

Strategies for Reducing Air Pollutants from Wood Combustion

Workshop Report

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Expert Roundtable
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Summary

This IEA Bioenergy Task 32 expert round table discussion was aimed to bring experts to share their local and national strategies to reduce air pollutants from wood combustion. It has, once again, demonstrated that many regions with a significant share of residential wood heating appliances suffer from high pollutant emissions. And regions implement a wide variety of measures that are quite innovative to address the problem. The roundtable was moderated by Sebnem Madrali from Natural Resources Canada.

Expert Roundtable

The expert round table discussion was started with a presentation by **Hans Hartmann from the Biomass Research Centre TFZ in Germany**. The presentation was based on a recent compilation of emission abatement measures in nine IEA Bioenergy member countries, "[Inventory of national strategies for reducing the impact on air quality from residential wood combustion](#)". In the study, a total of 15 fields of action were considered and analysed, including stove replacement regulations, bans for wood fuels, tightening of emission limits, inspections of appliances, fuel certificates, stove or boiler certificates, particle precipitators or catalysts and information campaigns on correct stove operation. The report shows that in several fields of action the member countries are following very similar pathways. For example, localised or time-limited wood incineration bans are very common, and there are also many similar examples of information campaigns or training courses. For Germany, the presenter considers the regular stove and boiler inspections in private households in Germany to be particularly effective.

The presentation by **Cory McDonald is with Air Quality of the Department in Fairbanks North Star Borough and, Steven Hoke is with Alaska Department of Environmental Conservation**, focused on the unique challenges faced in Fairbanks. Primarily, during the winter periods from October through March when extremely strong temperature inversions are frequent. In these conditions, log wood stoves become primary heaters running beyond 96 hours at a time. When an inversion weather situation occurs, it traps the emissions close to ground level, acting "like putting a big pot lid on top of the whole region". Fairbanks Borough has made progress improving the ambient air quality, through multiple measures such as changeout programs, stringent requirements for appliances, media campaigns, controlling cord quality (moisture content is below 20 % and split into minimum three pieces). The speakers also highlighted the large deviations found in stove

performance levels between those reported in EPA certification reports and those reflecting stove operated in a home. This made the authorities to develop a higher standard requirement and allow only those appliances that meet stringent emission levels. In the discussion afterwards this point was strongly focussed. Similar findings in a Danish assessment had recently showed the same pattern when stoves were retested, resulting in about 80 % failure, compared to the requirements in Europe. It was concluded that a more intensive market surveillance for log wood stoves is badly needed, although this is an expensive undertaking.

Steven Law, from the Ontario Ministry of Environment, introduced a new guideline “[Guidance manual on managing air emissions from small solid biomass combustors](#)” published by Canadian Council of Ministers of Environment. The guideline is meant to provide key principles and options for managing air emissions from small solid biomass combustors in Canada, addressing wood combustor between 50 kW and 5 MW of thermal output. Small wood combustors, such as those used in single-family homes, are currently excluded from the scope. The manual offers a three-tier approach with stricter rules at higher-tier levels. Tier 1 is most suitable for rural and northern communities with low population density; tier 2 applies to more densely populated areas or those with sporadic air quality concerns; tier 3 is meant for larger urban agglomerations and areas that already experience high pollution levels.

David Dubois from Fink Machine, who is also the Councillor of the Canadian village of Cache Creek in British Columbia, shared his experiences as the equipment supplier and presented view of small Canadian municipalities. Major drivers for the communities that are looking into biomass are economical and environmental, particularly in areas where there is no natural gas. Recently, reduction of wildfire risks by forest management is becoming a driver. Small municipalities face multiple challenges, such as limited capacity to develop and implement air regulations, do development work, lack of knowledge etc. Northwest Territories was given as an exemplary example of local government which can use their infrastructure to make a switch to bioenergy and build a culture of support.

In the open discussion, the current ability to distinguish between good or bad heating appliances is questioned, at least this seems true for log wood stoves. The creation of test procedures which are closer to real life operation appeared to be a common goal. There was an agreement among panel members on the importance of intensifying user instructions and increasing user awareness for their responsibility on controlling air pollution. This was particularly emphasized by the estimate that the user’s operational impact on pollutant formation is larger than the state of the art of the stove technology itself. There was also an agreement on preparation of appropriate fuel quality and on secondary abatement technology such as electrostatic precipitators.

Slides and a transcript of the expert roundtable can be downloaded from the [Task 32 website](#).