



Bron: <https://www.dsawsp.org/sources/wood-stove-changeouts>

Wood stove changeouts that replace older wood stoves with newer, certified ones are promoted by the wood burning industry as a harm reduction measure in wood smoke-impacted communities. But what's good for the industry isn't necessarily good for the rest of us.

A large and well-documented wood stove changeout took place in Libby, Montana from 2005–2008. The wood burning industry, US EPA and the state spent over \$2.5 million to replace most of the wood stoves in the Libby area with EPA-certified ones. They also invested in education programs and proper installation. Most participants in the changeout received a new wood stove, but a small number switched to a cleaner method of heating such as electric or propane. In the immediate years after the exchange, wood smoke-related particulate matter mass was reduced by 28%. However, there was also a general decline in all particulate matter during this time, including from cars and other sources. (On the whole, motor vehicles only made a small contribution to air pollution levels in Libby.)

“ Of the nine wood stoves that have cropped up in my area, the worst by far is the one next door, which belongs to a North Cowichan Wood Stove Exchange recipient. This neighbour's volume of smoke doubled and I thought he was having a chimney fire, when he relayed to me the good news that he had a brand new stove courtesy of North Cowichan!

Personal story submitted by J.L. in British Columbia.

80% of particle pollution before the changeout... and 81% after

Before the changeout, approximately 80% of Libby's wintertime PM_{2.5} pollution came from residential wood burning. After the changeout, approximately 81% of Libby's wintertime PM_{2.5} pollution (PDF) came from wood stoves. Ultimately, after an initial reduction, levels of toxic PAHs remained the same after the changeout as before.

Four years after the end of the exchange, there were "highly variable" levels of emissions across homes that had received new certified wood stoves. Some houses did not ultimately experience any reduction in PM_{2.5} at all.

Some types of wood stove emissions increased

Although some chemical compound amounts were lowered, emissions of elemental carbon did not decrease and levels of seven resin acids increased significantly, including dehydroabietic acid and abietic acid. Airborne potassium levels also rose significantly after the changeout.

In larger quantities, abietic acid is known to cause lung disease in workers who are exposed to pine resin. Dehydroabietic acid has also been shown to be cytotoxic to human epithelial and fibroblast cells and to cause neurological impairments in animal studies.

Airborne fine particulate potassium has been associated with lower infant birth weights.

If the subsidies had instead gone to install propane or electric heat for everyone, particulate pollution levels would have dropped almost 80 percent, while also reducing toxins and carcinogens.

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"The only interventions with good evidence for improving the air are those that reduce wood heater numbers.

Dr. Fay Johnston talking about strategies to reduce pollution from wood stoves, quoted by the Medical Journal of Australia, 2022.

No consistent effect and no clear reduction

In British Columbia, a study "did not find a consistent relationship between stove technology upgrades and indoor air quality improvements in homes where stoves were exchanged."

In addition, a report on BC's wood stove exchange program noted that, in spite of the popularity of the program, "there has not yet been a clear reduction in fine particulate matter (PDF) pollution coming from residential wood stoves."

Emitting as much as the old stoves

The area around Fairbanks, Alaska, is classified as being in “Serious Nonattainment” for PM_{2.5} due to residential wood burning in winter, despite the state having spent around \$12.5m in changeout grants to replace older wood stoves with newer ones in the community. The Alaska Department of Environmental Conservation (ADEC)’s commissioner discussed the changeout program in an op-ed in Fairbanks’ Daily News-Miner:

...based on local stakeholder input, we established a program to replace 25-year-old (or older) dirty stoves with what we thought were newer, cleaner burning stoves. Unfortunately, what we have found is that many of the stoves that were replaced were emitting as much, or more, than their predecessor.

A better solution: Change to a different form of heating

By comparison, the wood smoke-impacted city of Launceston, Australia, embarked on a campaign to move citizens away from wood heating.

During the 1990s, 66% of households in Launceston heated with wood, and the emissions from these wood heaters accounted for 85% of the community’s wintertime particulate air pollution.

An educational campaign was mounted, and electric heating was promoted as an affordable and non-polluting alternative. Throughout the 1990s, the number of homes that heated with wood declined, as the number that heated with electric rose.

From 2001–2004, the government ran the Launceston Wood Heater Replacement Program, by the end of which the number of homes heating with wood had dropped from 66% to 30% of all households. Many citizens who had not participated in the program decided to switch to electric on their own without a government subsidy.

Fewer wood stoves, fewer deaths

Wintertime PM₁₀ concentrations dropped from 43.6µg/m³ before the intervention to 27µg/m³ after. The male death rate was reduced by a “large and significant” amount for all causes, by 11.4%. Wintertime respiratory deaths were reduced by 28% for men and women combined. Similar reductions were not seen in the control city of Hobart.

Heat pumps are a better way to heat with electric

Air source heat pumps are increasing in availability and affordability, and are superseding piped natural gas as the most cost-effective heating in many cities.

Modern, efficient heat pumps are common in places with cold winters such as Sweden and Switzerland.