

Rebates for New Wood Stoves: Not an effective solution to pollution

According to the BC Lung Association's [website](#):

Since 2008, the BC Wood Stove Exchange Program has been in place to motivate BC homeowners to swap their old wood stoves with more efficient, cleaner burning models that will significantly reduce emissions in their communities.

The rationale for replacing older wood stoves with “more efficient, cleaner burning models” is that it will reduce emissions.

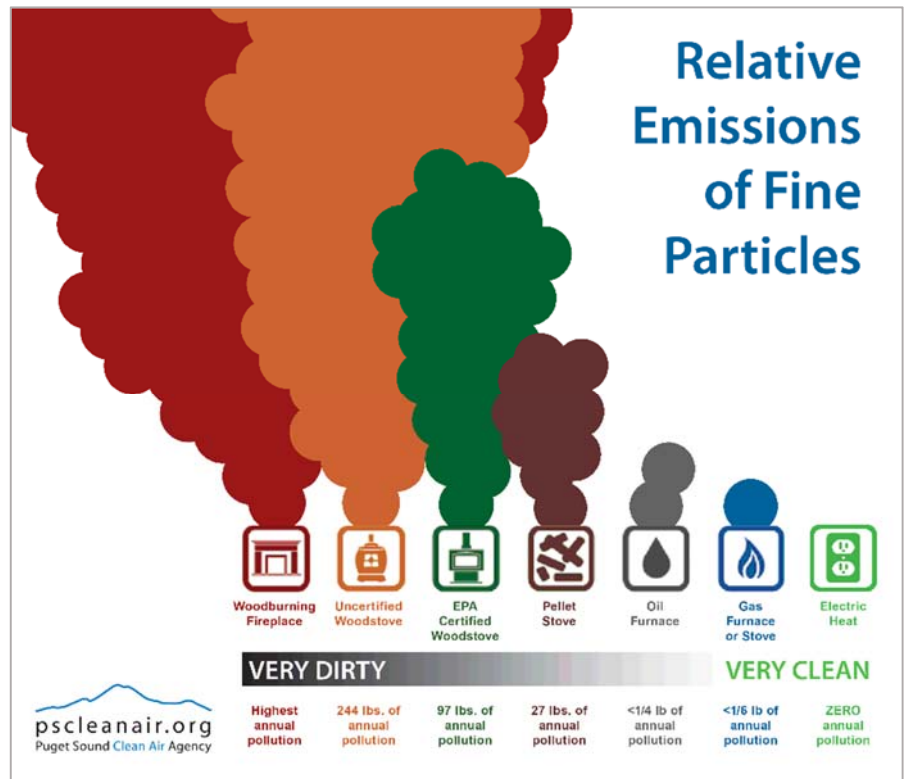
However, the [2015 evaluation](#) of six years of the wood stove exchange program found **“there has not yet been a clear reduction in fine particulate matter pollution coming from residential wood stoves.”** (p. i).

This is after \$2.2 million and over 6,000 stove exchanges (mostly for other wood stoves).

Failed changeout program

According to the Doctors & Scientists against Wood Smoke Pollution (<https://woodsmokepollution.org/wood-stove-changeouts.html>), prior to a city-wide, \$2.5 million, exchange program in the town of Libby, Montana approximately 80% of Libby's winter particulate pollution came from residential wood burning.

After the changeout, wood stoves still accounted for approximately 81% of Libby's particulate pollution, although there was a reduction in total PM2.5 mass. Ultimately, after an initial reduction, *levels of toxic PAHs remained the same after the changeout as*



before. And other toxins levels stayed the same or went up.

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 PM2.5 at all.

Most importantly, Libby still fails to meet EPA air quality standards.

As noted on their website:

“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.”

Industry’s own concerns with emission testing

Even the wood stove industry’s magazine, *Hearth & Home*, published an article (http://www.hearthandhome.com/magazine/2017-04-25/straight_talk.html) highly critical of wood stoves emissions testing and certifications. The author acknowledged that factory testing levels have little relation to emissions from in-home use:

"...measured efficiencies rather than default efficiencies can be put on the list of certified stoves, but since they were developed under optimized laboratory tests they have little relation to efficiencies under actual in-home use and have even a higher relative uncertainty than particulate emission values."

The article highlights that most stove use requires a cold start each day, during which the highest emissions occur, yet these start-up emissions are not factored in during testing and certification. The industry article also highlights that wood stoves degrade with time, so emissions worsen, and that the new standards will do little to effect real change:

"Further, stoves degrade with time due to gasket failures, metal warping, catalyst failure, etc., suggesting the earliest certified models are no longer producing emissions as low as when they were new. Bottom line is that the impact of the NSPS [the EPA standard] on

particulate emissions levels from residential wood heaters will be slow. Local burn restrictions, home occupant educational programs, and financial incentives may be more effective alone or used in concert with the NSPS to affect a real change in particle emissions from residential wood combustion." (emphasis added)

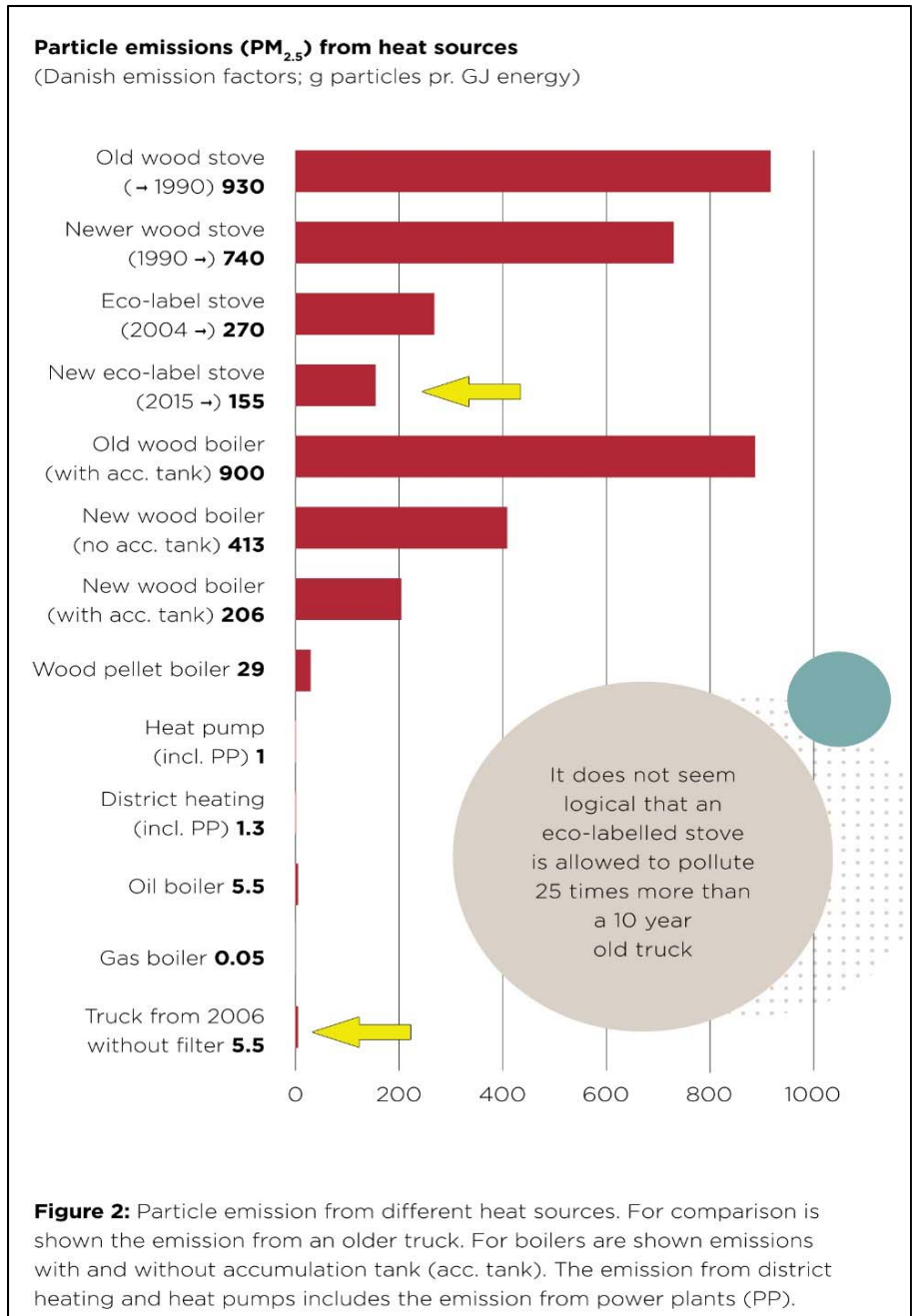


Figure 2: Particle emission from different heat sources. For comparison is shown the emission from an older truck. For boilers are shown emissions with and without accumulation tank (acc. tank). The emission from district heating and heat pumps includes the emission from power plants (PP).

Graphic from "Pollution from Residential Burning: Danish experience in an international perspective" on the [Clean Heat information page](#).

Is installing a new stove effective harm reduction?

The wood stove exchange program provides rebates for the removal of a highly polluting wood stove.

In a positive step, higher rebates are going to be provided for those who replace their old stoves with far cleaner gas heating or ductless heat pumps.

However, to date, the majority of the funding from this exchange program has supported the replacement of older wood stoves with newer, certified models. Rebates for these newer stoves continue to be available.

These newer models:

- still pollute *far* more than other source of heat, producing significant amounts of harmful second hand smoke, for both the homeowner and their neighbours.
- rely on the homeowners expertise and willingness to operate it as efficiently as possible and burn only legal materials; and
- would fail to meet any vehicle emission standards even when operated appropriately. For hours on end, they emit more fine particulate pollution than many idling pick-up trucks.

Additionally, the new appliance is likely to remain in use for a number of decades, exposing neighbours to more particulate pollution and other toxins than any other form of heat.

Financing new wood stoves is the lowest possible return on investment

From simply a financial perspective, the payback in reduced pollution per appliance is far higher for gas and heat pumps.

In fact, for a wood stove, there is no guarantee that emissions will be dramatically reduced.

Although newer regulations require lower emissions for new stoves, different [studies](#) have shown that real world operation of a wood stove *far* exceeds factory tested levels.

As a result, to try and help improve efficiency and reduce pollution, the wood stove exchange program must also invest further taxpayer dollars into operator education on how and what to burn. No such ongoing investment in education is required when a homeowner switches to gas or a heat pump.

The best way to *guarantee* a home will not have a wood smoke problem is to change it to a cleaner source of heat.

Is affordability of wood heat a good reason to allow continued burning?

The BC Lung Association advises people on its website to “not heat your home with wood unless no other fuel is available or affordable, but if you have to burn, burn smart”.

Affordability is a reason many give for using wood heat; however, for those who buy their wood, heat pumps and even gas offer reasonable cost alternatives.

Additionally, the solution to the economic challenges some wood stove users might face is *not* to just allow people to keep polluting our common air space.

The solution is to find policy approaches that will help ensure the costs of cleaner heating sources are reasonable and accessible to those in need, and will discourage use of polluting sources of heat.

Organizations like the BC Lung Association could focus on promoting policy changes that help ensure the costs of cleaner heating sources are reasonable, particularly for low income people, and polluting sources are discouraged through disincentives.

Analysis of providing rebates for wood stoves vs. non-wood burning appliances

Issue	Certified Wood Stove	Non-wood burning appliance
<p>Return on investment (i.e. how well does investment meet program goals of reducing pollution).</p>	<p>Dollar for dollar, taxpayer funded rebates will have the lowest impact on air quality. Even well-operated newer wood stoves will pollute far more than non-wood burning appliances, for decades.</p> <p>The efficiency of new wood stoves will also decrease over time (so they will release more pollution in the future).</p>	<p>Rebates for gas heat and heat pumps are higher than wood stove rebates so cost the taxpayer more.</p> <p>However, switching an old wood stove for a new non-wood burning appliances is <i>guaranteed</i> to eliminate air quality concerns from the home, for the short- and long-term.</p>
<p>Investment in Education</p>	<p>Having a newer stove is no guarantee emissions will be significantly lowered. Education on so-called ‘smart’ burning can help an operator learn how to lower their emissions, but there is no guarantee of improved results.</p> <p>Additionally, studies have shown when education drops off, emissions can go back up so <i>ongoing investment in education will be needed</i> for wood stove owners.</p>	<p>No need for investment in education (the installer will provide all that might be needed).</p>
<p>Compliance and Enforcement</p>	<p>There is no guarantee that EPA stove users will burn ‘smart’ or that they will not burn prohibited materials (unseasoned wood, garbage, painted wood, etc).</p> <p>For people who are not burning well, or burning illegal materials, enforcement tools and time will be needed to help reduce emissions.</p>	<p>No compliance issues except on installation (to meet building codes).</p> <p>No enforcement required.</p>
<p>Health impacts</p>	<p>There are a wide range of serious health impacts associated with fine particulates and other toxins found in wood smoke.</p> <p>The level of pollution emitted from each certified wood stove is highly dependent on the operator’s practices.</p> <p>However, even well-operated, newer wood stoves emit significantly more fine particulates than other forms of heat. They also release a number of known carcinogens and toxins.</p>	<p>Pollution levels are consistently negligible or non-existent. No health impacts.</p>