A review of the impact of domestic combustion on UK air quality

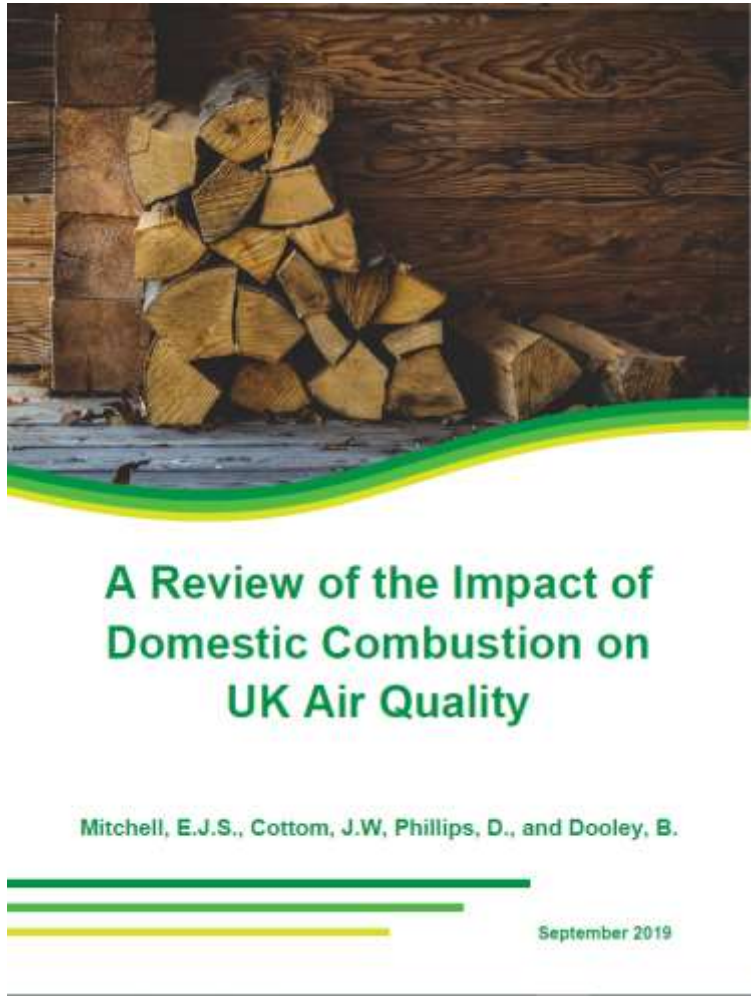
Commissioned by HETAS & supported by the SIA

Much of the research and data we and others (like Defra and AQEG etc) were relying on was some years old. There was a need to pull together a wider range of more up to date research

- Authors' Ed Mitchel PhD, J. Cottom PhD, D Phillips PhD and B Dooley PhD were chosen to conduct the research and to report.
- The work was reviewed by Prof. Jenny Jones and Prof. Alan Williams

All concerned have relevant background and experience

The Report and a Summary



This presentation gives a brief summary

The proportion of particulate emissions attributed to residential burning has been published as 38%. Consideration of this figure prompted significant debate.

- How much of this is UK emissions when 50% are from oversees?
- How much of it can be from residents fires and stoves rather than from bonfires, barbeques, log pits, chimeneas and uncontrolled agricultural burning for instance?
- How could anyone tell the sources of emissions in order to make a statement with any certainty?

Sources of emissions residential burning ??

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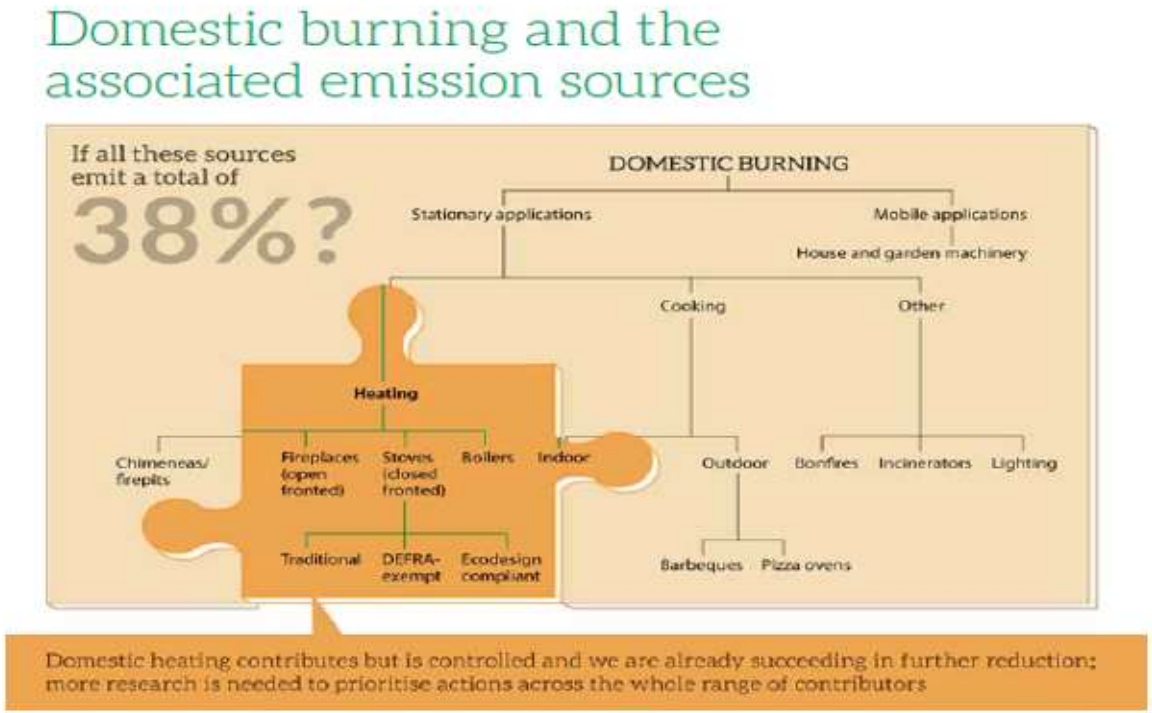


Existing source apportionment methods

Top down source apportionment –

- Levoglucosan was used as a marker and to support the calculations. This chemical is a marker in other biomass fuels and is also present in emissions from prescribed burning and wild fires, as well as wood log fuels for domestic use
- Accuracy of measurement has recently improved greatly with new aethalometers measuring 7 wave lengths rather than 2 as were used for previous reports. The modern instruments have not been used widely in UK yet.

Existing source apportionment methods

Bottom-up source apportionment –

- Some reports have relied on a method where the annual tonnage of fuel used was estimated and an emission factor applied.
- Older estimates, used to inform important reports, suggested 4.8M tonnes of wood fuel whereas recent information (a wide ranging SIA survey and FC estimates) suggest the volume is 1.85M tonnes.
- Such ambiguity makes prioritising difficult

Primary and Secondary emissions

Primary emissions are those which are released directly in to the atmosphere;

- Primary PM from modern Ecodesign compliant appliances can be 80% even 90% less than old open fires (source Supergen Project Dr Amanda Lea Langton)
- Secondary emissions come from the release of high levels of precursor gases like VOC's and NOx and modern cleaner burning appliances operating at a steady state can reduce such emissions to near zero

Source apportionment and future techniques for measurement

More accurate measurement is now possible using a mix of appropriate techniques:

- Use modern aethalometers including 7 band models
- Accurate reporting of fuel markets an the various categories
- Wider chemical analysis techniques like chemical mass balance, positive matrix factorisation

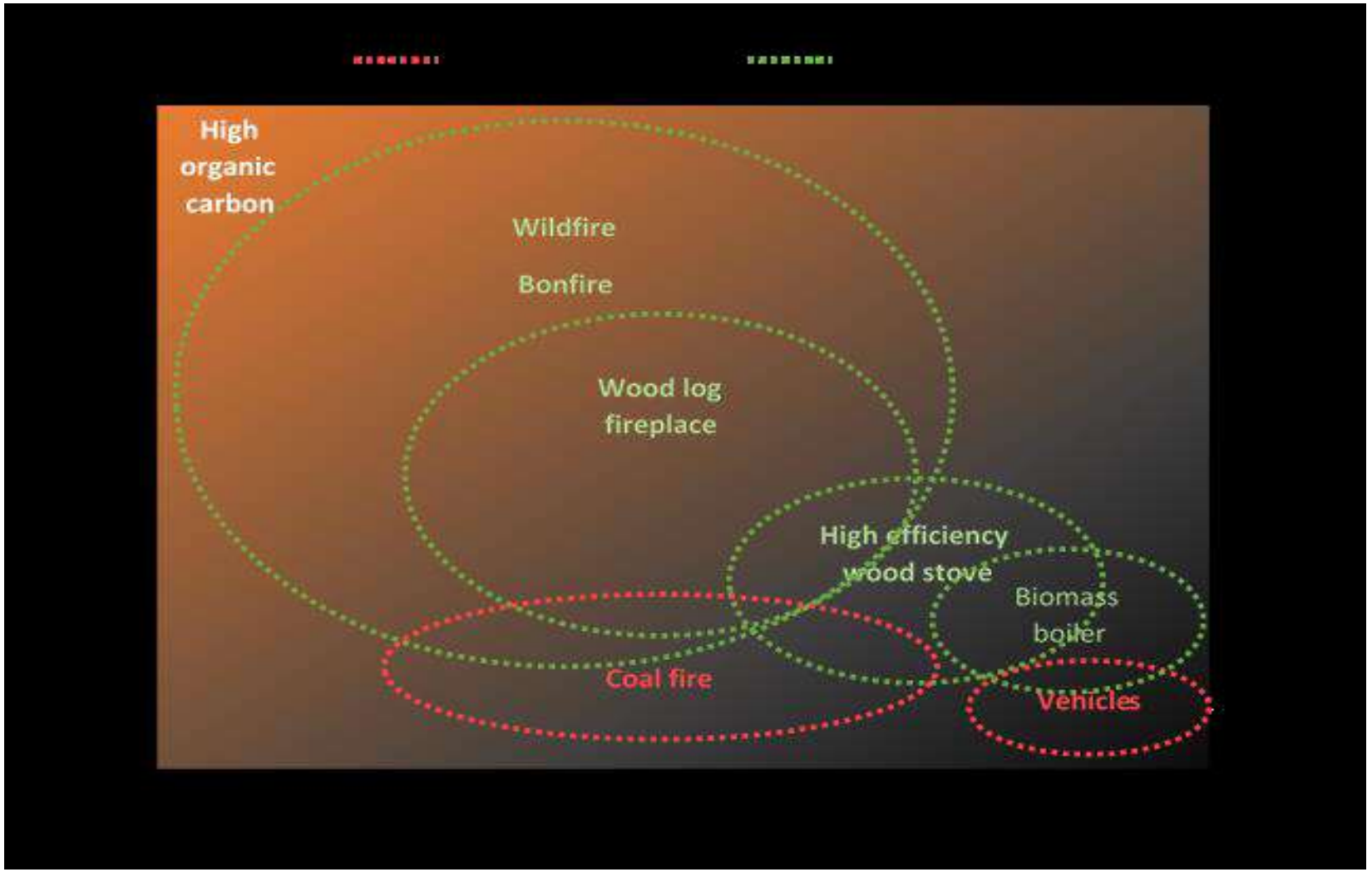
We need accurate and robust source evidence

Actions - Importance of fuels and appliances

Modern appliances using clean dry, good quality fuels are incredibly clean when compared to older stoves and open fires utilising house-coal as a fuel;

- The cleanest fuels in the more advanced stoves, operated in accordance with environmentally responsible burning techniques will greatly reduce emissions
- A move to Ecodesign compliant appliances; exempt for use in smoke control areas; using certified fuels like dry wood and smokeless fuels will greatly improve things

Prioritising actions



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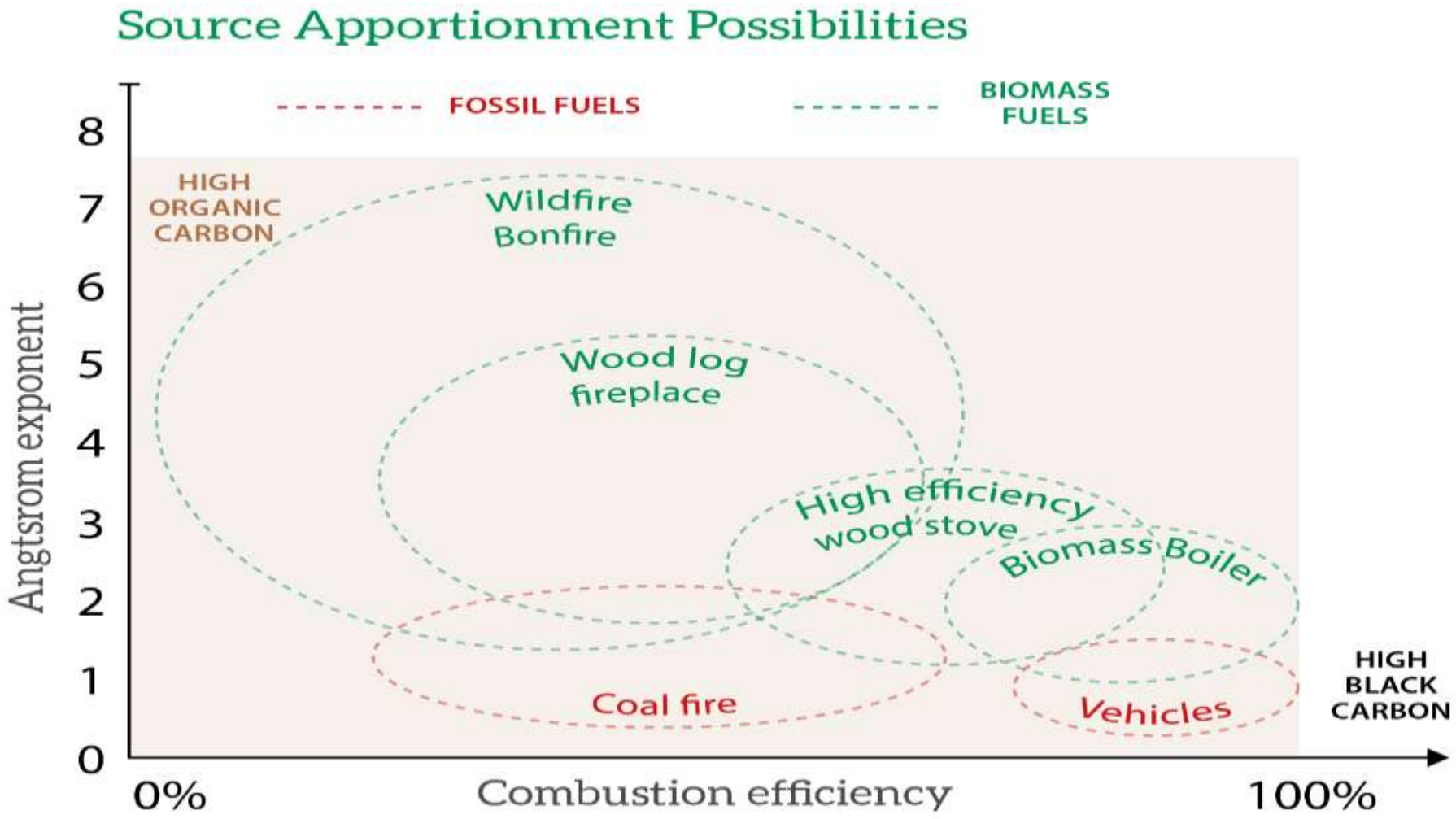

Recognising the cleanest burning appliances and Fuels

Consumers must be able to recognise the cleanest appliances and fuels from those which are less beneficial: -

- Ecodesign full compliance will remain high on the political agenda along with smoke control area exemption where appropriate
- Authorised fuels will remain an important differentiator – additionally we are working with Gov't to establish a classification criteria for new and innovative fuels which may offer benefits
- There will be schemes which demonstrate that some appliances and fuels have met higher standards than those required by law. All will be useful in encouraging environmentally responsible burning.

How can we promote environmentally responsible burning?

Regardless of the final percentages of emissions attributed to a variety of combustion sources, we have a job to do:-

- We need work on robust source apportionment to prioritise activities
- We need installers, service engineers and sweeps to educate on wood burning and other SF use
- Organisations like HETAS/Woodsure have a trade and consumer education role

Chimney Sweeps' role

Chimney Sweeps:-

- With Chimney Sweeps being in the customers' home most regularly, the importance of quality sweeps able to give good burning advice has become more recognised
- The HETAS Approved Chimney Sweep scheme is the fasted growing scheme we operate – we have a "find a sweep) web page
- We have worked through the Chimney Safety Group to engage with the main Sweep's Associations and we are engaging with the non-association Sweeps in a different way now.
- We are working on establishing robust standards and towards a technician status for those who install, sweep and service – and at the same time educate customers on cleaner burning.

Recommendations

The report demonstrates robustly that in order to understand particulate source apportionment, more work is needed and at the same time some practical measures can be adopted for immediate benefit:

- Increased education of installers, sweeps, retailers, service agents – helping educate consumers
- Public education programmes
- Apply regulation to the most polluting sources
- support replacing dirty fuels with cleaner and only allow the purchase of dry logs and certified fuels as this benefits old and new appliances alike
- Support replacing older appliances with new (around 27% are older than 10 years)
- Encourage only renewable fuels
- More research in to analysis and reporting methods leading to better source apportionment.

Questions ?

- Scientific report available at

https://www.hetas.co.uk/understanding-the-impact-of-domestic-wood-burning/

- Summary document available to be distributed after the event