

Socio-Economic Analyses of Regulating Wood-Burning Stoves in Denmark

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People are daily exposed to air pollution. In the short term, it can lead to asthma and bronchitis and in the long run result in coronary heart disease, lung cancer, and ultimately premature death. The health effects entail significant economic costs, which with all likelihood constitutes the predominant share of the total costs of air pollution. Pollution from Danish wood-burning stoves is related to health costs of around DKK 4 billion per year only in Denmark and is characterized by limited regulation.

On this basis an analysis of the effects of different forms of regulation of air pollution from wood-burning stoves has been conducted. The net socioeconomic benefits of the following types of regulation are calculated:

- Differentiated taxes on the use of stoves, which reflect the derived health costs of using such stoves
- A ban on the use of older stoves
- Subsidies for scrapping older stoves

The size of the health costs of using a wood-burning stove depends heavily on the age of the stove and on where it is geographically placed. Thus, our calculations showed that the emissions associated with one hour use of an old wood-burning stove in Copenhagen have health-related costs of DKK 41 per hour of use while the health-related costs of the use of a new wood-burning stove also in Copenhagen is only DKK 7 per hour of use. If the same two stoves are placed on the Island of Bornholm the associated health-related costs are only DKK 5 or DKK 1 per hour of use.

Based on assumptions of different types of users, their distribution in Denmark and their demand for using wood-burning stoves we made a framework for calculating the loss of consumer surplus and the benefits of reducing air pollution from the stoves with the three different kinds of regulation.

Geographically differentiated taxes on the use of wood-burning stoves, reflecting the corresponding health costs, provides the greatest economic benefit among the analysed forms of regulation. The socioeconomic net benefit of this regulation is estimated to be about DKK 3 billion per year in Denmark. The calculations take into account the administrative costs of measuring the use of wood-burning stoves.