Innovations in biomass installation – a challenge

Wood Heat – 25th October 2023

Our Perspective

Working together for a cleaner, safer and more sustainable environment.

Our Mission is that HETAS supports cleaner, safer and more sustainable choices for the efficient use of biomass and other solid fuels, appliances, and associated technologies.

In this presentation

I would like to look at some of the drivers for innovation and pick out specific influences for discussion (accepting there are others):

1. **The air quality driver PM2.5 and very fine particles – emissions factors**
2. **Air quality – other pollutants**
3. **Abatement**
4. **Innovative fuels**
5. **Sustainability – emissions factors**
6. **Government policy, such as the Biomass Strategy 2023**

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Particulate Matter (PM – PM2.5) – agree on a definition for today

One Government website defines it this way –

"Particulate matter (PM) is a term used to describe the mixture of solid particles and liquid droplets in the air. It can be either human-made or naturally occurring. Some examples include dust, ash and sea-spray. Particulate matter (including soot) is emitted during the combustion of solid and liquid fuels, such as for power generation, domestic heating and in vehicle engines".

Air Quality - Particulate emissions

Remembering that the term "emissions" covers a range of particles. Government's Environment Improvement Plan (EIP) documents the following:

"Legal emission reduction targets for five damaging pollutants by 2030 relative to 2005 levels:

- **Reduce emissions of nitrogen oxides by 73%.**
- **Reduce emissions of sulphur dioxide by 88%.**
- **Reduce emission of PM2.5 by 46%.**
- **Reduce emissions of ammonia by 16%.**
- **Reduce emissions of non-methane volatile organic compounds by 39%."**

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Air Quality - Particulate emissions (2)

Remembering that the term "emissions" covers a range of particles. Government's EIP documents the following:

- **Reduce emission of PM2.5 by 46%.**

Let's ask ourselves "how would we know if we are improving – and when would we know?

Understanding direction of travel – how can innovation help?

1. **We (Defra supported by DESNZ) look at where we are now e.g. various air quality inventory reports and measuring at roadside monitoring stations etc – things are moving on.**
2. **Estimating the fuel used and giving each an emissions factor – current work by Defra – replacing old**
3. **Looking at the future and making predictions/estimates etc – but based on what?**

Partially based on planned innovation and predicted performance data? e.g. Ready to Burn requirements in England for wood and smokeless mineral fuels whilst banning smoky and high sulphur fuels (what effect?); the effect of fuel quality requirement on NDRHI biomass use?

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What is innovation in our sector?

It depends on your perspective but today we might suggest it includes:

- **Good quality and sustainable fuels – can we do more (or better)?**
- **If we put these fuels into boilers, how will they perform – are there tests or even test standards to support measurement and reporting ?**
- **What is the affect on particulate emissions and pollutants? How do we measure this?**

Measuring improvement

- **Have we access to modern up-to-date standards and methods ?**
  - **To recognise each various particle type?**
  - **To count particles?**
  - **To measure the size of particles?**
  - **To do this consistently across laboratories or for on-site sampling?**
  - **Additionally, to use a method of "scoring" sustainability ? (DESNZ project already started – carbon emissions factors).**

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Innovation in biomass installation – the original discussion

Innovation stages and challenges;

- **Can we innovate if we are not sure what our innovations will be measured against? Yes, although its challenging**
- **Are there adequate standards in existence – yes, for what we are doing now maybe (some would say no)? Although maybe not for the future?**
- **Must we start with knowing what and how to measure?**
- **Starting at the forest end with future planning and management?**
- **Matching heating technology to existing and new/future fuels**
- **Considering a range of pollutants**
- **Look also at abatement technologies.**

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Summary

In terms of engineering expertise and appliance/system design, there is no doubt that our sector has many talented and innovative people and companies. We need to be sure that they are provided with the right environment to do their best work:-

- **Understanding policy aspirations**
- **Access to research and to modern standards and regulations**
- **Information about new and innovative fuels**
- **Knowledge of the various emissions factors for pollution and sustainability**
- **A firm basis for investment and innovation**

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Thank you for your time!