

## **FINE PARTICULATE MATTER EMISSIONS FROM RESIDENTIAL WOOD COMBUSTION AND REDUCTION POTENTIAL IN THE NORDIC COUNTRIES**

**N. Karvosenoja<sup>1</sup>, C. Sternhufvud<sup>2</sup>, K. Kindbom<sup>2</sup>, J.B. Illerup<sup>3</sup>, D. Jensen<sup>3</sup>,  
M. Johansson<sup>4</sup>, A. Lükewille<sup>5</sup>**

*<sup>1</sup>Finnish Environment Institute, Helsinki, Finland*

*<sup>2</sup>IVL Swedish Environmental Research Institute, Goteborg, Sweden*

*<sup>3</sup>National Environment Research Institute, Roskilde, Denmark*

*<sup>4</sup>UNECE, Palais Des Nations, Geneva, Switzerland*

*<sup>5</sup>Norwegian Institute for Air Research, Kjeller, Norway*

Residential wood combustion is relatively common in the Nordic countries, and it has been considered a potential way to reduce greenhouse gas emissions. However, other emissions, e.g. fine particulate matter (PM<sub>2.5</sub>), may be considerable. Current emission inventories comprise relatively coarse and simplified estimates for the residential sector. In this study, current heterogeneous PM<sub>2.5</sub> emission estimates from residential wood combustion in the Nordic countries were harmonised. Volumes of wood use and originally very different default emission factors specific to combustion technologies were reassessed for each country, and the total PM<sub>2.5</sub> emissions were calculated. Potential emission reduction measures were explored. A case study on the fuel switch from logs to pellets was carried out to quantify reduction potentials and their cost-effectiveness. The PM<sub>2.5</sub> emissions from the residential sector in 2000 in this study were 13, 8, 40 and 20 kton (52, 26, 69 and 42% of total PM<sub>2.5</sub> emissions) in Denmark, Finland, Norway and Sweden, respectively. Fuel switch to pellets was found to have a large emission reduction potential of 18 kton (PM<sub>2.5</sub>)/a in the Nordic countries, with a cost-efficiency of 3000-16000 euro/ton reduced PM<sub>2.5</sub>. This study founded a basis for a detailed and harmonised estimate of residential wood combustion emissions using all available measurement data from the Nordic countries. The improved emission estimates will be used to evaluate the background material in the expected revisions of air pollution agreements in Europe.