

BLUE RIDGE ENVIRONMENTAL DEFENSE LEAGUE

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Asphalt Plant versus Wood Stove Pollution

Comparing Apples and Hedgehogs

Asphalt plants and household wood stoves burn fuel to produce heat. Although they burn different types of fuel, both emit some of the same chemical compounds into the air as a result of the combustion process. But a household wood stove emits but a tiny fraction of the pollution emitted by an asphalt plant. This is why one expert said that this is like comparing apples to hedgehogs, because apples-to-oranges simply does not convey the huge disparity in pollution emitted by these two sources. The table below evaluates air pollution from a conventional household wood heater stove and an average size asphalt plant. In every category, the asphalt plant emits from hundreds to thousands or even millions of times more air pollution.

Air pollutant	Wood stove	Asphalt plant	Comparison %
	emissions lb/y	emissions lb/y	Wood to Asphalt
Carbon monoxide	249.70	39,000	0.64 %
Nitrogen oxides	3.02	16,500	0.02 %
PM-10	33.05	6,900	0.48 %
Sulfur dioxide	0.43	3,300	0.01 %
Total organic compounds	89.60	13,200	0.68 %
Methane	32.40	3,600	0.90 %
Benzene	2.09	117	1.79 %
Toluene	0.79	70	1.13 %
Polycyclic aromatic hydrocarbons	0.79	264	0.30 %
Cadmium	0.00002	1.26	0.0016 %
Chromium	<0.000001	7.2	0.000014 %
Nickel	0.000015	390	0.000004 %

Emission data from US Environmental Protection Agency Air Pollution Emission Factors
Hot Mix Asphalt Plants, AP-42, 11.1 3/04 at <http://www.epa.gov/ttn/chief/ap42/ch11/final/c11s01.pdf>
Residential Wood Stoves, AP-42, 1.10 10/96 at <http://www.epa.gov/ttn/chief/ap42/ch01/final/c01s10.pdf>

The US Environmental Protection Agency's most recently available air pollution emission factors for both wood stoves and asphalt plants were used to compile the data in this report.

The combustion of wood produces atmospheric emissions which are highly variable. For example, when wood is added to a wood-burning heater stove, emissions increase for a short period because of a high burn rate. Then a longer period at lower burn rate follows during which time charcoal is burned, resulting in reduced emissions. Many wood stoves manufactured after 1986 have pollution reduction features.

The manufacture of asphalt paving produces high levels of atmospheric emissions. Some of these pollutants are emitted through the smokestack after passing through a fabric filter, some

are released at ground level without any pollution controls. The ground-level emissions are poorly estimated by state and federal air quality guidance.

To calculate the annual pollution totals for this report, we compared a drum-mix asphalt plant burning number 2 fuel oil producing 300 thousand tons of asphalt per year with a residential wood stove burning three cords of oak wood per year.

The Carolina Asphalt Paving Association claims that ten residential wood stoves emit as much polycyclic aromatic hydrocarbons as an asphalt plant. (http://www.carolinaasphalt.org/about_research.asp). Plainly, this assertion is not supported by EPA data. In fact, an average sized asphalt plant can emit more PAH than 300 wood stoves, more sulfur dioxide than 7,000 wood stoves, and more cadmium than 63,000 wood stoves.

	Fireplace	Asphalt plant	Comparison %
Air pollutant	emissions lb/y	emissions lb/y	Wood to Asphalt
Volatile organic compounds (VOC)	247.30	9,600	2.6 %

Emission data from US Environmental Protection Agency Air Pollution Emission Factors Residential Fireplaces, AP-42, 1.9, 10/96 at <http://www.epa.gov/ttn/chief/ap42/ch11/final/c01s09.pdf>

Further, CAPA states that “during the course of a year, an asphalt plant gave off the VOCs of two residential fireplaces.” Again, the EPA emission factors tell a different story; a single medium sized asphalt plant produces as much VOC as 39 fireplaces burning three cords of oak. Other categories of pollutants emitted by fireplaces are similar to those of wood-burning stoves. Open fireplaces are inefficient sources of heat because combustion is poorly regulated. Uncontrolled air and a lack of secondary combustion results in relatively high quantities of unburnt compounds going up the chimney. Nevertheless, comparing the air pollution from a modern type asphalt plant with an old-fashioned fireplace is like comparing apples to hedgehogs.

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