



DOMESTIC SOLID FUEL/WOOD FIRE HEATER
POLICY NO: DE 06

Our Vision

Nambucca Valley ~ Living at its best

Our Mission Statement

'The Nambucca Valley will value and protect its natural environment, maintain its assets and infrastructure and develop opportunities for its people.'

1.0 Policy objective

To improve air quality, community health, community life expectancy, amenity and sustainable use of natural resources by reducing air particulate matter from solid fuel/wood fire heaters in Nambucca Shire by way of heater selection, correct operation, increased efficiency and effective use and storage of wood.

2.0 Related legislation

- *Environmental Planning and Assessment Act 1979*
- *Local Government Act 1993*
- *Local Government (General) Regulation 2005*
- *Protection of the Environment Operations Act 1997*
- *Protection of the Environment Operations (Clean Air) Regulation 2010*

3.0 Definitions

Air pollution means the emission into the air of any air impurity.

Creosote is the black oily accretion that builds up inside of chimney flues as a result of incomplete burning of wood or coal

Particulate Matter are tiny subdivisions of solid or liquid matter suspended in a gas and can be referred to as air pollution.

Solid Fuel is solid material such as wood, charcoal, peat, coal, Hexamine fuel tablets and pellets made from wood, used as a fuel to produce energy by way of combustion to provide heat.

Wood Fire Heater is a residential solid fuel burning unit, that has controlled combustion.

Wood-smoke the products of a solid fuel heater wood combustion, consisting of fine particles and gasses.

4.0 History

The former Department of Environment and Conservation repealed the *Clean Air (Domestic Solid Fuel Heaters) Regulation 1997* and incorporated its provisions as Part 2 of the *Protection of the Environment (Clean Air) Regulation 2010* referred to from here on as; the Regulation. These amended regulations require all new solid fuel home heaters sold in NSW (local and imported) meet specific emission

standards. In 2000 tighter emission controls were adopted and since 2001 new heaters sold in NSW must comply with Australian Standard 4013.

The Regulation is designed to prevent air pollution from air borne particulates and chemicals to eliminate localised nuisance caused by smoke and odour generated by illegally modified and inefficient use of domestic solid fuel heaters.

There has been an increase in the number of enquiries relating to burning by residents within the Nambucca Shire. The majority of enquiries have related to smoke production, odour and human health effects.

5.0 Policy statement

5.1 Introduction

One of the most popular and important heating fuels in Australia, is firewood, as it provides effective and low cost heating. If it is properly managed this renewable natural resource does not significantly add to greenhouse gas emissions. In 1999 there were 1.5 million homes in Australia using woodfire heaters and Todd (2003) suggested that there was 40 000 tonnes of fine particulate matter and 240 000 tonnes of carbon monoxide emitted into the atmosphere annually. Poor combustion, usage and maintenance of heaters including inappropriate firewood harvesting is contributing to ecological damage in some regions (Todd 2003).

There is continuing reliance on solid fuel/wood fire heaters in the Nambucca Shire during the winter months and the smoke generated from these appliances is causing some health issues within urban areas. Local factors such as topography, meteorological conditions and cold temperatures create an optimum environment for temperature inversion layers that trap the wood smoke pollution close to the ground - this is evident on colder winter mornings.

The objective of this policy is to be able to significantly reduce the quantity of particulate matter and gasses emitted from wood-fire heaters in the Nambucca Valley, whilst maintaining the benefits of wood-fire heater use and wood fuel to ensure the sustainability of natural resources.

5.2 Environmental impacts

5.2.1 Health

Wood smoke contains toxic air pollutants such as benzene, polycyclic aromatic hydrocarbons (PAHs) and dioxins which are all known carcinogens (HB 170:2002). NSW Health (2003) reports that the fine particulate matter can affect respiratory and cardiovascular systems. Wood smoke causes temporary problems such as itchy or burning eyes, throat irritation, runny nose and illnesses like bronchitis. Existing heart and lung conditions such as angina, chronic bronchitis, emphysema and asthma can be aggravated by the fine particles (<2.5 microns) in the smoke by lodging in the lungs where carbon dioxide in the blood is exchanged with oxygen (HB 170:2002).

People that are most affected by wood smoke include:

- Those suffering from existing cardiac or respiratory conditions, such as asthma
- Those with vascular complications from diabetes
- Infants and very young children
- Frail older people

In 2008 Nambucca Shire had 38% of its population over the age of 55 (ABS 2010), and increased usage of wood-fire heaters and the associated air pollution may have a considerable effect on this ageing population.

5.2.2 Indoor health

If wood smoke leaks into living areas from a solid fuel heater, particulates and toxic pollutants are increased (self contamination). The smell of smoke is an indication of an indoor pollution event and probably a malfunctioning appliance. NSW Health (2003) states that Australian Studies have

demonstrated that particulate matter levels in homes with wood heating are much higher than homes without. The use of wood fired home heaters in regional towns is associated with elevated indoor levels of fine particulate matter even in those homes that do not use them.

The level of pollutants in wood smoke emitted from a solid fuel heater depends on the type, operation and maintenance of the appliance as well as the firewood used.

5.3 Selection of solid fuel/wood-fire heater

New heaters are more efficient and cleaner burning than the older (pre 2001) style wood heaters and open fires. All appliances currently sold must be certified and tested to the approved Standards AS/NZS 4012 and AS/NZS 4013. These appliances have a compliance plate attached to the body of the heater. This compliance plate provides information about the appliance, such as heat output and overall energy efficiency. These units have been tested for particle emission levels and have passed.

Selection of an appliance should be influenced by size, heat output and design in relation to the position of where it will stand, maximising the heat distribution throughout the home with minimal losses due to poor sealing and lack of insulation.

If the appliance does not have a compliance plate DO NOT PURCHASE as it is not rated to Australian Standards. Be aware of second hand appliances as these are usually older than 2001 and will not have compliance under the Australian Standard.

5.3.1 Chimney Selection

Traditional chimneys have a conical cap (fig 1) designed to prevent rain from entering the flue - these are usually sold in kit form with the solid fuel heater. The conical cap unfortunately forces the smoke in a downward direction.

A well designed flue should encourage the smoke to flow vertically, allowing it to be dispersed easily. Installing a concentric shroud (fig 2), venturi cowl or parallel excluder will allow the smoke to travel unhindered in an upwards direction and reduce the amount of rain entering the chimney.

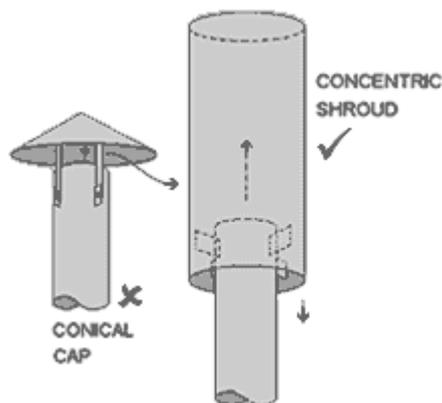


Fig 1 Old style conical cap chimney Fig 2 Preferred Concentric shroud (Source DECCW 2010)

The height of a chimney can minimise the effects of smoke on your neighbours. A well installed chimney should be at least 1 metre higher than any other building in a 15 metre radius. Topography has many effects on the behaviour of smoke and thus should be taken into consideration when installing a chimney.

5.4 Installation

Prior to the installation of any solid fuel/wood-fired heater (excluding portable appliances) an approval is to be obtained from Council under Section 68 Part F(4) of the *Local Government Act 1993* (LG Act). In addition, structural building work associated with installing solid fuel heaters may require development consent under Section 76A of the *Environmental Planning and Assessment Act 1979*.

Contact should be made with Council's Department of Development and Environment to discuss your proposal prior to lodging any application.

Approval is required as incorrectly installed or poorly designed appliances may have a significant adverse impact upon the home and surrounding properties.

There are no exemptions under this policy from the need to obtain Council approval. It should be noted that not all applications will be approved. There are locations where, because of topography or the proximity of multistorey buildings, smoke emissions from a solid fuel heater are likely to cause nuisance to neighbouring dwellings. In such circumstances alternative forms of heating should be considered.

Where approved, all solid fuel/wood-fired heaters must be installed in accordance with Australian Standard AS/NZS 2918 (Domestic Solid Fuel Burning Appliances – Installation) which specifies minimum clearances and thermal sheilding, and comply with Part 3.7.3 (Housing Provisions, Class 1 & 10 buildings) and Part G2 (for all other buildings) of the Building Code of Australia which contains the minimum mandatory requirements for building construction. Incorrect installation can have catastrophic consequences through loss of life and property.

The use of an appropriately qualified and experienced installer is strongly recommended.

5.4.1 Criteria to be considered by Council when granting approvals for installation

- AS/NZS 2918 – Domestic solid fuel burning appliances – Installation
- AS/NZS 3689 - Domestic solid fuel burning appliances – Design and Construction
- AS/NZS 4012 - Domestic solid fuel burning appliances – Method for determination of power output and efficiency
- AS/NZS 4013 - Domestic solid fuel burning appliances – Method of determination of flue gas emission
- AS/NZS 4886 - Domestic solid fuel burning appliances – Pellet heaters – Determination of flue gas emission
- AS/NZS 5078 - Domestic solid fuel burning appliances - Pellet heaters - Method for determination of power output and efficiency
- AS/NZS 60335.2.102 – Household and similar electrical appliances – safety – particular requirements for gas, oil and solid fuel burning appliances having electrical connections

In addition to the Australian Standards and BCA, Council will take into consideration installations on steep hills as cold air from higher ground flows into valleys and can carry smoke downhill. The pooling effect can trap smoke near the ground causing it to permeate into homes.

5.5 Operation

Correct operation of a wood heater improves efficiency and reduces air pollution.

Must be carried out as per manufacturers operating instructions/manual.

5.5.1 Starting a fire

A good fire should be started with kindling or small pieces of wood or alternatively, a solid fuel block. Once the fire has established add larger pieces one at a time gradually. The aim of this is to burn the fire hot so it does not smoulder and create smoke. The fire should only smoke when you first light it, a small amount when you add new fuel and then only for less than a minute. After about 8 mins your chimney should only be giving off a heat haze, with no visible smoke.

5.5.2 Maintaining a fire

The main aim is to keep the fire lively and bright and running efficiently. Before you add more fuel open the air intake and flue for 5 mins, add the fuel and leave open for a further 20 mins (DECCW 2010). Keep enough air in the fire to maintain a flame.

By loosely stacking the wood in the firebox, air can circulate freely and the fire can breath. If the wood is crammed in, the fire will be starved of oxygen and lose heat.

DO NOT leave the heater smouldering overnight. Leaving heaters overnight at the minimum air setting with a full firebox generates little heat and causes large amounts of smoke and pollution inside and outside the home. Limiting or closing the airtake causes the fire to be starved of oxygen and cannot burn properly.

Unless the appliance is designed for continuous operation (it will have an overnight setting if it is) let it go out overnight.

NB To help your health and the environment, spend money on house insulation rather than fuel.

An efficient fire will have bright swirling flames, glowing red embers and little or no smoke coming from the chimney

5.5.3 Chimney

Check the chimney regularly whilst the fire is burning. If smoke is coming out then you need to increase the air supply to the fire. If the fire smokes for more than 10 minutes from when you start it or more than a minute when you add fuel, there is something wrong with the fuel or operating method or in many cases both.

Creosote builds up in the chimney and make the heater inefficient. To remove this build up burn the fire fast for 1-2 hrs every day the fire is lit (DECCW 2010).

5.6 Firewood

Wood is by far the most common fuel used for solid fuel heaters. It is an inexpensive renewable resource and if used efficiently does not contribute significantly to greenhouse gas emissions. It has been shown that incomplete or poor combustion of wood fuel leads to high smoke and pollution emissions and contribute greatly to greenhouse gasses. Inappropriate harvesting or management of harvest areas contribute to ecological damage (Todd 2003).

The choice of firewood can have significant effects on the burning characteristics and efficiency of a heater (HB 170:2002). When purchasing firewood look out for:

- 1 Moisture content
- 2 Tree species
- 3 Piece size

- 1 The moisture content affects the rate at which the wood burns. Wood with a high moisture content is hard to ignite, slow to burn and the heat energy is used to boil off the excess moisture instead of heating. The fire is unable to burn hot and therefore smokes excessively. Wet or green wood with a moisture content above 20 per cent can generate 50% less heat than dry seasoned wood.

Freshly harvested firewood has approx 50 per cent moisture and after being cut and stacked can take up to 12 months to drop to 20 per cent or less if stored properly. Purchased firewood from reputable dealers cannot contain more than 20 per cent moisture. Dry wood will make a cracking sound if two pieces are banged together, wet will make a thud as it is denser.

Firewood should be stored as stacks or stacked in a criss-cross pattern if wet, under cover in a dry ventilated area. Do not cover with plastic as it will create an area of high humidity. The best way to start stockpiling wood is to start in summer, so that you have a continuous dry and seasoned supply over winter.

- 2 Softwood and hardwoods burn differently. Hardwoods, such as eucalypts, are denser and will produce a long lasting coal bed whereas softwoods, such as pine, will bring a fire to its optimum temperature quickly but will not sustain the fire alone. Hardwoods give lower emissions.
- 3 Firewood log size is important in the rate of combustion. Larger pieces release their energy at a slower rate than smaller pieces. Smaller pieces make a shorter hotter fire and larger pieces are used to extend the firing cycle.

It maybe cheaper to purchase larger logs but it is important to split them into smaller manageable pieces approx 10-15cm thick. Smaller logs dry faster than larger ones so splitting them before winter makes sense.

Always burn small logs of aged/seasoned, dry hardwood

For protection of the environment and sustainable use of firewood, ensure your supply is from a reputable dealer. Firewood harvesting can have serious effects on native flora and fauna. Dead trees and fallen timber can provide habitat for many species, such as birds, insects, reptiles and mammals. If you collect your own firewood make sure you leave some dead wood behind to provide essential habitat.

NEVER BURN

- **Rubbish**
- **Driftwood**
- **Painted wood**
- **Treated wood**
- **Coal or coke**

5.7 Maintenance

Little or no maintenance to a wood heater will create increased levels of smoke and air pollutants. Combustion is not a complete chemical process and the by-products are smoke, ash and creosote. For a wood heater to operate efficiently it must be serviced and maintained regularly.

General maintenance includes:

- General cleaning of firebox
- Checking seals/gaskets are still working and replace if worn
- Check all moving parts are operating correctly
- General cleaning of the flue and chimney annually
- Checking chimney is clear of blockages/small animals and birds

Please refer to the manufacturers operating manual and/or maintenance manual.

5.8 Role of Council

Not only is Council the approval authority for applications for installations, it is also the regulatory authority for illegal installations and smoke pollution complaints. Council will respond to all complaints about excessive smoke production from a solid fuel/wood heater in a residential premise.

5.8.1 Development Compliance - Local Government Act 1993

The following are development control tools that Council can use to ensure compliance.

5.8.1.1 Orders:

Section 124 of the *Act* includes a Table of Orders that may be given to certain people under certain circumstances. The following Orders in the Table may be used with regard to solid fuel heaters.

- Order 21: To do or refrain from doing such things as are specified in the Order to ensure that the land is, or premises are, placed or kept in a safe or healthy condition.
This Order could be used to protect the health of people within the premises where the heater is installed. This may be relevant where the owner of the premises lives elsewhere, such as in a rental situation.
- Order 30: To comply with an Approval for solid fuel heater installation.
This Order could be given instead of prosecuting a person for failure to comply with the terms of an Approval.

5.8.1.2 Nuisance:

Section 125 of the *Act* gives Councils the power to deal with public nuisance.

The *Act* advises that a nuisance is “public” if it “materially affects the reasonable comfort and convenience of a sufficient class of people to constitute the public or a section of the public”. Where a sufficient number

of people, even while in their homes, are subject to a nuisance from an existing solid fuel heater, this section may be used by Council to require the owner to minimise the pollution from the heater.

5.8.1.3 *Penalty Notice*

Where the above Orders are not complied with, Council may consider the issuance of a Penalty Notice resulting in monetary fines being applied.

5.8.2 *Development Compliance – Environmental Planning and Assessment Act 1979*

Any installation of a new solid fuel/ wood fire heating units undertaken under a development approval may be subject to compliance action under the EP&A Act 1979.

5.8.3 *Environmental Compliance – Excessive Smoke Production – Protection of the Environment Operations Act 1997*

The following are environmental regulatory tools that Council can use to ensure compliance.

5.8.3.1 *Prevention Notices*

If complaints come to Council about excessively smokey chimneys caused by a solid fuel/woodfire heaters, then Under Section 96 of the *Protection of the Environment Operation Act 1997* (POEO Act) Council can issue a Prevention Notice to the occupier of the premise. The Prevention Notice carries an administration fee. *The Prevention Notice is designed to set out actions that are needed so that an activity operates in an environmentally satisfactory manner. It is oriented towards finding solutions that would control the air pollution and cannot be used to simply ban an activity.*

A Prevention Notice can order the occupier to take action (without limitation) to include any of the following:

- a installing, repairing, altering, replacing, maintaining or operating control equipment or other plant,
- b modifying, or carrying out any work on, plant,
- c ceasing to use plant or altering the way plant is used,
- d ceasing to carry on or not commencing to carry on an activity,
- e carrying on an activity in a particular manner,
- f carrying on an activity only during particular times,

If the occupier does not comply with the Prevention Notice or smoke persists, then Council may issue a Penalty Notice that carries a penalty of \$750.00 for individuals and \$1500.00 for a corporation.

5.8.3.2 *Smoke Abatement Notice*

Council officers may issue a smoke abatement notice if it appears to the authorised officer that excessive smoke is being, or has been emitted from a chimney on or in residential premises.

Division 3 of the POEO Act addresses domestic air pollution by enabling a council officer to issue a Smoke Abatement Notice where excessive smoke from a domestic chimney is observed. The householder receiving a Smoke Abatement Notice has 21 days in which to fix the problem; for example by having the flue cleaned, purchasing better quality firewood or seeking advice on how to operate the wood heater or fireplace cleanly.

If the householder elects to take the matter to court, the maximum fine that can be imposed by the court is \$3,300. A Smoke Abatement Notice ceases to have effect after 6 months; that is, it is intended to apply only in the one heating season. The offence does not apply to smoke from an incinerator or to backyard burning generally since those matters are regulated under Part 3 of the POEO (Clean Air) Regulation 2010.

The notice must be issued within 7 days of the excessive smoke being emitted (s 135B(1) of the POEO Act).

Section 135A of the POEO Act defines 'chimney', 'excessive smoke' and 'residential premises' in relation to the provisions relating to smoke abatement notices as follows:

chimney means a chimney, flue, pipe or other similar means of conveying smoke emitted inside residential premises to the outside.

excessive smoke means the emission of a visible plume of smoke from a chimney for a continuous period of not less than 10 minutes, including a period of not less than 30 seconds when the plume extends at least 10 metres from the point at which the smoke is emitted from the chimney.

residential premises means premises used wholly or partly as a residence.

5.8.3.3 Penalty Notices

Councils may issue Penalty Notices in relation to air pollution offences. The following table sets out the offences that are related to smoke pollution from solid fuel/wood fire heaters or open fire places.

Table 1: Offences under the POEO Act for smoke pollution

Offence	Section of the POEO Act	Penalty
Failure to comply with a Prevention Notice	Section 97	\$750 for individual \$1500 for corporation
Failure to pay the Prevention Notice fee	Section 100	\$750 for individual \$1500 for corporation
Fail to comply with smoke abatement notice	Section 135c(1)	\$200 for individual \$400 for corporation

Council will provide information or instruction on correct wood heater operation to a householder before they consider issuing any regulatory enforcement tools.

5.9 Further Reading

- Do's and Don'ts of Wood Heating. DECCW fact sheet. Available [online] <http://www.environment.nsw.gov.au/woodsmoke/dosdonts.htm>
- Why is Woodsmoke a Problem? DECCW information. Available [online] <http://www.environment.nsw.gov.au/woodsmoke/index.htm>
- What you can do about woodsmoke pollution. DECCW information. Available [online] <http://www.environment.nsw.gov.au/woodsmoke/cando.htm>
- *Wood-Smoke Handbook: Woodheaters, Firewood and Operator Practice*, Eco-Energy Options, Environment Australia & NSW EPA. Available [online] <http://www.environment.gov.au/atmosphere/airquality/publications/handbook/pubs/woodsmoke-handbook.pdf>
- Legislative and policy framework for air quality management, DECCW Air Quality Toolkit Module 2. Available [online] <http://www.environment.nsw.gov.au/resources/air/module207268.pdf>
- Part 2 of the Protection of the Environment Operations (Clean Air) Regulation 2002. DECCW information. Available [online] <http://www.environment.nsw.gov.au/woodsmoke/poeoca.htm>

6.0 References

ABS (2010) Australian Bureau of Statistics, *National Regional Profile: Nambucca (A) (Local Government Area)- population and people*, Available [online] <http://www.abs.gov.au/AUSSTATS/abs@.nsf/Latestproducts/LGA15700Population/People12004-2008?opendocument&tabname=Summary&prodno=LGA15700&issue=2004-2008>

DECCW (2010) Department of Environment, Climate Change and Water, web based information. Available [online] <http://www.environment.nsw.gov.au/woodsmoke/resources.htm>

Environment Protection Authority (1999), *Environmental Guidelines for Selecting, Installing and Operating Domestic Solid Fuel Heaters*

HB 170:2002, *Wood Heating Resource Handbook – Guide to the selection, installation and operation of wood heaters*, Standards Australia/Standards New Zealand, 2002

NSW Health (2003) *NSW Health Factsheet – Wood Smoke from Wood-fired Home Heaters*, Available [online] http://www.health.nsw.gov.au/factsheets/environmental/wood_smoke_pub.html

Todd, J.J (2003) *Wood-Smoke Handbook: Woodheaters, Firewood and Operator Practice*, Eco-Energy Options, Environment Australia & NSW EPA. Available [online]
<http://www.environment.gov.au/atmosphere/airquality/publications/handbook/pubs/woodsmoke-handbook.pdf>

7.0 History.

Department:	Development & Environment	Last Reviewed	Resolution Number
Policy Category	Council	17 Mar 2011	?
Endorsed By:	General Manager		
Approval Authority	Council		
Policy Owner	MD&E		
Contact Officer	MD&E		
Document No.	27614/2010		
First Adopted	16 Dec 2010		
Resolution No:	?		
Review Date:	February 2019		

