



# BC from Residential Burning

---

Kaare Press-Kristensen  
Senior adviser, air quality  
The Danish Ecological Council  
(+45) 22 81 10 27  
[karp@env.dtu.dk](mailto:karp@env.dtu.dk)

# Winter in Copenhagen, DK





# Residential burning in EU

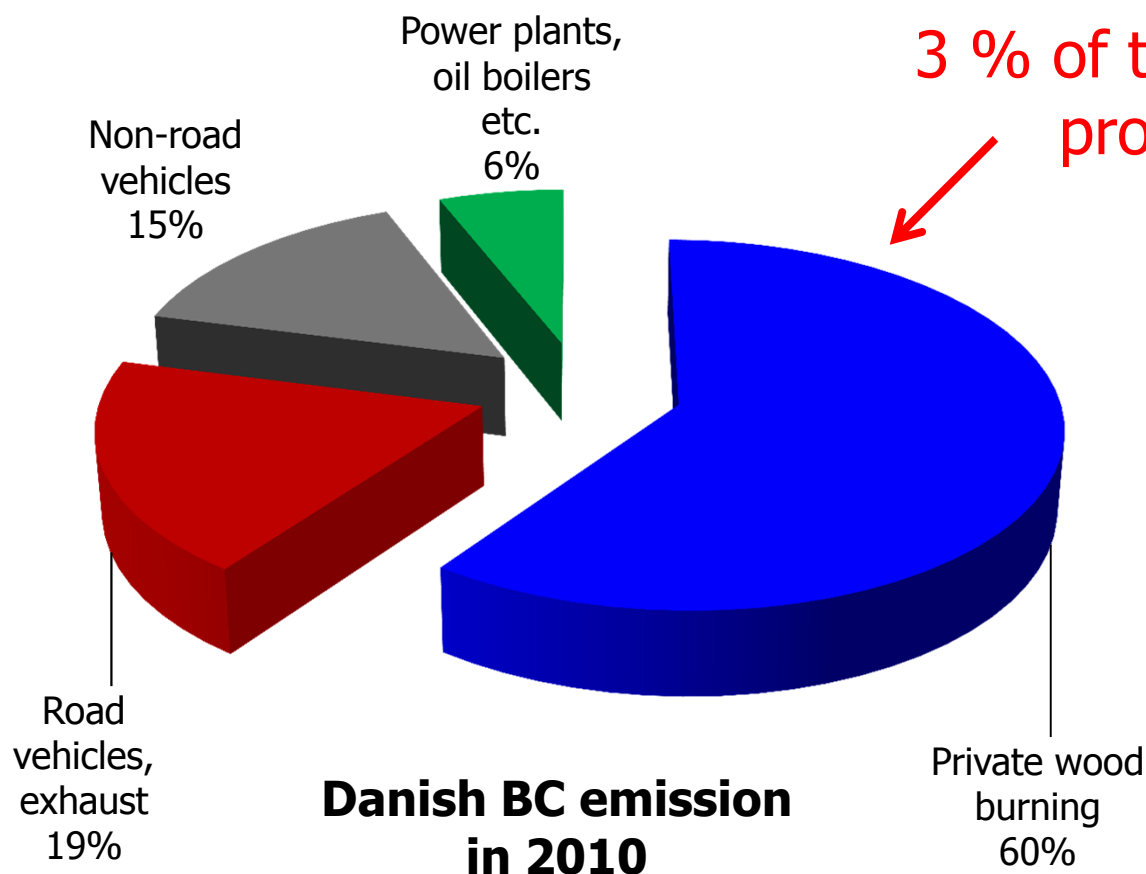
---

- About 45 % of the total PM<sub>2.5</sub> and BC emissions.
- Contribute significantly to premature mortality and morbidity as well as to climate change (BC).
- IIASA projection: 60 % of BC emissions in 2030.
- The key problem is intensive and increasing use of wood stoves combined with high emission factors and a very long unit lifetime (more than 40 years).

# IIASA projection for BC in EU



# Residential burning in DK

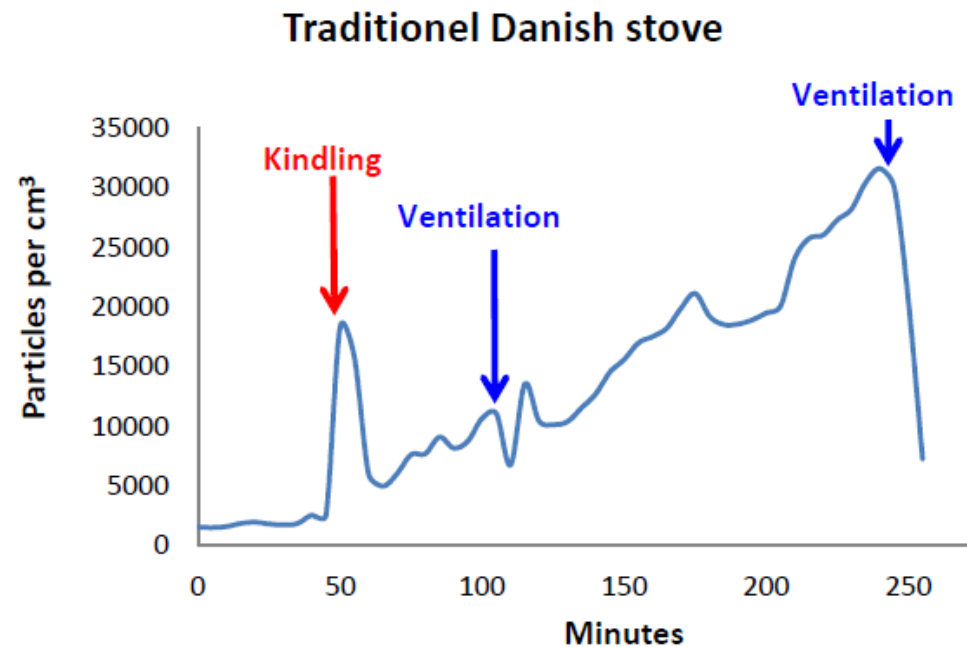


Covers only about  
3 % of the energy  
production

In 2030 private wood burning is expected to emit above 90 % of the Danish BC. All other sources are reduced - wood burning emits the same (less per unit but increased burning).

# Indoor measurements

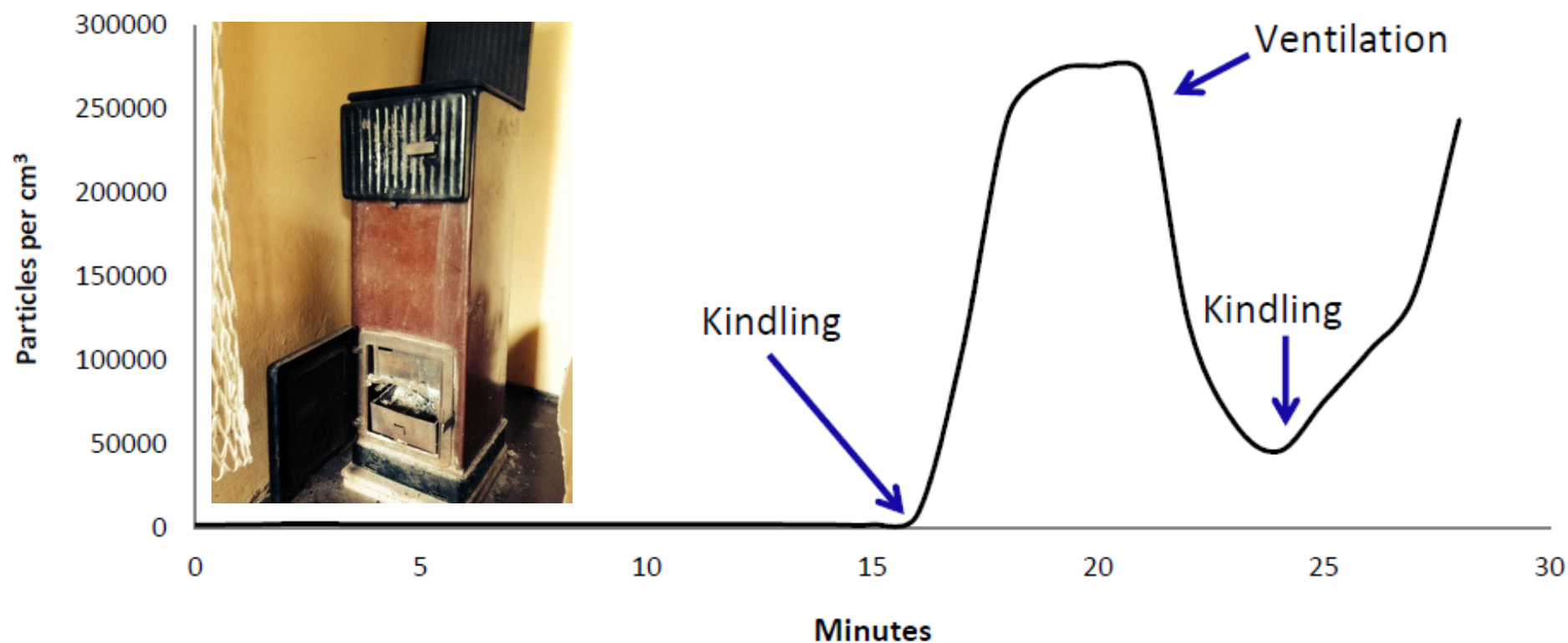
## Traditional stoves in DK



- Stoves can cause serious indoor air pollution and thereby exposure to soot particles (BC).

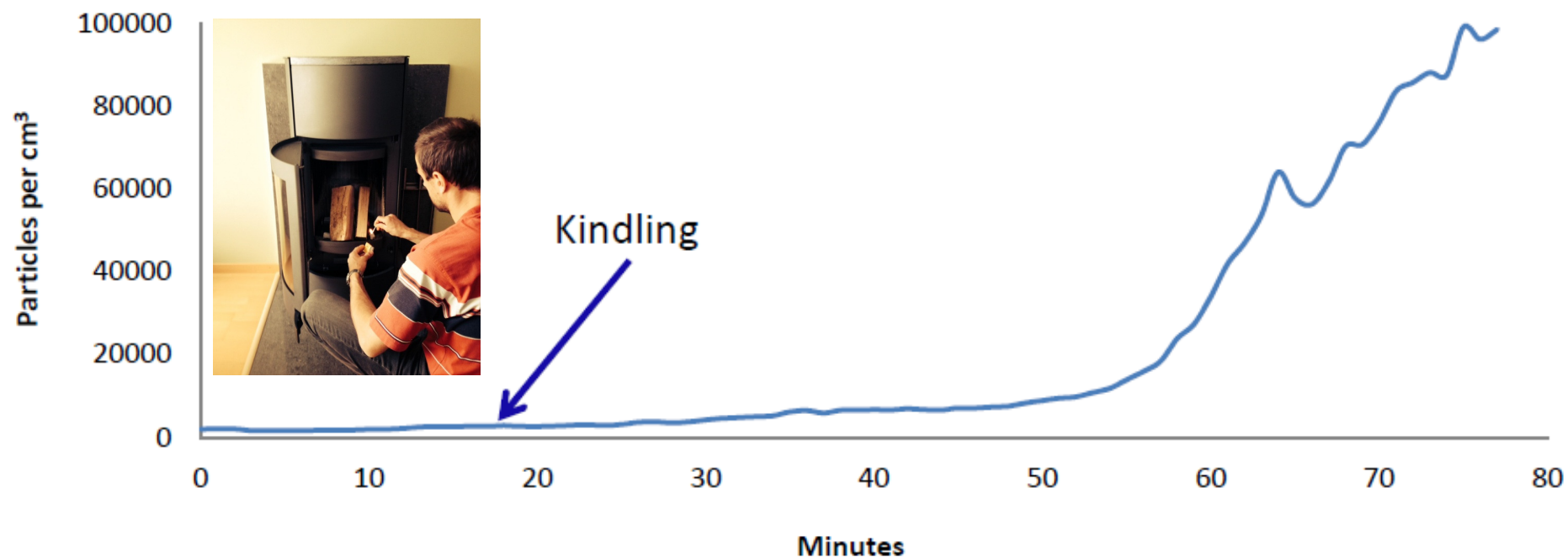
# Traditional stoves in Slovakia

Inside garden house: Wood burning in old stove



# New stoves in Slovakia

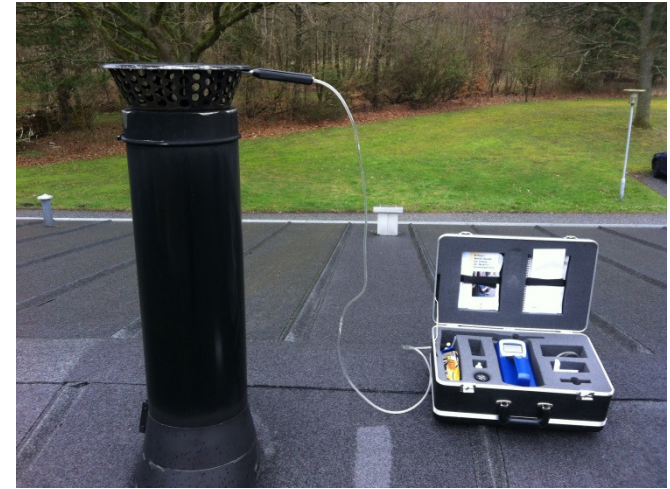
## Inside hotel room: Wood burning in new stove





# Outdoor measurements

## New stoves are not solutions



- Measurements are constantly above max. measuring limit - even from a brand new low-emission stove with completely dry small pieces of wood and plenty of air.

# New stoves vs. new trucks



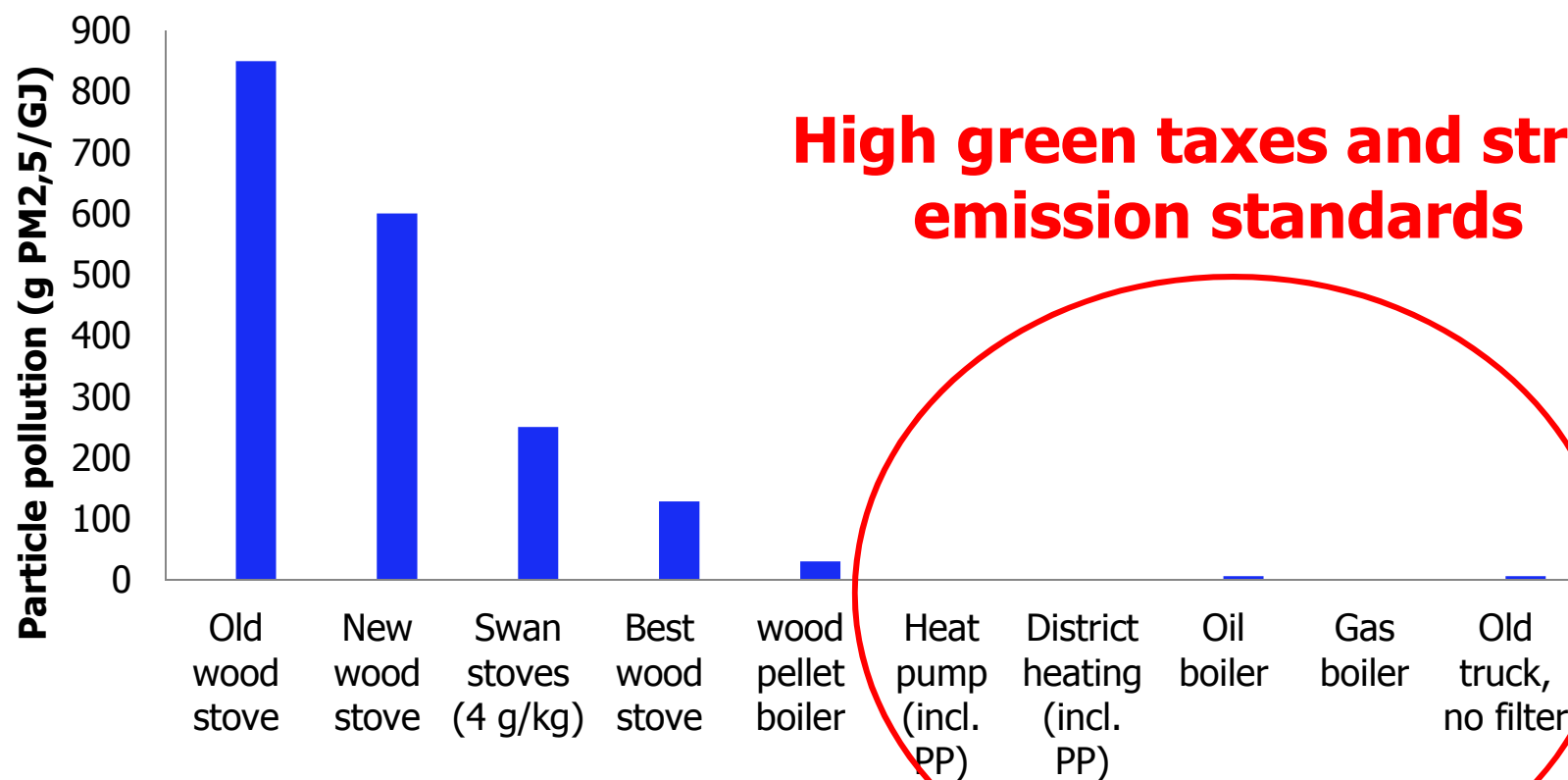
Top: Before stove measurements.  
Below: After 1 h measurements.



## Conclusion:

New low-emission stoves cause much higher emissions (above 500.000 part/cm<sup>3</sup>) than new trucks with particulate filters (below 1.000 part/cm<sup>3</sup>).

# The cause of the problem





# Technical solutions in the EU

---

- Better insulation
- Heat pumps
- District heating
- Wood pellet stoves/boilers
- New two-chamber stoves
- Gas stoves

**Reduction potential  
> 90 %**

(Air pollution control technology: Filters etc. ?)

**The solutions are ready – but not profitable !**

# What should be done in EU ?

- Strict emission limit values for new stoves/boilers.
- Strict PM<sub>2.5</sub> emission limits in the NEC Directive.
- Financial instruments to promote replacement.
- Financial instruments to promote alternatives.
- Laws to promote alternatives / ban in large cities.
- Information on health/climate issues – media !!!
- Information on stove management – campaigns !!!

# What are we doing ?

- Started a one-year European campaign focusing on BC from residential burning → Global perspective !!!

- **The basis of the campaign is:**



- 1) Knowledge sharing among NGOs: Web platforms with material about problems and solutions.
- 2) Expert team doing measurements, presentations and press work abroad to assist local NGOs.
- 3) Alliances with health organizations, authorities etc.



# Global perspective

---

- **China:** Residential burning of coal, wood etc. are the largest source to BC. Emissions from industry and transport will be reduced towards 2050. (*Environ. Sci. Technol.*, **2012**, 46 (14), pp 7595–7603)
- **India:** Residential burning of coal, wood etc. are the largest source to BC now and in the future. (*UNEP, 2012, ISBN 978-92-9029-529-7*)
- Appropriate knowledge from our European campaign must be shared on a global level. We are looking for NGOs (and money) to share knowledge on a global level ... and to continue our European campaign.



# Questions

