



Wood burning – key problems and solution approaches

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Actual impact of wood burning is not visible

- 80-90% of particles below 1 μm
- Decision makers are focused on $\text{PM}_{10}/\text{PM}_{2.5}$ and transport
- Most monitoring stations are traffic-related
- Only particle mass is measured (type approval)

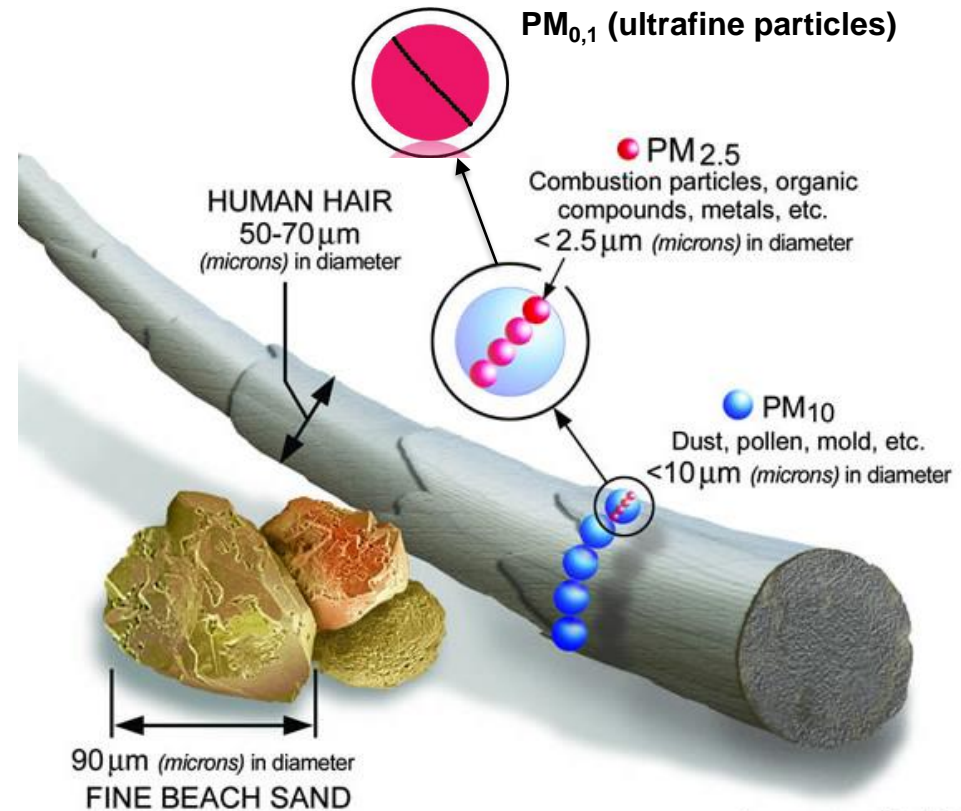


Image courtesy of the U.S. EPA

Wood burning is not climate-neutral

- Logwood stoves with considerable emissions of Black Carbon (BC) and also methane
- BC is a climate pollutant with a GWP-20 of 210-1500
- Conclusion: **„...results show that in the short term (i.e., 20-year period) CO₂-eq for all non-CO₂ forcers offset the CO₂ benefits of biomass use.“**

(Ozgen/Caserini (2018): Methane emissions from small residential wood combustion appliances, Atmospheric Environment, 189)



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Lack of coherence between policies for 2030

Reduce emissions:
National Emission
Ceilings Directive



Target for PM_{2,5}: - 49%



Member States: NAPCP

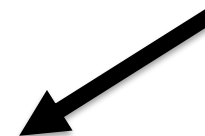
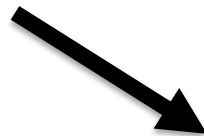
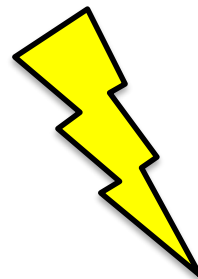
Promote renewables:
Renewable Energy
Directive II



Heating/cooling: 27%



Member States: NECP



Substantial amount of
renewable heat in MS is
based on wood

Cities: WHO AQG as minimum standard

- EEA: 374.000 premature deaths due to $PM_{2.5}$
- EU limit values for ambient air quality too weak!
- Commitment to WHO AQG by 35 cities of the C40 alliance: needs to be taken up!
- Ultrafine particles have be considered as well (-> source-specific standards)



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Emission reduction technology needs to become standard!

- Central question: Why do Diesel vehicles need to have a filter and stoves don't?
- Upcoming Ecodesign emission standards will not lead to low-emission stoves/boilers
- Stricter limit values for particle mass and particle number needed
- Stoves should have no prospects without filter/precipitator



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Technical solutions promoted by Clean Heat

- Pellet boiler retrofitted with precipitator
 - Result: 80% reduction of particle number
- Stoves: New eco-label for firewood stoves in Germany (Blue Angel)
 - More realistic measurement procedure
 - PN measurement and strict limit values
 - Automation to reduce operating errors
 - Stove and precipitator combined



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Thank you!

Patrick Huth, Deutsche Umwelthilfe (DUH), huth@duh.de

Website: www.clean-heat.eu/en / www.duh.de



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