

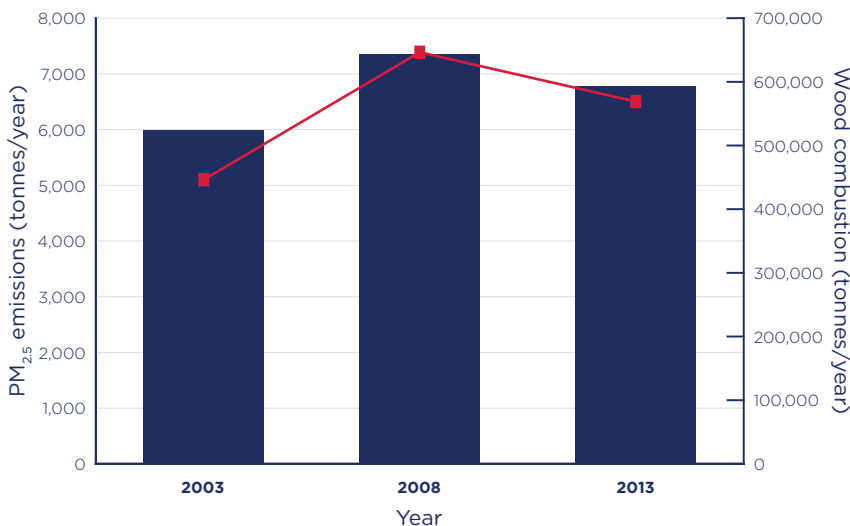
WOOD SMOKE



TRENDS IN WOOD HEATER USE AND WOOD SMOKE EMISSIONS

Wood heater use and the associated emissions peaked in the Sydney Greater Metropolitan Region (GMR) in 2008. Since then there has been a small reduction in emissions from wood heaters. This is mostly due to uptake of wood heaters with better emission controls and reduction in firewood burnt by about 8% from 2008 to 2013.¹

PM_{2.5} EMISSIONS AND WOOD COMBUSTION FROM 2003 TO 2013



On average a single wood heater will be **alight for 94 hours per week in winter** in regional areas.

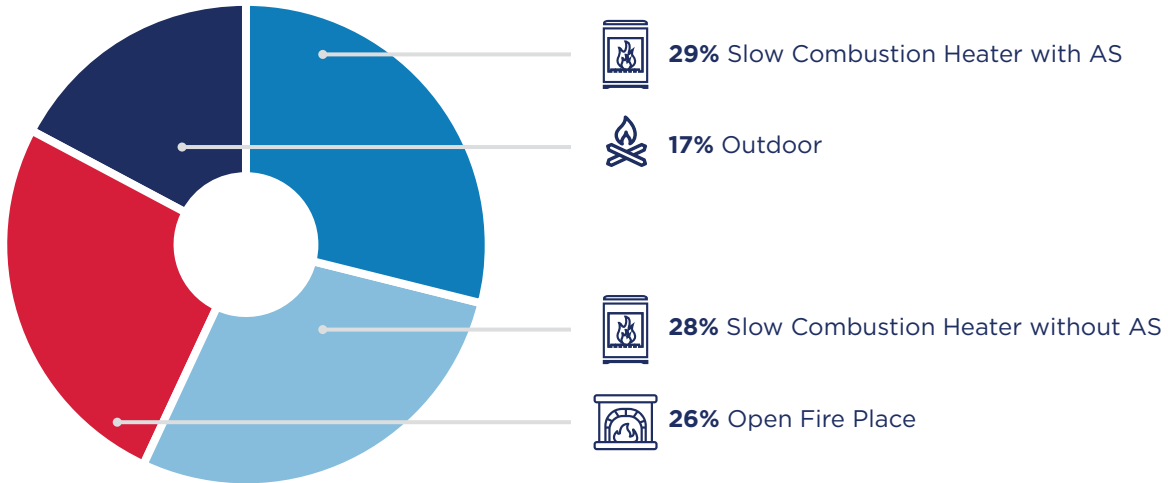
34% of the heaters will be alight for 24 hours a day in winter.

HEATER USE IN NSW

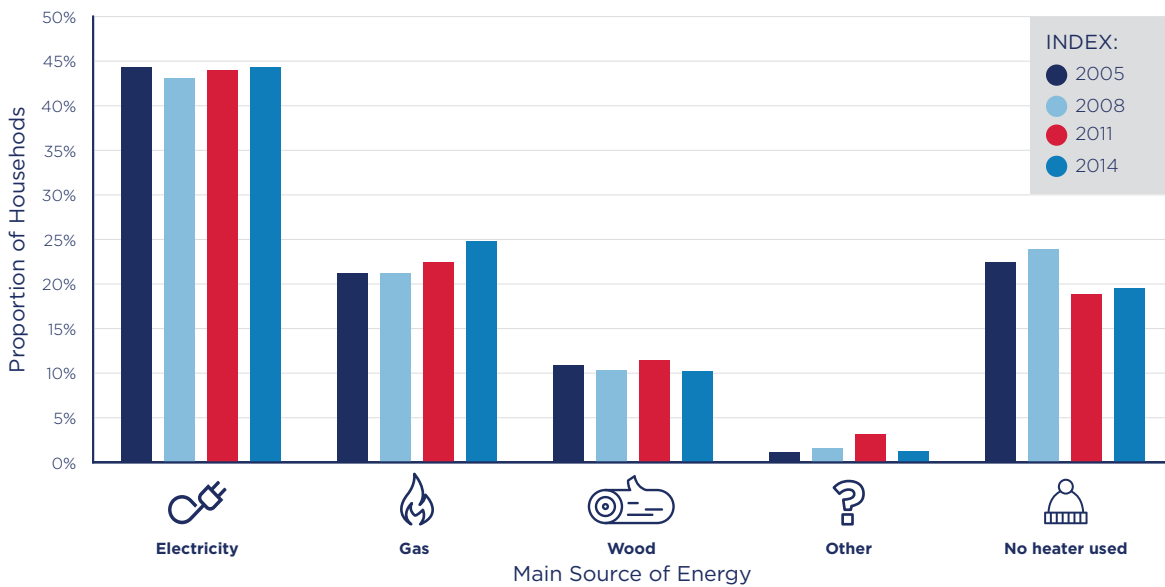
Heaters that comply with the Australian Standards (AS) are slowly beginning to outnumber older style wood heaters and made up 29% of the types of heater in use in NSW in 2013.

The EPA increasingly receives submissions and complaints about smoke from outdoor wood fires including barbecues, outdoor pizza ovens and fire pits.

PM_{2.5} EMISSIONS BY WOOD HEATER TYPE (TONNES/YEAR) IN GMR IN 2013²

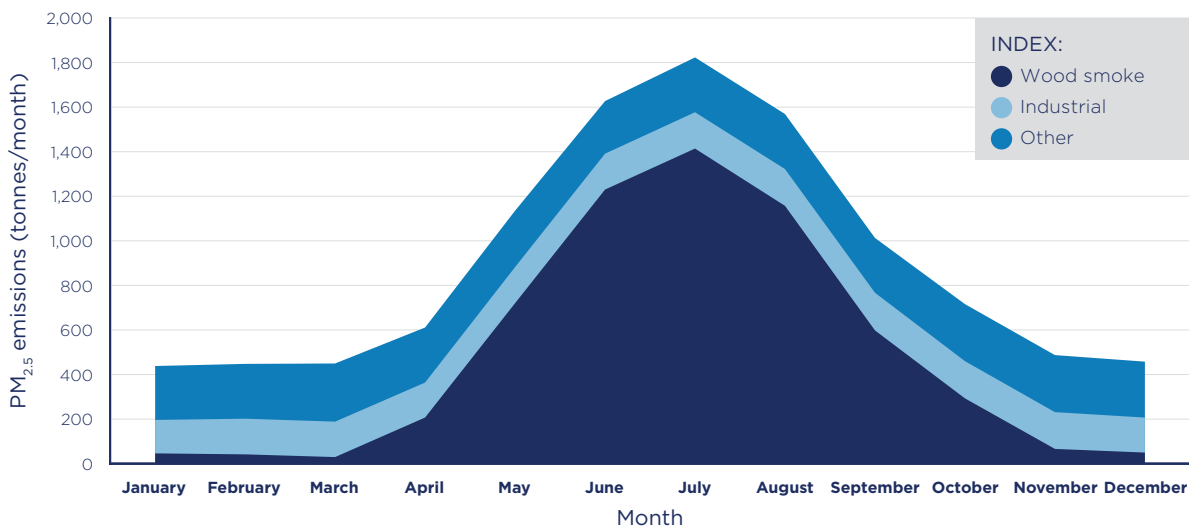


MAIN SOURCE OF ENERGY FOR HEATING NSW HOUSEHOLDS FROM 2005 TO 2014³



Wood smoke is the largest contributor to particle pollution in Sydney and many regional centres in NSW during winter months even though only about 10% of households in NSW chose wood heaters as a main heating source.³ In the Sydney region, domestic wood heaters contribute 47% of annual PM_{2.5} particle emissions. The contribution of wood smoke is highest in July, making up 75% of PM_{2.5} particle pollution according to the NSW Air Emission Inventory 2008⁴.

MONTHLY PM_{2.5} EMISSIONS IN THE SYDNEY REGION

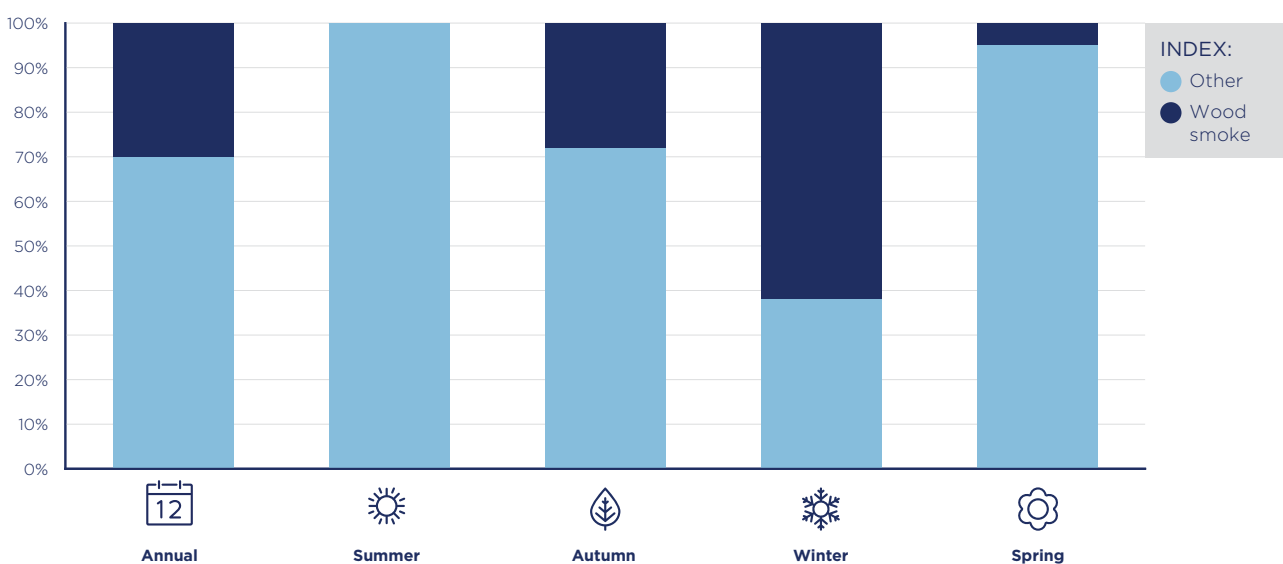


Wood smoke is also a pollution issue in regional areas and in some regional towns, such as Armidale, may cause up to 85% of particle pollution⁵. It can be a major source of particle pollution even in areas where there are other significant industrial sources, like coal mines and power stations.

The Upper Hunter Particle Characterisation Study based on sampling undertaken in 2012 found that smoke from domestic wood heaters made up 38% of fine particle pollution in Singleton each winter and 62% in Muswellbrook.⁶

The Lower Hunter Particle Characterisation Study in 2014-15 had similar findings. The annual average contribution of wood smoke to PM_{2.5} mass is about 10% across the region. Wood smoke contributes much more in winter: 41% at Beresfield, 31% at Newcastle and Mayfield, and 11% at Stockton.⁷

ANNUAL AND SEASONAL PM_{2.5} IN MUSWELLBROOK

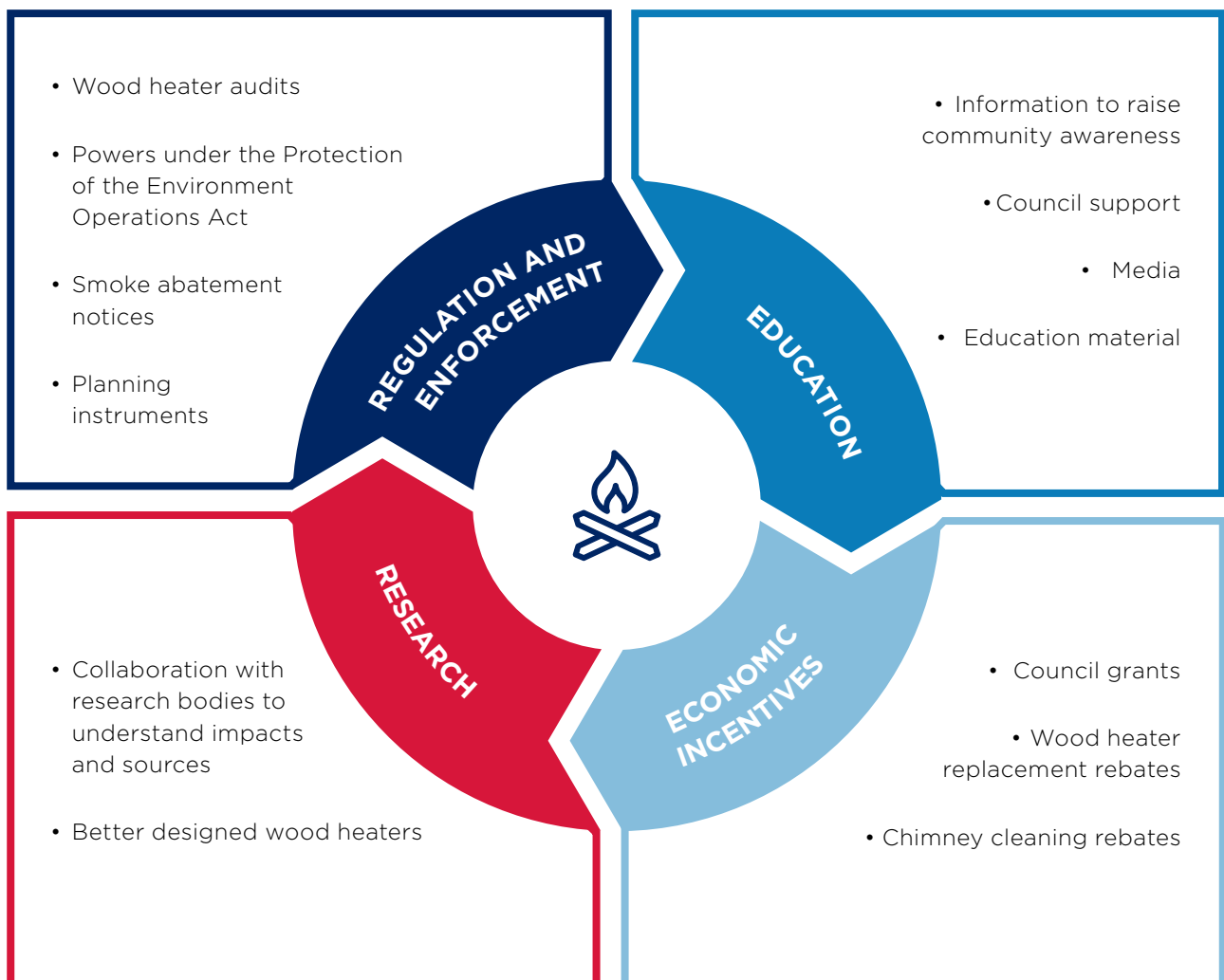


The effect of wood smoke on air quality varies from area to area and is related to a number of local factors. These include topography, prevailing weather conditions, housing density, and the number of wood heaters in use and how they are being operated. On cold, still and clear winter nights, wood smoke becomes trapped under a cold layer of air close to the ground rather than being dispersed or blown away. This elevates the levels of fine particles and causes the brown haze often seen on still winter mornings.

ADDRESSING WOOD SMOKE

Under the current regulatory regime in NSW, wood smoke is largely managed by local government. Local councils have regulatory powers to control installation of wood heaters using their planning instruments. The POEO Act gives local government officers powers to issue smoke abatement and pollution prevention notices; councils also handle complaints from residents and use education material to raise awareness about wood smoke impacts. The Environment Protection Authority (EPA) oversees the existing regulatory framework, collaborates with other jurisdictions, industry and academic stakeholders to improve wood heater emission and efficiency standards, and provides training and support for local councils on the regulatory and planning tools available.

WOOD SMOKE MANAGEMENT FRAMEWORK



Since 1 November 2016, new regulations require all new wood heaters sold in NSW to comply with tighter efficiency and emission standards. The EPA's compliance audit program aims to inspect 70% of all heater brands sold in NSW by 50 wood heater suppliers including all NSW based manufacturers and 70% of specialised retailers.

- 1 EPA. Air Emissions Inventory for the Greater Metropolitan Region, 2003 and 2013 (unpublished) <http://www.epa.nsw.gov.au/air/airinventory2008.htm>; and 2013 (unpublished)
- 2 Office of the Chief Economist, Australian Energy Statistics 2015, Table F2. <https://industry.gov.au/Office-of-the-Chief-Economist/Publications/Pages/Australian-energy-statistics.aspx#>
- 3 ABS 4602.0.55.001 - Environmental Issues: Energy Use and Conservation, Mar 2014 <http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/4602.0.55.001main+features1Mar%202014>
- 4 EPA 2012. Air Emissions Inventory for the Greater Metropolitan Region in NSW for the 2008 Calendar Year. Environment Protection Authority, NSW, <http://www.epa.nsw.gov.au/air/airinventory2008.htm>
- 5 EPA 2002. Ambient Air Quality Research Project (1996-2001). Environment Protection Authority, NSW, <http://www.environment.nsw.gov.au/resources/air/020035-dopahhm.pdf>
- 6 Hibberd MF, Selleck, PW, Keywood MD, Cohen DD, Stelcer E and Atanacio, AJ (2013). Upper Hunter Particle Characterisation Study. <http://www.environment.nsw.gov.au/aqms/uhagmnfpcs.htm>
- 7 Hibberd MF, Keywood MD, Selleck PW, Cohen DD, Stelcer E, Scorgie Y & Chang L 2016, Lower Hunter Particle Characterisation Study, April 2016. <http://www.epa.nsw.gov.au/air/LHairqualstuds.htm>