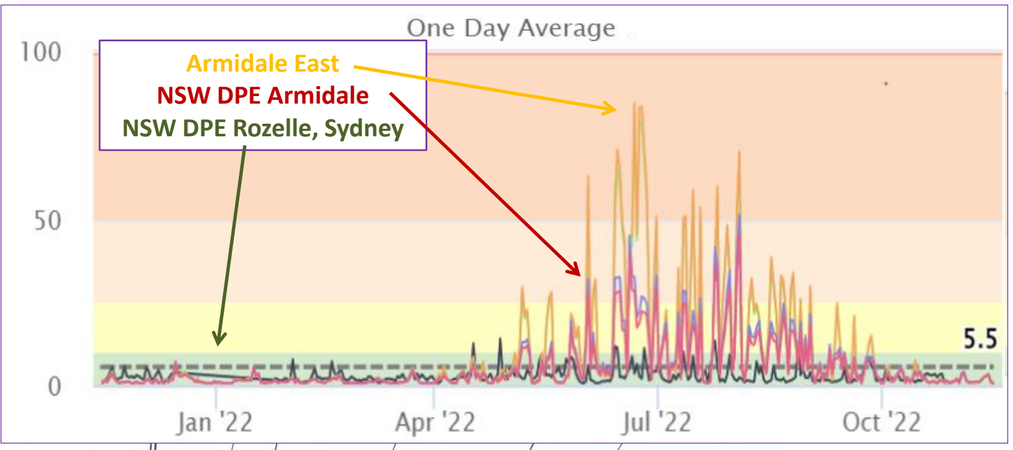
PurpleAir (PA) sensors help us understand air pollution, so we can develop strategies to protect public health

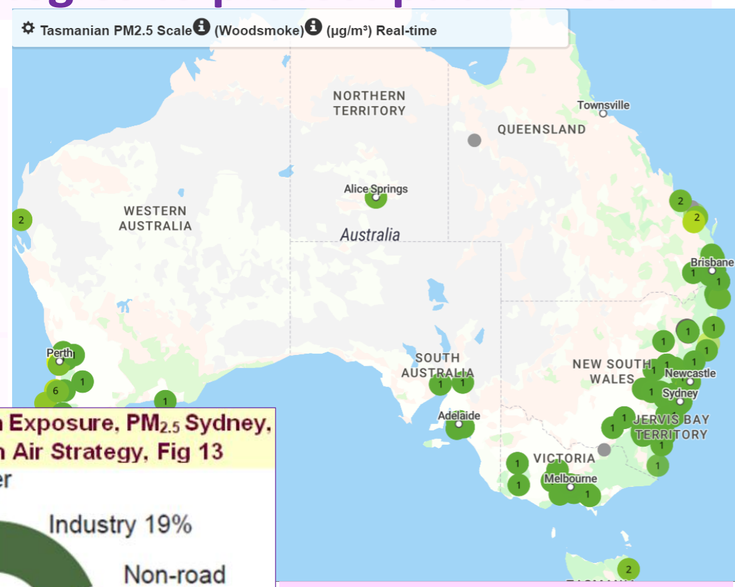


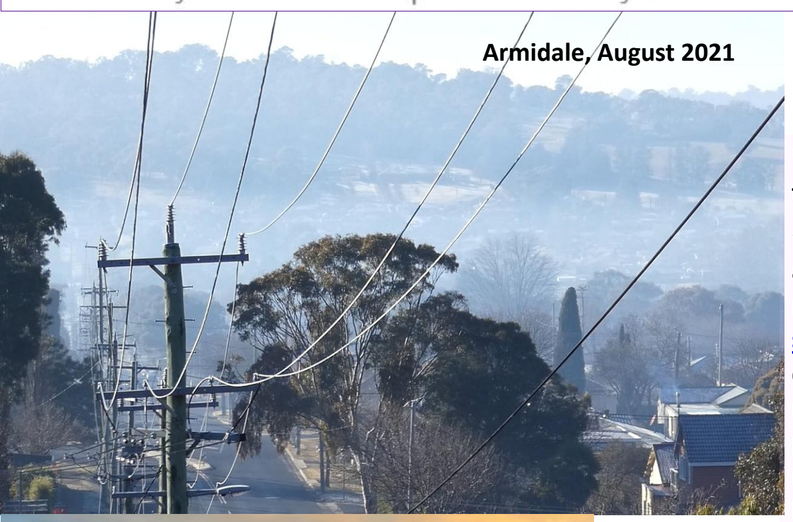
PA sensors make it easy to compare pollution at many locations throughout the world

The PA website can compare PM2.5 pollution at sites all over the world. Here, 1-day PM2.5 averages are shown using the PA woodsmoke calibration (shown to be stable over time) for an Armidale residential site and the NSW Gov DPE monitoring sites in Armidale & Rozelle, Sydney.

Armidale's big increase in wintertime PM2.5 illustrates the large impact of wood heaters, and the much higher pollution at the east Armidale residential area than the NSW government station.

Domestic wood heaters account for 46% of Sydney's annual population-weighted PM2.5 exposure (draft NSW Clean Air Strategy, 2021 and almost all Armidale's PM2.5 pollution, so the PA woodsmoke calibration is a useful way to compare sites. High wintertime PM2.5 pollution is also evident at Gunnedah, Orange, Wagga, Monash (ACT) & Christchurch (NZ).

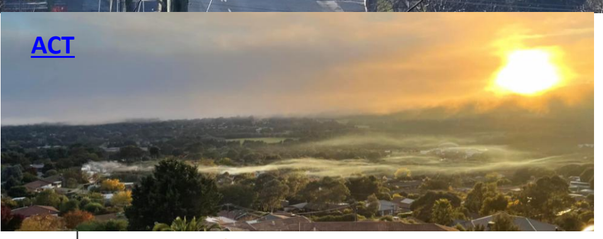




Developing public health protection strategies

* Air pollution measured by low-cost PA monitors can identify the worst-affected locations, times, likely sources & hot-spots.

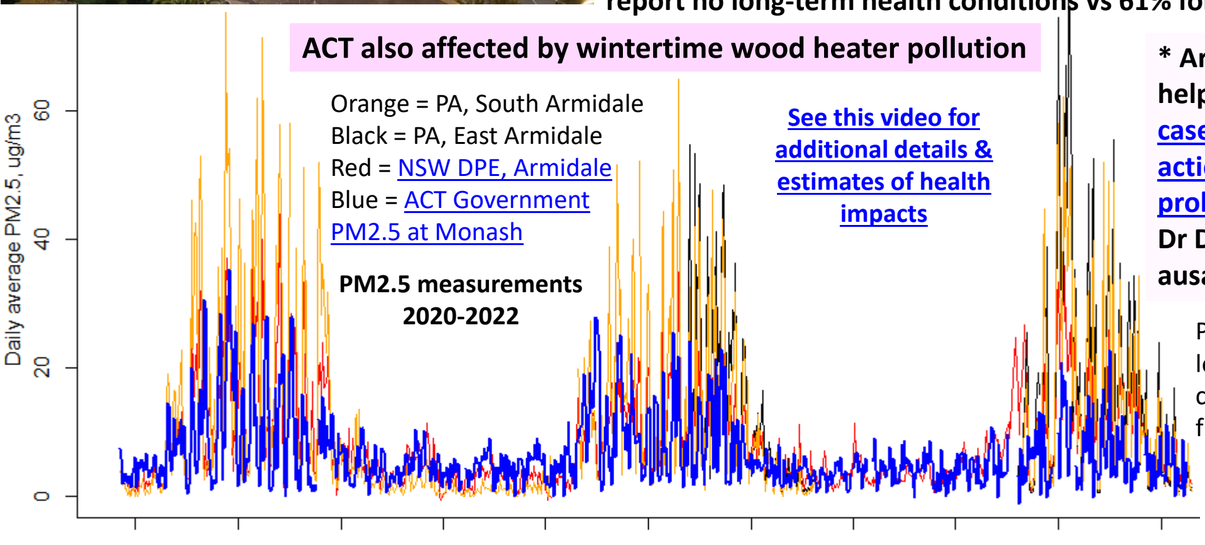
•In Armidale, Canberra, Sydney & Melbourne) wood heaters are the major source of pollution, so health professionals & researchers could get together to replicate Launceston's success from 2001-04 (not achieved anywhere in Australia) by developing new effective education strategies to make residents aware of the health impacts of wood heater pollution and obtain funding for advice and subsidies to replace wood heaters with cleaner alternatives that have lower running costs than buying firewood.



Armidale would make an excellent test case

•Armidale city would be an ideal test case because of high pollution levels & generally poorer health than the NSW average (2021 census: percentages with asthma, cancer, heart disease, lung diseases or stroke total 19.8%, compared to 17.1% for NSW; only 53.4% Armidale residents report no long-term health conditions vs 61% for NSW).

ACT also affected by wintertime wood heater pollution



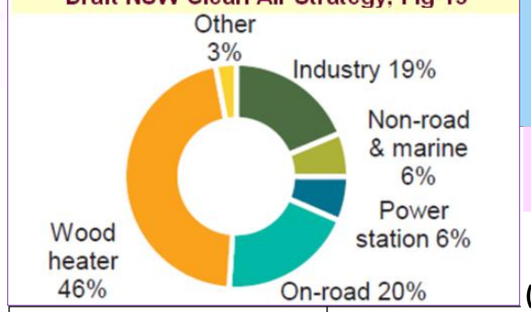
See this video for additional details & estimates of health impacts

* Are you interested in helping with a business case for research and action to solve the problem? Email:
Dr Dorothy L Robinson
ausairqual@gmail.com

PA data can be down-loaded for calibration checks, validation & further analysis.

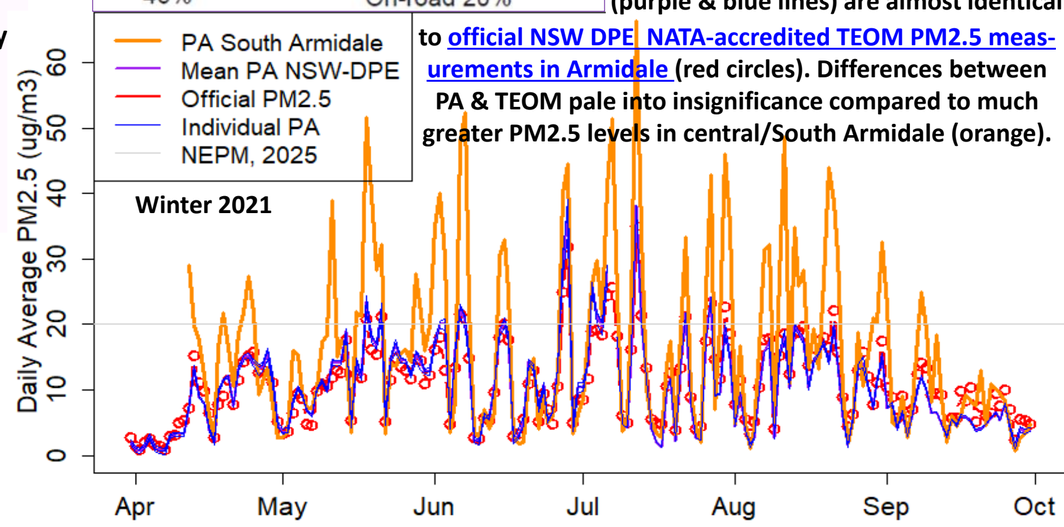
Poster: Dr Dorothy L Robinson, Australian Air Quality Group, ausairqual@gmail.com

Weighted-Population Exposure, $PM_{2.5}$ Sydney, Draft NSW Clean Air Strategy, Fig 13



Minimal PA calibration drift over 3 years

A study of co-located monitors shows that 3 years after initial calibration PA (purple & blue lines) are almost identical to official NSW DPE NATA-accredited TEOM PM2.5 measurements in Armidale (red circles). Differences between PA & TEOM pale into insignificance compared to much greater PM2.5 levels in central/South Armidale (orange).



High outdoor PM2.5 creates high indoor pollution

Indoor pollution, July-Aug 2022 in two older Armidale weather-board houses not using wood heaters in central/South & Central north-east Armidale.

The pollution is obviously coming from outside & exceeds outdoor pollution at the official NSW DPE site