

Enjoy the heat, not the smoke!

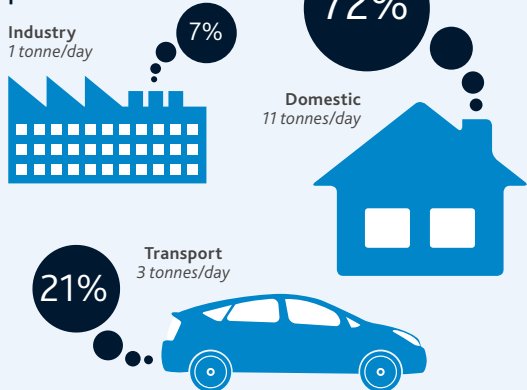
How to operate woodburners
and domestic fires to minimise
air pollution and maximise heat
and energy efficiency



Many households burn wood as a source of heat and ambience. However domestic home fires are also the main cause of air pollution in Auckland during the winter months when wood smoke creates fine particles in the air – an average of 11 tonnes a day.

An inefficiently run woodburner or domestic fire produces even more of this hazardous smoke as well as a tarry residue which has a bad effect on health. They do not heat your home properly – in fact open fires will actually draw heat from your home and create draughts. They are also very inefficient. The most energy efficient and clean home heating method is a heat pump as it does not create smoke or produce harmful fine particles. More information on heating choices is at the end of this guide.

Auckland winter fine particle sources



15 tonnes of fine particles from all sources are emitted on a winter day in Auckland. 11 tonnes are emitted from domestic fires, compared to 0.2 tonnes on a summer day.

Air pollution concentrations peak due to domestic wood fire emissions in winter time. In summer this is mainly from backyard burning.

(Source: State of the Auckland Region Air Quality Report Card, Auckland Council December 2011)

Domestic fires need to be operated without causing smoke, fly ash or odour. Causing nuisance to your neighbours is NOT allowed.

Auckland Council recognises the right of its residents to exercise choice in their heating methods so this guide offers plenty of information on how to safely enjoy your domestic fire, get the best heat out of your firewood and decrease the smoke. By working together to minimise smoke we can meet local and national targets and enjoy clean air.

Basic steps to lighting a domestic fire

Make sure you:

- stack wood loosely in the firebox so air can circulate
- use enough kindling
- never use wet or green wood
- never use treated timber
- don't put too much firewood in at first.

Once alight, make sure you:

- keep the fire burning brightly
- keep the air control open for at least 30 minutes
- burn smaller logs rather than trying to burn a single, large log
- when you add logs, open up the air control to high for at least 20-30 minutes before turning down
- be careful not to block air supply to the base of the fire with a badly positioned log
- don't damp down the fire
- don't burn rubbish in the fire.

How smoky is your chimney?

In a well maintained domestic fire that is being operated correctly, visible smoke from the chimney will reduce to a heat haze or faint smoke within about 10 minutes of lighting or putting wood on the fire.

An efficient fire will have bright swirling flames and red glowing embers with little or no smoke coming from the chimney. It may take some practice to get the cleanest burn from your chimney.

Check your chimney

Use this handy chimney checker to see how well you are operating your domestic fire. When you have got your fire going, brave the cold and go outside and look at the smoke coming from your chimney.

- If the smoke looks like the picture on the right – congratulations! – you are operating your fire well.
- If it looks like the two pictures on the left, your domestic fire is producing extra smoke that is making our air quality worse – affecting our health and wellbeing.
- Have another look at this brochure to see the simple things you can do to enjoy the heat, not the smoke.



Photo credit: Western Australia, Department of Environment and Conservation

How to burn smarter

Here are some tips on keeping your domestic fire burning efficiently so you get the best value from your firewood and really cut down the smoke.

- Only burn dry, well-seasoned wood that has been split properly. Green wood is a major culprit in the creation of smoke that pollutes the air and tarry residue that clogs your chimney. The moisture content of wood should be less than 25 per cent. It's easy to tell which is which. Dry wood has large cracks in the end of the log while wet wood is heavy and makes a dull thud when two pieces are hit together.
- Don't use wood that has been rained on or is damp. If it got wet in the rain, take small amounts inside to dry out before putting it on the fire.
- Only start the fire with paper, dry kindling or an approved commercially available fire lighter. Never use accelerants such as petrol. They are flammable and

can be extremely dangerous. A fire can get out of hand quickly if it is started with fuels other than wood.

- Burn fires bright and hot. A smouldering fire creates more smoke and less heat.
- Regularly remove ashes from the burner or fireplace. Store them outside in a covered metal container, letting them go cold in a safe area away from the side of the house to avoid creating a fire hazard.
- If the glass front on your woodburner is coated with 'gunk', it means you are not burning your fire hot enough.
- If your woodburner is smoking excessively, get it checked. Make sure you know about your own model of burner and how it operates. Check the 'troubleshooting' tips in the manual or ask a domestic fire supplier if you are not sure.
- After starting the fire leave the air controls open for at least 30 minutes. This helps build up a good high temperature, which makes the wood burn well. Do this again when you add more wood. Extended periods of smoky emissions occur if you turn down the air supply and reduce the amount of air getting into the fire box.
- Don't bank up the fire overnight. Keep a supply of kindling handy to re-start the fire in the morning. Overnight burning does not add significant warmth to a well insulated home, but greatly increases polluting emissions.
- Don't put a full load of wood into a domestic fire when there are only a few glowing embers as it causes excessive smoke for long periods – build it up again first.
- Don't burn treated or painted timber, particle board, chipboard, hardwood and fibreboard or plywood. Also, don't burn rubber products, waste oils, plastic, disposable nappies and electrical cables. These materials are prohibited because they produce harmful chemicals when burnt.
- Don't burn domestic rubbish, glossy paper or magazines and wrappers in your domestic fire. They produce harmful chemicals and tarry residue and cause offensive or objectionable smoke.

Collecting and storing firewood

The quality of your firewood is a major factor in how well your domestic fire operates, so the way you store it is vital!

Think ahead! Get your wood supply in the summer. Freshly cut wood needs to be stored for 8-12 months to allow it to season properly for good burning. Stack it loosely off the ground in a criss-cross pattern to let dry air circulate around it.

For best results, store seasoned wood in a dry place with the top covered.

Logs dry faster when split, so split wood into pieces about 10cm thick before you store it away. These are also the best size to use in your domestic fire, especially woodburners.

Woodburner size and installation

Most woodburners perform best when at or close to their maximum output. If you often run your burner at low settings (damped down), your burner may be oversized. For example, a room 6m x 4m by 3m high will need a 3.6kW heater.

If you are buying a new woodburner, or replacing one, it is important to ensure it meets emission standards and that it is the right size for the rooms that are being heated. To be installed safely and correctly, it also requires a building permit. The chimney/flue is an important component of the woodburner installation and needs to be long enough to draw sufficient air for proper combustion of the fuel.

Check with Auckland Council or a domestic fire retailer if you think your burner may not be correctly installed.

If you are building a new house or undertaking major renovations, a woodburner will perform better when located towards the centre of the house and not against an outside wall.

For help and information on home heating, contact the New Zealand Home Heating Association Inc on 09 442 4261 or visit their website nzhha.co.nz

Look after your woodburner

Keep your woodburner well maintained and serviced – make sure the chimney/flue is cleaned every year. This helps your fire burn more efficiently. Make sure you replace broken fire bricks and keep the burner in good repair. Make sure the flue is insulated and is high enough to let smoke and gases disperse and avoid fire risk from the build up of tarry residue.

DIY repairs to woodburners are NOT recommended as this may also cause smoke or safety problems.

If the woodburner becomes difficult to start or smoke puffs out when the door is opened then the flue is probably clogged with tarry residue. It is recommended you contact a professional chimney cleaner to clear the flue.

If your current burner is more than 10 years old it may need replacing so think about other cleaner forms of heating. Upgrade to an alternative that discharges low, or no, levels of pollutants. Alternatives include authorised woodburners, heat pumps, flued gas or pellet fires. Unflued gas heaters are NOT recommended because they make your house damp and release harmful chemicals inside your home.

Insulation and other options

Without insulation you will lose 30-35 per cent of heat through the ceiling, 18-25 per cent through the walls, 21-31 per cent through the windows and 12-14 per cent through the floor. Remember that the floor is the coldest part of a room. Children are closer to the floor and can spend a lot of time playing on the floor. Under floor insulation will also help stop moisture moving up into the house.

If you get the design and insulation right for your house you won't need as much heating and can consider installing a smaller, more efficient heating system. Good insulation and design also makes other forms of heating very cost effective too. If your house was built before 2000, you are eligible for up to \$5,000 financial assistance from Auckland Council to get your home retro-fitted to high energy efficiency and health standards. Email retrofit@aucklandcouncil.govt.nz for more information.

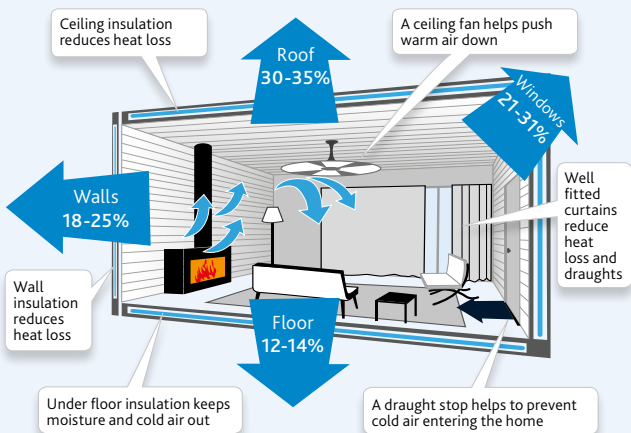
You can also apply for ENERGYWISE™ funding to install insulation. For more information see the Energy Efficiency and Conservation Authority website energywise.govt.nz, email info@eeca.govt.nz or call 0800 749 782.

The efficiency of home heating methods will vary:

Open fires are only about 15 per cent efficient. A modern, efficient and NES compliant woodburner is 65 to 75 per cent efficient. Flued gas and pellet fires are about 75 per cent efficient. However, a heat pump provides 3-4 times as much heat for your living spaces for every unit of electricity it uses to run.

When building or renovating, consider the options for including passive solar design, solar water heating and solar electric (photovoltaic) systems in your home to improve energy efficiency and make immediate and long term savings!

Sources of heat loss in an average uninsulated house



Source: smarterhomes.org.nz/design/insulation

Find out more: phone 09 301 0101
or visit aucklandcouncil.govt.nz