

# Domestic burning

Professor Paul Lewis

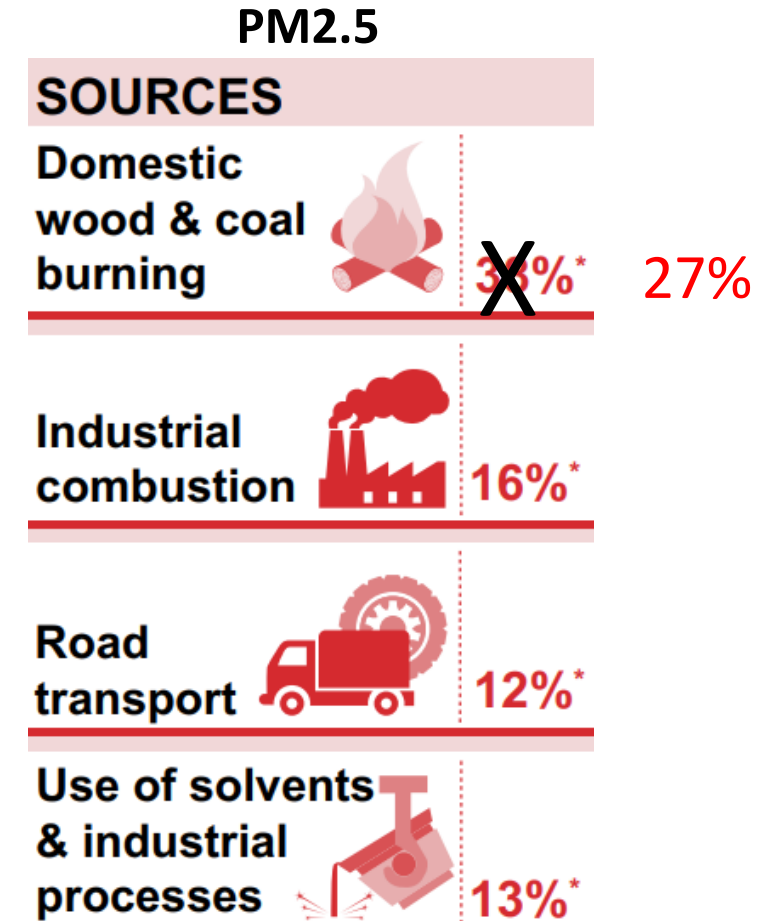
Clean Air Programme Regional Champion for Wales

Cross Party Group on a Clean Air Act - 27<sup>th</sup> February 2023



# Domestic burning

- Domestic combustion is a major source of particulate matter emissions
- In 2021....
  - 27% of PM2.5 emissions
  - 16% of PM10 emissions
- Wood burning is a major contributor to particle pollution
- In 2021 the use of wood accounted for 75% of PM2.5 emissions
- 8% of homes have wood burners
- Other pollutants from domestic burning...
  - CO
  - NO<sub>x</sub>
  - heavy metals (i.e. Pb, Cu, Fe, Zn, and Hg, etc.)
  - polycyclic aromatic hydrocarbons (PAHs)
  - other toxic compounds



# Main sources of domestic burning

Indoor

Outdoor

Wood burner stoves



Cooking



Barbecues

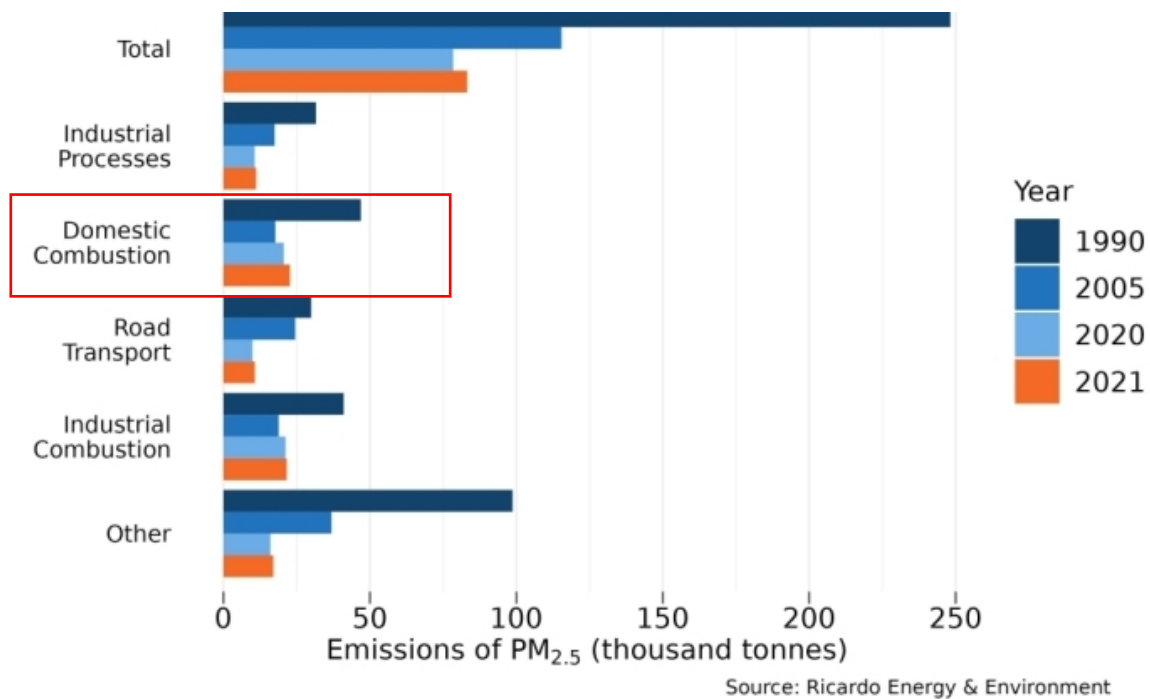


Bonfires

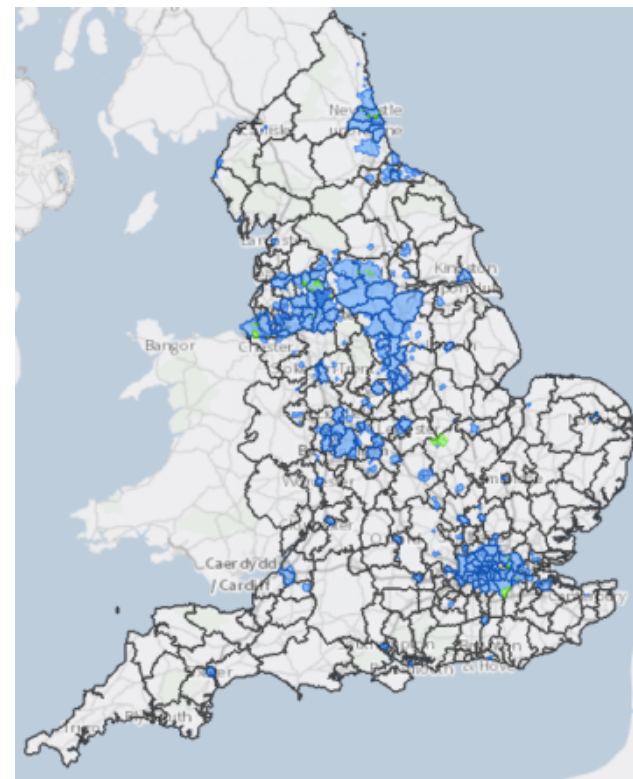


# Domestic burning

## PM2.5 emissions by sector

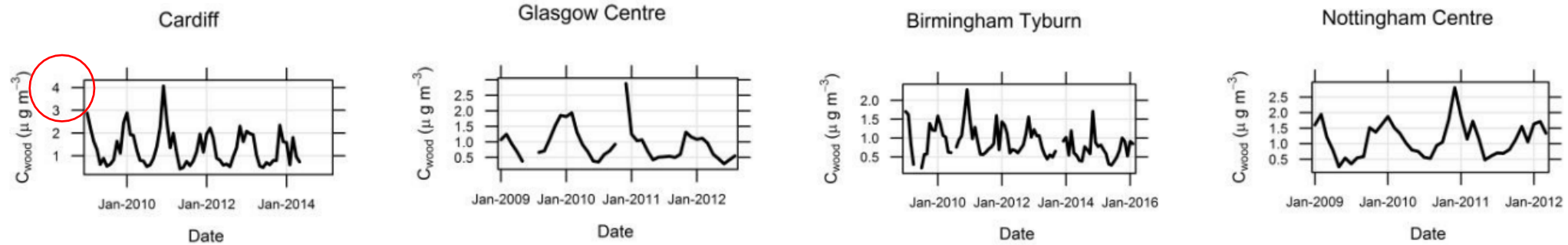


## Smoke control areas - England



# How much PM2.5 comes from wood burning?

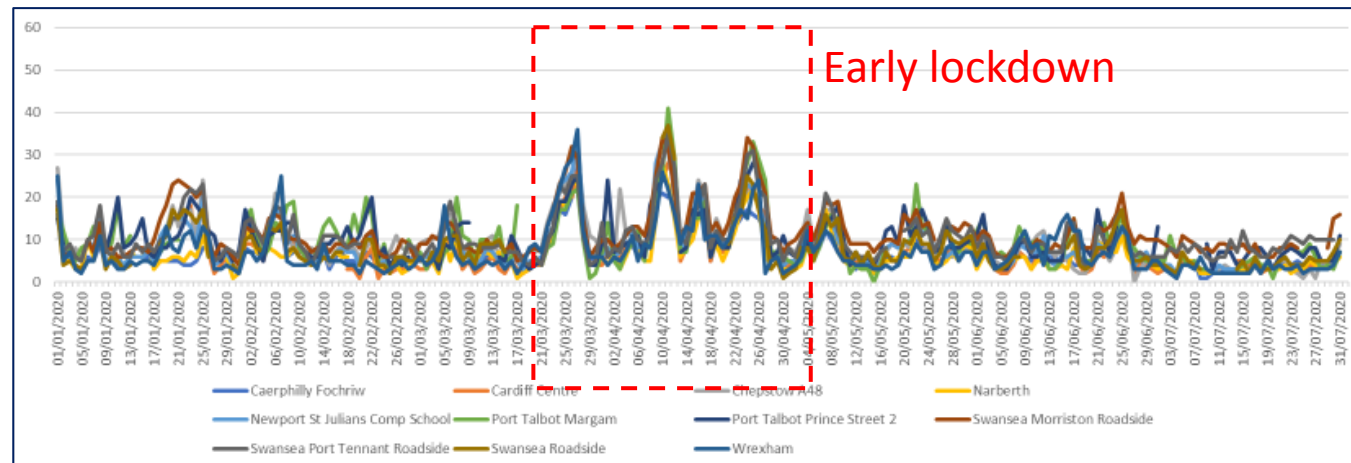
## Monthly mean wood contribution for urban background sites



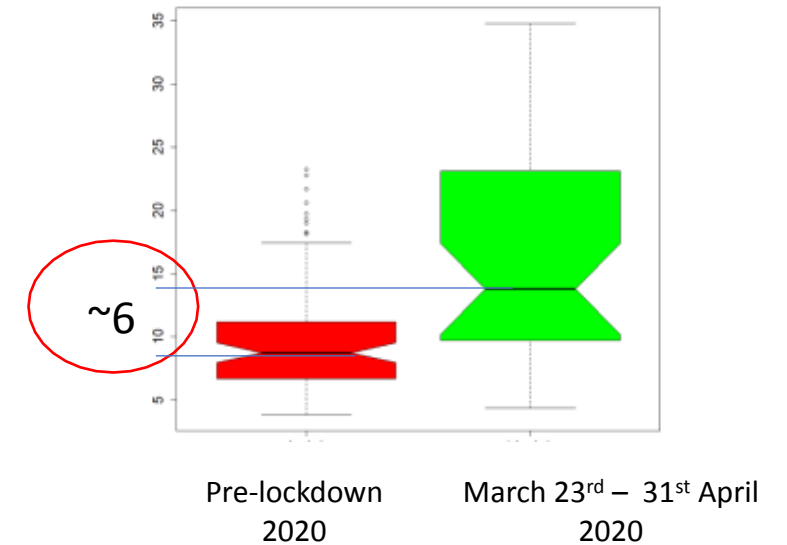
[https://uk-air.defra.gov.uk/library/reports.php?report\\_id=1005](https://uk-air.defra.gov.uk/library/reports.php?report_id=1005)

## PM2.5 during first Covid lockdown

### PM2.5 concentrations at AURN stations in Wales Jan 2020 – July 2020



## Swansea – Port Tennant



# White Paper on a Clean Air (Wales) Bill

## Proposals on smoke control for inclusion in the Bill:

- Include Smoke Control legislation, consolidating legislation from the Clean Air Act 1993, Part 3
- Change the offence regime from criminal to civil
- Mandate the application of Smoke Control Orders in all urban areas which meet specific criteria
- Require Local Authorities to review Smoke Control Areas on a regular basis
- Include outdoor combustion within Smoke Control Areas, to include bonfires
- Introduce an online list of authorised fuels for use in outdoor appliances

## Considerations to tackle air pollution from domestic burning:

- Prohibit sale of wet wood and traditional/bituminous house coal
- Test standards for new manufactured solid fuels entering the market by 2024 to ensure they are compliant with regulations
- Options to support households to prevent fuel poverty after ban on fuels or appliances, or extension to the use of SCAs
- **Regulatory powers to ensure only the most efficient appliances are available for purchase and installation by 2022**
- **Regulatory powers to require the annual maintenance of domestic burning appliances by a certified professional**
- **Enhance existing powers for smoke control from domestic burning (PM2.5)**

# Wood burning stoves – meeting new standards

## Standards for wood burning stoves

- Since January 2022 all new wood burning stoves have to meet new EcoDesign standards.
- European Environment Bureau report (2021) showed that Euro-certified 'Eco-stoves' produce 750 times more PM2.5 per unit of energy produced than a modern HGV
- Burning just 1 kg of wood will pollute 500,000 m<sup>3</sup> of completely clean air up to 10 µg/m<sup>3</sup>

[https://eeb.org/wp-content/uploads/2021/09/Where-theres-fire-theres-smoke\\_domestic-heating-study\\_2021.pdf](https://eeb.org/wp-content/uploads/2021/09/Where-theres-fire-theres-smoke_domestic-heating-study_2021.pdf)

## Indoor air pollution from stoves

- Sheffield study showed that PM2.5 was higher by 196.23% in houses with frequent use compared to infrequent users.
- PM 'floods' into indoor areas when stove door opens.

**“With regulatory encouragement stove designs can be modified in a way that limits flooding”**

**“Also recommended that new residential stoves be accompanied by a health warning at the point of sale”**

# Public knowledge, attitudes, behaviours and motivations

## General

- 19.4% of UK adults burned solid fuels in their home and/or garden in year prior to being surveyed
- Those who burned both indoor and outdoor more likely to have income > £50,000 / yr

## Indoor burners

- 68% of indoor burners live in urban areas
- 58% said that stoves were the main appliance and only 31% burned on open fires
- People burning solid fuel systems for their heating (11%) more commonly located in rural areas
- Burning of household waste indoors is infrequent

**KANTAR**

Burning in UK Homes  
and Gardens

Research Report



Prepared for the:

  
Department  
for Environment  
Food & Rural Affairs

December 2020, Version 1.0, Project ID (Oriskany number): AQ1017  
26 40473602



# Public knowledge, attitudes, behaviours and motivations

## Outdoor burners

- 82% live in urban areas and more likely to rent their property
- Major driver for outdoor burning was cooking - more common among urban affluent younger families
  - 46% burned charcoal
  - 15% burned waste wood
  - 14% burned household waste
  - 12% said they burned garden waste
- Burning waste by bonfires more common in rural areas and amongst retired households
- 2% said they burned plastics

# Public knowledge, attitudes, behaviours and motivations

## Are burners aware?

- 46% of indoor burners agreed that burning in homes and gardens is a significant source of air pollution
- 42% of outdoor burners agreed that burning in homes and gardens is a significant source of air pollution
- 53% of non-burners agreed that burning in homes and gardens was a significant source of air pollution
- 32% of indoor burners in urban areas did not know whether they were living in SCA
- 29% of indoor burners who thought they did live in an urban SCA didn't!

## Do they care?

- Only 27% of indoor burners expressed concern about the impact on their health and those around them
- Only 32% of outdoor burners expressed concern about the impact on their health and those around them