

Source Category:	Residential Combustion - Fireplaces
SCC Code:	2104008001 Without Inserts
Pollutants of Concern:	PM-10, PM-2.5

How is the PM National Emission Inventory developed for this category?

Current Methodology (see also the link to the NEI Methodology Description):

- EPA determines the number of homes with fireplaces in the U.S. (*U.S. Department of Census (DOC) data*).
- EPA adjusts for the fact that some homes have more than one fireplace (multiply by 1.17).
- EPA accounts for the fact that not everybody burns wood (74% burn wood, 26% burn gas).
- EPA accounts for the fireplaces not being used (42% not used).
- EPA subtracts out the number of fireplaces with inserts (*DOC data*). (Note that fireplaces with inserts are treated like woodstoves).
- Fireplaces fall into 2 categories; those used for heating and those used for aesthetics (*DOC data*). EPA determines the amount of wood burned nationally for each purpose. Wood consumption rates assumed to be 0.656 cords burned /unit/year for fireplaces used for heating and 0.069 cords/unit/year for fireplaces used for aesthetics.
- EPA accounts for climate differences by allocating the total amount of wood burned into 5 climate zones. This allocation is based on information from the Department of Energy that indicates the relative amounts of wood burned in each climate zone.
- EPA then allocates wood consumption within each climate zone to individual counties.
- EPA designates each county as either urban or rural and adjusts urban and rural wood consumption to match American Housing Survey data (68% of wood burned in fireplaces is burned in urban counties). Note: if the Census data indicates that greater than 50 percent of the county's population is located in cities and towns, the county was considered urban. Less than 50 percent, rural.
- EPA adjusts the final allocation until the desired urban and rural split is achieved.
- EPA uses AP-42 factors (section 1.9) to determine emissions from fireplaces.

Current Variables/Assumptions Used:

- National statistics are used to determine the consumption rates (heating vs. aesthetic usage), number of fireplaces/home, fuel type (wood vs. gas), number of fireplaces not used, and fireplaces with and without inserts.

Uncertainties / Shortcomings of Current Methods:

- As mentioned in “Current Methodology”, consumption estimates are not distributed based on device type but on estimates of the usage (heating vs. aesthetics) and on population. Consumption rates for heating and aesthetic burning are assumed constant throughout the country.

How can State, Local, and Tribal agencies improve upon this methodology?

- Estimate the number of devices in existence, number of devices in use and the number of devices being used to burn wood at State or county level. (In NEI, device usage is national average and allocation to the county level for fireplaces without inserts depends entirely on the designation of a county as urban or rural. [*Housing survey, Consumer Product Safety Commission*])
- Characterize fireplaces as being used for primary heating devices, secondary heating devices, or aesthetic purposes (national values currently used). [*Housing survey, Consumer Product Safety Commission*]
- Characterize fuel type for fireplaces (wood vs. gas) and annual wood consumption for counties where fireplace use is substantial. [*Survey*]

Where can I find Additional Information and Guidance?

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AP-42, Section 1.9

<http://www.epa.gov/ttn/chief/ap42/ch01/final/c01s09.pdf>

Area Source Emissions Model

<http://www.epa.gov/ttn/chief/software/asem/index.html>

County Level Emission Density Maps for this Source Category	http://www.epa.gov/ttn/chief/eiip/pm25inventory/densitymaps.pdf
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EIIP Document on Residential Wood Combustion	http://www.epa.gov/ttn/chief/eiip/techreport/volume03/iii02_apr2001.pdf
NEI Methodology Description	ftp://ftp.epa.gov/EmisInventory/finalnei99ver2/criteria/nationaldata/area/ or http://www.epa.gov/ttn/chief/eidocs/sec5part1_reswood.pdf