

# Emissions Reductions Achieved from the Wood Stove Change-out Program

To calculate PM2.5 emission benefits from the Greenhouse Gas Reduction Fund (GGRF) Woodsmoke Reduction Program (WRP) changeout activities in Butte County, we followed the methodology described in Section 7.1 Residential Wood Combustion (RWC) of CARB's Emission Inventory updated in December 2025. CARB is in the process of publishing this new methodology document which will soon be available at the following link: [Area Source Methodologies by Major Category | California Air Resources Board](#).

Because the WRP collects information on both the old and the replacement devices, emission calculations were based on actual program-reported device types rather than the device fractions included in CARB's RWC methodology. Through the WRP, Butte County replaced 122 existing devices (including uncertified woodstoves/inserts and fireplaces) with lower-polluting home heating devices by December 31, 2022. By December 31, 2025, this number increased to 207. Table 1 lists the number of devices removed by type. Table 2 lists the number of newly installed devices by type.

Table 1: Number of devices removed by device type.

<b>Device Type</b>	<b>Number of Devices by 12/31/2022</b>	<b>Number of Devices by 12/31/2025</b>
Fireplace	17	55
Uncertified woodstove or insert	105	152

Table 2: Number of newly installed devices by device type.

<b>Device Type</b>	<b>Number of Devices by 12/31/2022</b>	<b>Number of Devices by 12/31/2025</b>
Certified catalytic wood stove or insert	58	94
Certified hybrid (catalytic/non-catalytic) wood stove or insert	NA*	6
Certified non-catalytic wood stove or insert	39	45
Certified pellet stove or insert	2	14
Electric heat pump, old fireplace retained	NA*	12
Electric heat pump, old wood stove or insert retained	NA*	9
Electric heating stove or insert	NA*	2
Electric heat pump, old device removed	NA*	2
Natural gas home heating device	20	20
Propane home heating device	3	3

\*These types of devices were not offered through the WRP before 2023.

All replacement devices, except those involving an electric heat pump with the old device retained, are assumed to be used for primary heating only based on the WRP program guidelines. For cases where an electric heat pump is installed but the old device is retained, the electric heat pump is assumed to serve as the primary heating while the retained old device is treated as supplemental heating. Emissions for electric, natural gas and propane heating devices are assumed to be zero. Because the program does not differentiate between uncertified wood stoves and fireplace inserts, they are treated the same in the emission calculations. Wood usage, burn rate ratios and PM<sub>2.5</sub> emission factors for each device type can be found in CARB’s RWC methodology.

After annual PM2.5 emission benefits are estimated, monthly benefits are calculated with the default temporal allocation factors. Summer and winter PM2.5 emission benefits are then determined by summing the appropriate months. The PM2.5 emission benefits from the WRP in Butte County are summarized in Table 3 and Table 4.

Table 3: PM2.5 emission benefits from all changeouts completed by 12/31/2022.

<b>Time Period</b>	<b>PM2.5 Emission Benefit</b>	<b>Unit</b>
Year	6.623	tons/year
Summer (May-Oct)	0.603	tons/summer
Winter (Nov-Apr)	6.020	tons/winter
Winter (Nov-Apr)	0.033	tons/day

Table 4: PM2.5 emission benefits from all changeouts completed by 12/31/2025.

<b>Time Period</b>	<b>PM2.5 Emission Benefit</b>	<b>Unit</b>
Year	10.792	tons/year
Summer (May-Oct)	0.982	tons/summer
Winter (Nov-Apr)	9.810	tons/winter
Winter (Nov-Apr)	0.054	tons/day

The emission reductions achieved from the WRP were subtracted from the residential wood combustion emission estimates as a line item prior to performing the rollback analysis.