosing the right heating solution is to ensure you have good quality insulation. It will make your house easier and cheaper to heat properly, and more comfortable and healthy to live in. Go for ceiling and underfloor insulation as a priority, followed by walls.

HEAT PUMPS

Heat pumps are among the most energy-efficient forms of heating appliance available.

Today's heat pumps are incredibly versatile, with lots of advanced features that allow you to customise the way your unit operates to enhance efficiency and complement your lifestyle.

They work by taking heat from the air outside and using it to warm the air inside. They can do this even when it's very cold outside although this does mean they work harder and can be less efficient

Benefits

- VERY effective in terms of the power they use compared to the heat they generate
- Good for room-specific heating
- Good for larger spaces such as open-plan living areas
- Highly controllable with a thermostat setting and timer
- Heat pumps also incorporate air filters that remove dust and pollen

COST TO RUN

5-10 cents/kWh

Things to consider

- More expensive to buy than a small electric or gas heater
- Blasting the heat will make you nice and warm but will raise power bills
- Can be used for cooling in summer but are not necessarily the most energy-efficient option for this
- Must be installed by a qualified technician
- Require servicing to keep them tip top
- For every kWh of electricity they use they will produce 4.5kWh of heat
- Less efficient when outside temperatures drop below 7°C and may need to stop and de-ice in very cold conditions.
- Can be noisy (both indoor and outdoor units)
- Won't work in a power cut

THE DIFFERENT TYPES OF HEAT PUMP

Single split heat pumps

A single split heat pump has one indoor unit and one outdoor unit. This is the most common kind of heat pump you find in New Zealand homes.

Benefits

- The option of buying the most efficient models for each brand
- If there are any issues with the outdoor unit only the one indoor unit is affected

Things to consider

- If you are looking to heat three or more rooms they are more expensive on a per unit basis than a multi zone
- If you have more than one single split heat pump you'll also have more than one outdoor unit attached to your home

Multi split heat pumps

Multi split heat pumps have one outdoor unit but more than one indoor unit connected to it. They are gaining in popularity thanks to their ability to heat and cool a wide range of rooms. Multi-split units have the added advantage of enabling you to create different temperatures in different rooms, giving you greater control over your environment.

Benefits

- It can be more cost efficient when buying more than two single split units
- Because there's only one outdoor unit on the side of your home it's more aesthetically pleasing

Things to consider

- Having only one outdoor unit means that if there's an issue with it, all of your indoor units are affected
- The indoor units available for multi-split systems whilst varied in type, may be limited in features when compared to comparable single-split models
- Many of the major brands' most efficient models only come as single-split heat pumps

Ducted systems

Also known as 'central heating', ducted systems disperse air through discreet vents mounted in the ceiling. They usually consist of the indoor vents, outdoor unit and flexible ducting which is hidden in the roof cavity.

Benefits

- They're virtually invisible; all you ever see are subtle grills in the ceiling and the control pad on the wall
- You can have some control in individual zones of your home, enjoying a consistent total temperature around your whole home from one central system

Things to consider

- Unlike single or multi split heat pumps, which you strategically place where you need heating, ducted systems service the whole house. Therefore, they are the most expensive option to install

Types of indoor heat pump units

High wall unit

Placed high up on a wall, these are the most popular and economical to buy and suitable for almost every home. They're simple to install and don't take up any floor space.

Floor console

As the name suggests, floor consoles are mounted on the wall just above the floor. They are good for homes with high ceilings as they spread heat from low in the room. They're great if you're replacing a night store or fixed gas heater as they cover the space left behind without having to redecorate.

They're easy to install and maintain but can be slightly more expensive than a high wall heat pump even though they operate in a very similar way.

Ceiling cassette

Recessed into the ceiling, this is an elegant solution that looks good. You're able to direct heat/air to any part of the room, as opposed to a high wall or floor console which can only emit heat outwards from its location. And come summertime, being located at the top of the room where warm air gathers, ceiling cassettes are very good for cooling.

Although not currently common in residential homes, it's definitely worth considering if you want a compact, unobtrusive solution that leaves all your wall and floor space available.

All three of these options can be single split or part of a multi split system.

What's right for your home?

If the area you want to heat is a large living area, go for a single split unit. However, if you have a main living area and a couple of smaller areas to heat, a multi-split is ideal. If you're building new it's worth including in your budget a ducted system as this will last many years. Ducted systems can also be retro-fitted to existing homes too.

However, the right heat pump really depends on the size and shape of the space you want to heat and how you want it to operate. The heat pump you choose needs to be powerful enough or it won't be as energy efficient as it could be, sending those power bills up. On the flip side, if it's too big and powerful it will be noisy, draughty, will increase your power bills and be unlikely to heat the room evenly.

ELECTRIC HEATERS

Electric heaters sit at the cheaper to mid-range end of the scale to buy, but the more expensive end to run. They are generally portable so can be moved to where you need them and stored easily when not in use. They're a good option for small spaces or rooms you're not going to be in for long.

COST TO RUN
About 26 cents/kWh

Radiant heaters

These radiate heat from a red-hot heating element.

Benefits

- Lovely and warm and the heat is virtually instant
- Relatively inexpensive to buy
- Floor and wall-mounted models available
- Portable versions can be moved from room to room as needed

Things to consider

- Don't really heat the air in a room very well
- Exposed heating element can be a fire and safety hazard
- Not safe to leave unattended

Column heaters

These use electricity to heat oil (or some other material) sealed inside; heat is transferred to the casing and therefore the air circulating the columns.

Benefits

- Useful in rooms where they'll be switched on for long periods of time
- Can be left unattended (e.g. overnight in a bedroom)
- The surfaces don't get as hot as other types of electric heaters

Things to consider

- Take longer to heat a room than fan or element heaters

TIP Use a ceiling fan on very low speed to help the heat from your column heater distribute faster and more evenly.

Convection and panel heaters

These work by drawing cold air over an electric heating element; the warm air rises and is replaced with cooler air and the cycle repeats until the room is warm. They often have a fan to aid the convection effect forcing the warm air up and away.

Panel heaters are a type of convection heater that are thin and flat and are great for mounting on a wall, out of the way.

Benefits

- Heats air in a room evenly and quickly (use a ceiling fan on low to help circulate the warm air even better)
- Lightweight and can be portable if not wall mounted

Things to consider

- Using a model with no fan, the air doesn't circulate as well and is more likely to form layers of different temperatures; could leave you with cold feet
- Can be comparatively expensive to buy

Fan heaters

Fan heaters blow hot air into the room. They are generally smaller and more portable than other electric heaters.

Benefits

- Perfect for small rooms
- Heat from the heater is instant but it can take a little while to heat a whole room
- Can heat the air in a room more rapidly evenly and quickly

Things to consider

- Try to avoid leaving them unattended as they are a potential fire risk
- Can be quite noisy
- Once turned off the heat disappears really quickly

GAS HEATERS

Gas heaters can be portable or built in with a flue. They are good for heating smaller to medium-sized spaces.

Whilst they can be good value to run, they come with a warning. Burning gas produces waste products, e.g. carbon monoxide (which can be extremely dangerous, even lethal) and water vapour (which can lead to condensation and mould). Flued heaters direct their fumes outside through a flue or pipe, whereas un-flued portable gas heaters expel the fumes and water vapour into the room.

COST TO RUN

Around 15-16 cents/kWh for natural gas heaters, 19-26 cents/kWh for LPG

Un-flued gas heater

Benefits

- Portable – move them from room to room as needed, and you can point them in different directions, store it over summer
- Provide instant heat – and lots of it (un-flued gas heaters have the capacity of up to 25 MJ/h, the equivalent to more than 6kW of electric heating, that's three 2kW electric heaters!)
- Great for when there's a power cut

Things to consider

- More expensive to buy than electric heater of a similar size and purpose
- Won't work if you run out of gas
- Not having a flue means that emissions from the gas combustion process in the heater are vented back into your room
- Safety issues – need to keep the room ventilated
- May also need to buy a dehumidifier to deal with water vapour/condensation
- Can be problematic for those with asthma, certain allergies or respiratory problems (flued gas heater would be better in these circumstances)

Flued gas heater

Benefits

- Electronic ignition offers potential energy savings as you don't have to have a pilot light running all the time
- Remote controls allow you to control the temperature settings and fan speeds
- Thermostat allows you to set the temperature you want
- Programmable timers to help save on energy
- Safer option as it removes the risk of carbon monoxide poisoning

Things to consider

- Needs professional installation so factor that into your budget
- These are more expensive to buy and install
- Need access to a natural gas line through an energy company or sign up for a gas bottle service
- Won't work if you run out of gas

Gas fireplace

Benefits

- Very elegant solutions
- Can be built into the wall so they don't take up any room
- Offer the aesthetic of a wood burner without the mess
- Many modern gas fireplaces have 5 star efficiency ratings, so they cost less to run than older models
- Easy to start with the push of a button
- Heat a room quickly
- Some models have add-on vented heat transfer systems to heat additional rooms, acting like central heating
- Can have modern features like remote control via smartphone app

Things to consider

- Needs professional installation so factor that into your budget
- Quite expensive to buy and install
- Need access to a natural gas line through an energy company or sign up for a gas bottle service
- Won't work if you run out of gas

WOOD BURNERS

The classic heating options for a cosy look and feel, there are not many people who don't love a good old fashioned wood burning fire.

COST TO RUN

14-20 cents/kWh

When you have to buy firewood but you get a lot of heat for your money

Benefits

- Can be very cheap or even free to run depending on your access to firewood
- Very powerful heater, about 8kW (best used with a heat transfer system to spread it throughout the home)
- Works in a power cut
- Can also be used for cooking
- Near-carbon neutral as they use renewable fuel
- Can be combined with a wetback to provide hot water heating

Things to consider

- Time consuming to start
- Heat is not instant
- No way to cool it down if you get too hot
- Have to buy and or/chop wood
- Potential fire and safety risks
- Messy – the wood can leave chips and barks on the floor, afterwards you have to deal with the ashes
- You need somewhere to store wood (and there's got to be lots of it)
- Not actually very energy-efficient compared to modern heaters and heat pumps
- Produce combustion gases and smoke so they need a flue or chimney, which makes installation expensive
- Need maintenance, e.g. chimney clean every season
- Smoke from wood fires can be a major contributor to pollution
- Heavily regulated by local councils, requires consent

Pellet fires

These are small burners that are fueled by pellets made of compressed organic matter such as sawdust.

COST TO RUN

8-16 cents/kWh

Benefits

- Small bags of pellets are easy to store and they last a while
- Incredibly energy-efficient
- Don't need to build a fire to start it as it has an ignition button
- Fire is contained in a heat box inside the unit so there's not much smoke
- Pellets burn hotter and cleaner than logs of wood, creating considerably less ash than firewood
- Considered to be carbon neutral because the pellets are recycling waste

Things to consider

- Can be expensive to buy
- Need proper installation
- Won't start if the power goes out

UNDERFLOOR HEATING

This can be embedded in a concrete slab when you build a new home or installed under the flooring of a new or existing home.

Underfloor heating can consist of electric cables or water-filled pipes (hydronic system) which can be heated by electricity, gas, heat pump or solar.

It's a good investment if there's someone home most of the time however, they do use a lot of energy to get the floor up to the right temp (especially concrete) but once it's heated, it acts as a low temperature radiator.

Underfloor heating is reasonably maintenance free but if they do need repairs it can be expensive as you may need to rip up the floor to get to it.

COST TO RUN

Varies depending on heating source

Benefits

- Can be heated a number of ways – electricity, gas, heat pump or solar
- Controllable with thermostat and timer settings (some with room-by-room control)
- Delightful underfoot feeling

Things to consider

- Floor needs to be well insulated or you will lose a lot of the heat to the outside and into the ground below
- Does not heat a room quickly
- Needs to be left on all the time to be most effective
- Needs very good under-floor insulation
- Often difficult to retrofit to existing homes without substantial renovation
- Solar hydronic systems need back up heating when the sun doesn't shine
- Can be expensive to run depending on the source of the heat

CENTRAL HEATING

As the name suggests, heat is generated at a central point and piped or ducted to multiple rooms. It is commonly fueled by gas, diesel or a heat pump but can also use oil, coal, wood, wood pellets or solar. Heat can be transferred using warm air through vents or hot water can be piped to radiators.

COST TO RUN

Varies depending on the fuel used

Benefits

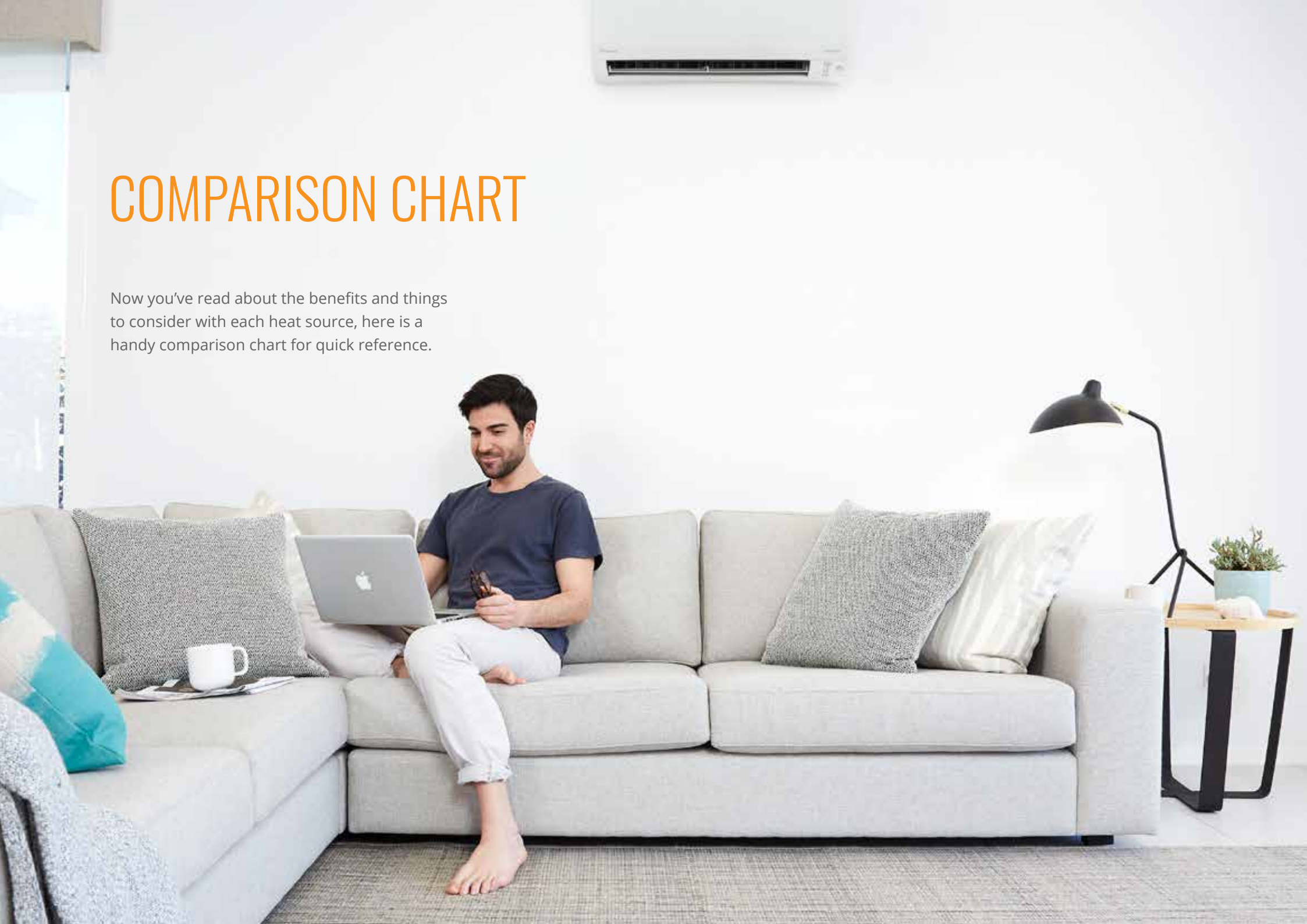
- Some systems use combination boilers which heat the hot water for the taps as well
- Offers a high level of control
- Can heat the entire home to an even temperature
- Can be timed to come on and temperature set using a thermostat

Things to consider

- Can be difficult to retrofit without major renovations
- Ducted systems can lose heat through ducts under the floor or in the ceiling
- Radiators take up floor and wall space
- Make sure you can control the heat to each room independently so you don't waste energy heating unused rooms

COMPARISON CHART

Now you've read about the benefits and things to consider with each heat source, here is a handy comparison chart for quick reference.



Type Of Heating Solution	Features And Benefits											
	Looks Good	Quiet	Energy Efficient	Cheap to Buy	Cheap to Run	Heats Whole Home	Good for Small Spaces	Portable	Built In or Fixed	Works in Large Open Space	Can Be Left Unattended	Powerful and Warm
Single Split Heat Pump	•	•	✓		✓ •		✓		✓	✓	✓	✓
Multi Split Heat Pump	•	•	✓		✓ •	•	✓		✓	✓	✓	✓
Ducted Heat Pump	✓	•	✓		✓ •	✓	✓		✓	✓	✓	✓
Radiant Heater		✓		✓			✓	•	•			•
Column Heater		✓	•	✓	✓ •		✓	✓			✓	
Fan Heater				✓			✓	✓				
Convection and Panel Heaters	•	•	•	•	✓ •		✓	•	•		✓	
Unflued Gas Heater		•	•	•	✓ •		✓	✓				•
Flued Gas Heater		✓	•		✓ •		✓		✓		✓	✓
Gas Fireplace	✓	✓	•		✓ •				✓	✓	✓	✓
Wood Burner	✓	•	•		•				✓	✓	•	✓
Pellet Fire	•	•	✓		✓				•	•	•	✓
Underfloor Heating	✓	✓	•				✓		✓	✓	✓	
Central Heating	✓	•	•		•	✓	✓		✓	✓	✓	•

Key ✓ Good option • Depends on the model and/or power source

CONCLUSION

The right heating solution will be partly personal preference and we hope the information in this guide has been helpful in solidifying what that might be for you. But also, it will depend on the size of your home, how often you use each room and the type of heat each room needs.

Each home is different, which is why **we come to your place** to properly assess what your best options are.

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