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August 31, 2015

Mary Nichols, Chairperson
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Support for Inclusion of Wood Heating Device Change Out Program

Dear Chairperson Nichols,

The California Air Pollution Control Officers Association (CAPCOA) is in full support of a wood heating device change out program included in the Concept Paper for the Cap and Trade Auction Proceeds Second Investment Plan. This type of program would benefit residents throughout California, including rural and low income communities that rely on wood heating for a large percentage of their heating requirements, through a voluntary program that would replace inefficient and uncertified heating devices with certified devices. Changing an uncertified device to a certified device can provide quantifiable reductions of greenhouse gases and short-lived climate pollutants, as well as PM2.5, providing long term climate benefits and short term health benefits.

Use of Greenhouse Gas Reduction Fund for Wood Heating Device Change Out

For many parts of California, wood heating devices still provide either a primary source of home heating, or are used to supplement other types of home heating. Based on the 2013 American Community Survey published by the U.S. Census, there are approximately 217,000 residences in California (1.7% of total residences) that use wood heating as their *primary* source of home heating. In addition, there are 3.6 million residences (28% of total residences) that use either tank gas such as propane, or electricity as their primary source of heat due to lack of local infrastructure to support natural gas heating. Of these 3.6 million residences a portion will use wood heating as a supplemental form of heat depending on the cost and local availability of wood for heating. Looking at individual counties in California though, there is a large variation in the number of households relying on wood heating, with rural areas such as Plumas County relying on wood as the primary fuel for over 30% of the households, and urban counties generally under 0.5%. Urbanized counties can still have several thousand residences using wood as a primary or secondary source of heat that will tend to be in socioeconomically

disadvantaged areas that could benefit from change out programs. Attached is a map highlighting counties in California that rely heavily on wood heating as well as American Community Survey estimates of wood stove use for primary heat, by county.

Current Inventory of Uncertified Wood Heating Devices

In 2011, the Hearth, Patio and Barbecue Association estimated¹ that as of 2010, approximately 64% of residential wood stoves nationwide were non NSPS certified 20 years after new wood stoves were required to meet 1990 Phase II emission limits. Collectively these existing noncertified wood stoves were responsible for 86% of the emissions for all wood stoves.

In February 2015, USEPA updated its New Source Performance Standard (NSPS) for new residential wood heaters by phasing in emission limits over a five-year period beginning this year. Step 1 of the NSPS, effective now, sets emission limits of 4.5 grams per hour for catalytic and noncatalytic stoves, while Step 2 sets limits in 2020 at either 2.0 or 2.5 grams, depending on the test method. California follows the current federal guidelines for wood heating devices, but other states such as Washington have had success with requirements more stringent than the federal guidelines.

Potential Emission Reductions

The Sacramento Metro AQMD along with the California Air Resources Board and other local air districts have developed a series of emissions calculations showing emissions reductions associated with replacing older uncertified wood heating devices with either Phase II certified devices or with devices that utilize gas, pellets, or electricity². Selected tables of the document (attached) estimate the reduction in pounds per year per device based on the estimated usage in the Sacramento area of 1.5 cords of wood per year. Based on these calculations, it is believed that replacement of an uncertified wood stove with a new certified catalytic wood stove would result in an emissions reduction of 1.6 tons per year of CO₂e (based on a usage of 1.5 cords of wood per year), primarily from reductions in carbon dioxide, methane, and nitrous oxide. Additional emission reductions of 45 pounds per year of PM_{2.5} would also be realized, which includes reductions of black carbon. Greater reductions could be gained from replacing uncertified wood stoves and inserts with gas-fueled units, and uncertified inserts with electric devices. Slightly less emission reductions would occur by replacing uncertified stoves and inserts with pellet stoves. Greater emissions reductions would also be realized in households in colder climates such as Plumas County, where fuel usage has been estimated at over 4 cords per year per household.

Many air districts in California have wood stove change out programs that are administered as funds are available. These programs generally provide funding assistance to home owners that volunteer to upgrade uncertified home heating devices to new certified devices, with incentives that vary based on the types of old and new device. Most programs also include a component that allocates additional funding to lower income households that are least able to purchase new equipment, yet tend to rely the most on sources such as wood for their home heating needs. These existing air district programs already have procedures that solicit community interest, they work with individual households and local dealers to prescreen applicants and follow the course of a project through to completion with verified destruction of the old device.

¹ Houck, 2011, "The Fraction of Freestanding Wood-Fueled Stoves in Current Use That are U.S. EPA Certified Cordwood Stoves and Wood Pellet Stoves"

² Quinn, 2015, "RWC Changeout GHG & Criteria Emission Reduction Calculation"

Based on current air district programs offering between \$1,000 and \$3,000 in incentives for change outs, a statewide program that targeted rural, low income, and heavy wood users could make a significant, beneficial long term impact at the local level due to reductions in particulate matter, but also in carbon dioxide equivalents that affect everyone. As an example using the emission reduction calculations referenced above, every \$10 million in funding spent for change outs of uncertified wood stoves and their replacements with certified catalytic wood stoves could provide the following reductions:

	1.5 Cords per year throughput	3.0 Cords per year throughput
\$1,000 Incentive	10,000 Change outs 16,000 Tons/Year CO ₂ e 225 Tons/Year PM _{2.5}	10,000 Change outs 32,000 Tons/Year CO ₂ e 451 Tons/Year PM _{2.5}
\$3,000 Incentive	3,300 Change outs 5,333 Tons/Year CO ₂ e 75 Tons/Year PM _{2.5}	3,330 Change outs 10,666 Tons/Year CO ₂ e 150 Tons/Year PM _{2.5}

Program Administration

Under the wood heating device change out concept, CAPCOA and the local air districts could administer a program consisting of the following:

- Determine funding levels for individual air districts based on factors such as population, use of wood heating devices and amount of wood used for primary and secondary home heating, socioeconomic considerations, strength of existing wood heating/outdoor burning regulations and outreach programs, and the ability of an air district to manage a change out program.
- Receive funding from the Greenhouse Gas Reduction Fund and provide funding to individual air districts.
- Analyze opportunities, if feasible, to limit incentives to heating devices meeting Washington State or US EPA 2020 New Source Performance Standards.
- Review district policies and procedures for change out program implementation. Assist districts without wood stove change out programs in developing policies and procedures, including incentive amounts for different categories of change outs.
- Track individual district progress in expending funds, the types of projects funded, the amount of funding provided to low income or environmental justice communities and estimated emission reductions. Aggregate data into one report.

CAPCOA appreciates the inclusion of a wood heating device change out program for consideration in the upcoming Second Investment Plan and we look forward to working with the Air Resources Board to further develop a statewide program for wood heating device replacements to help California meet its climate and public health goals. If you have any questions, please contact Alan Abbs, Executive Director, at 916-441-5700.

Sincerely,



Richard A. Stedman
President

Annual GHG Reductions From Each Type of Change Out

Changeout Type	Change-out Type (OLD to NEW)		GHG Emission Rate, pounds/yr_unit									
			Direct						Indirect CO2e		Total CO2e ¹	
	OLD	NEW	CO2		CH4		N2O		OLD	NEW	OLD	NEW
Fireplace to gas log	Fireplace	Gas Log	1397	566	5.57	0.01	0.05	0.00	46	84	1599	650
Fireplace to gas insert	Fireplace	Gas Insert	1397	539	5.57	0.01	0.05	0.00	46	80	1599	620
Fireplace to pellet	Fireplace	Pellet Stove	1397	7229	5.57	0.48	0.05	0.28	46	1147	1599	8471
Fireplace to non-catalytic wood insert	Fireplace	Certified Non-Catalytic Wood Insert	1397	5845	5.57	25.87	0.05	0.22	46	194	1599	6753
Fireplace to catalytic wood insert	Fireplace	Certified Catalytic Wood Insert	1397	5845	5.57	18.76	0.05	0.22	46	194	1599	6575
Fireplace to electric	Fireplace	Electric Fireplace	1397	0	5.57	0	0.05	0	46	57	1599	57
Uncertified wood insert to certified non-catalytic wood insert	Uncertified Wood Insert	Certified Non-Catalytic Wood Insert	7348	5845	60.98	25.87	0.28	0.22	244	194	9201	6753
Uncertified wood insert to gas insert	Uncertified Wood Insert	Gas Insert	7348	539	60.98	0.01	0.28	0.00	244	80	9201	620
Uncertified wood insert to gas log	Uncertified Wood Insert	Gas Log	7348	566	60.98	0.01	0.28	0.00	244	84	9201	650
Uncertified wood insert to pellet	Uncertified Wood Insert	Pellet Stove	7348	7229	60.98	0.48	0.28	0.28	244	1147	9201	8471
Uncertified wood insert to electric	Uncertified Wood Insert	Electric Fireplace	7348	0	60.98	0	0.28	0	244	57	9201	57
Uncertified wood stove to certified catalytic wood stove	Uncertified Woodstove	Certified Catalytic Wood Stove	9018	7181	74.84	23.04	0.35	0.28	300	239	11292	8078
Uncertified wood stove to certified non-catalytic wood stove	Uncertified Woodstove	Certified Non-Catalytic Wood Stove	9018	7181	74.84	31.79	0.35	0.28	300	239	11292	8297
Uncertified wood stove to gas stove	Uncertified Woodstove	Gas Stove	9018	3673	74.84	0.07	0.35	0.01	300	545	11292	4222
Uncertified wood stove to pellet	Uncertified Woodstove	Pellet Stove	9018	7229	74.84	0.48	0.35	0.28	300	1147	11292	8471
Certified non-catalytic wood insert to gas log	Certified Non-Catalytic Wood Insert	Gas Log	5845	566	25.87	0.01	0.22	0.00	194	84	6753	650
Certified non-catalytic wood stove to gas insert	Certified Non-Catalytic Wood Stove	Gas Insert	7181	539	31.79	0.01	0.28	0.00	239	80	8297	620
Pellet to gas	Pellet Stove	Gas Stove	7229	3673	0.48	0.07	0.28	0.01	1147	545	8471	4222
Removal of uncertified wood stove	Uncertified Woodstove	None	9018	0	74.84	0	0.35	0	300	0	11292	0
Removal of uncertified wood insert	Uncertified Wood Insert	None	7348	0	60.98	0	0.28	0	244	0	9201	0
Removal of pellet stove	Pellet Stove	None	7229	0	0.48	0	0.28	0	1147	0	8471	0

¹CO2e = CO2+25*CH4+298*N2O+Indirect CO2e, where direct is from combustion in the fireplace/insert/stove and indirect is from production and transportation of the fuel used.

Annual Criteria Pollutant Reductions From each type of Change Out

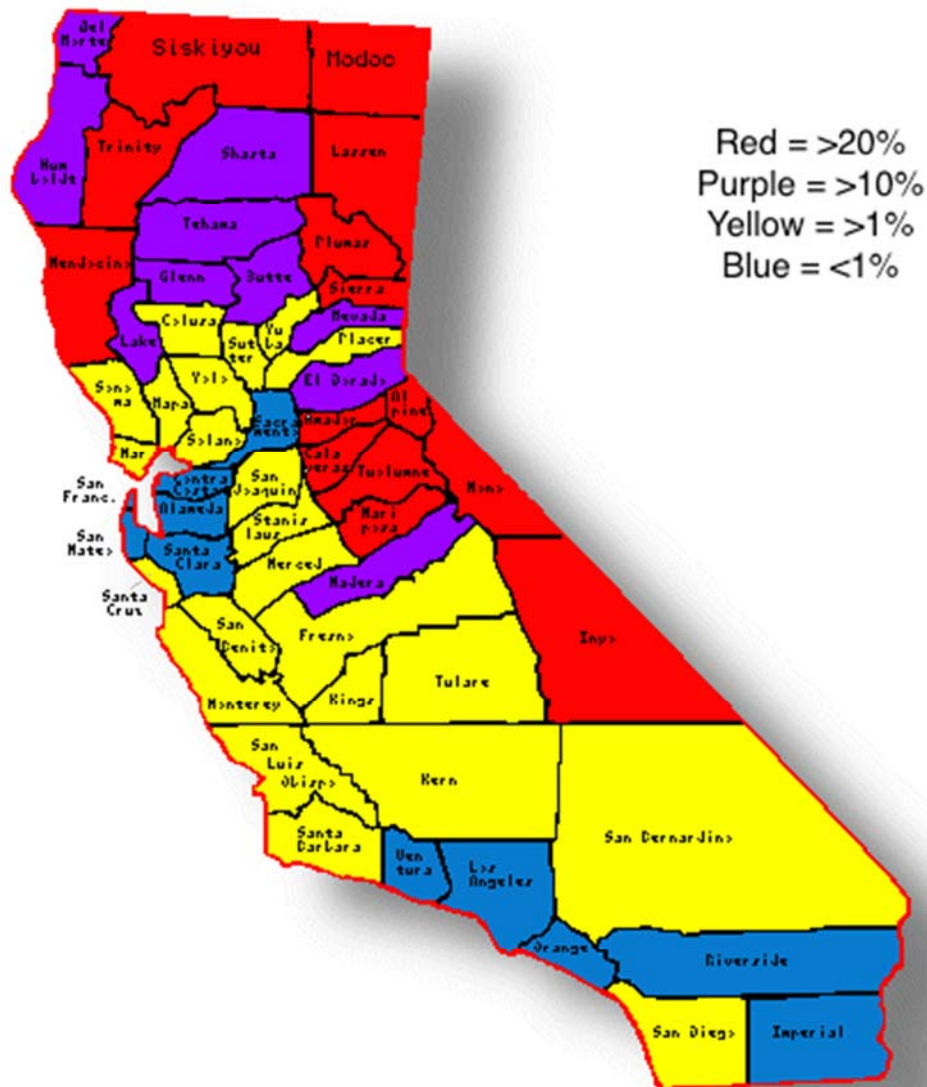
Changeout Type	Change-out Type (OLD to NEW)		Criteria Emission Rate, pounds/yr_unit													
			PM10		PM2.5		NOX		VOC		CO		SOX		NH3	
	OLD	NEW	OLD	NEW	OLD	NEW	OLD	NEW	OLD	NEW	OLD	NEW	OLD	NEW	OLD	NEW
Fireplace to gas log	Fireplace	Gas Log	9.12	0.04	8.77	0.04	1.00	0.45	7	0.03	58	0.19	0.15	0.00	0.70	--
Fireplace to gas insert	Fireplace	Gas Insert	9.12	0.04	8.77	0.04	1.00	0.43	7	0.03	58	0.18	0.15	0.00	0.70	--
Fireplace to pellet	Fireplace	Pellet Stove	9.12	6.12	8.77	5.80	1.00	7.60	7	0.08	58	31.80	0.15	0.64	0.70	0.60
Fireplace to non-catalytic wood insert	Fireplace	Certified Non-Catalytic Wood Insert	9.12	23.61	8.77	22.80	1.00	3.69	7	19.40	58	227.67	0.15	0.65	0.70	1.46
Fireplace to catalytic wood insert	Fireplace	Certified Catalytic Wood Insert	9.12	32.99	8.77	31.69	1.00	3.23	7	24.26	58	168.81	0.15	0.65	0.70	1.46
Fireplace to electric	Fireplace	Electric Fireplace	9.12	0	8.77	0	1.00	0	7	0	58	0	0.15	0	0.70	0
Uncertified wood insert to certified non-catalytic wood insert	Uncertified Wood Insert	Certified Non-Catalytic Wood Insert	62.20	23.61	59.97	22.80	5.69	3.69	108	19.40	469	227.67	0.81	0.65	3.46	1.46
Uncertified wood insert to gas insert	Uncertified Wood Insert	Gas Insert	62.20	0.04	59.97	0.04	5.69	0.43	108	0.03	469	0.18	0.81	0.00	3.46	--
Uncertified wood insert to gas log	Uncertified Wood Insert	Gas Log	62.20	0.04	59.97	0.04	5.69	0.45	108	0.03	469	0.19	0.81	0.00	3.46	--
Uncertified wood insert to pellet	Uncertified Wood Insert	Pellet Stove	62.20	6.12	59.97	5.80	5.69	7.60	108	0.08	469	31.80	0.81	0.64	3.46	0.60
Uncertified wood insert to electric	Uncertified Wood Insert	Electric Fireplace	62.20	0	59.97	0	5.69	0	108	0	469	0	0.81	0	3.46	0
Uncertified wood stove to certified catalytic wood stove	Uncertified Woodstove	Certified Catalytic Wood Stove	76.34	40.53	73.60	38.94	6.99	3.97	132	29.80	576	207.40	1.00	0.79	4.24	1.79
Uncertified wood stove to certified non-catalytic wood stove	Uncertified Woodstove	Certified Non-Catalytic Wood Stove	76.34	29.00	73.60	28.01	6.99	4.53	132	23.84	576	279.71	1.00	0.79	4.24	1.79
Uncertified wood stove to gas stove	Uncertified Woodstove	Gas Stove	76.34	0.24	73.60	0.24	6.99	2.95	132	0.17	576	1.26	1.00	0.02	4.24	--
Uncertified wood stove to pellet	Uncertified Woodstove	Pellet Stove	76.34	6.12	73.60	5.80	6.99	7.60	132	0.08	576	31.80	1.00	0.64	4.24	0.60
Certified non-catalytic wood insert to gas log	Certified Non-Catalytic Wood Insert	Gas Log	23.61	0.04	22.80	0.04	3.69	0.45	19	0.03	228	0.19	0.65	0.00	1.46	--
Certified non-catalytic wood stove to gas insert	Certified Non-Catalytic Wood Stove	Gas Insert	29.00	0.04	28.01	0.04	4.53	0.43	24	0.03	280	0.18	0.79	0.00	1.79	--
Pellet to gas	Pellet Stove	Gas Stove	6.12	0.24	5.80	0.24	7.60	2.95	0	0.17	32	1.26	0.64	0.02	0.60	--
Removal of uncertified wood stove	Uncertified Woodstove	None	76.34	0	73.60	0	6.99	0	132	0	576	0	1.00	0	4.24	0
Removal of uncertified wood insert	Uncertified Wood Insert	None	62.20	0	59.97	0	5.69	0	108	0	469	0	0.81	0	3.46	0
Removal of uncertified wood stove	Pellet Stove	None	6.12	0	5.80	0	7.60	0	0	0	32	0	0.64	0	0.60	0

Use of Wood Heating Devices as Primary Heating Source, by County

County	Number of Residences in County Using Wood as Primary Heat Source	Total Residences in County	Percentage of Total Residences in County Using Wood as Primary Heat Source
Alpine	162	394	41.12%
Modoc	1,637	3,983	41.10%
Trinity	2,190	5,668	38.64%
Sierra	445	1,253	35.51%
Plumas	3,106	8,997	34.52%
Siskiyou	6,300	19,417	32.45%
Lassen	3,120	9,945	31.37%
Mariposa	2,143	7,238	29.61%
Mono	1,505	5,268	28.57%
Calaveras	4,696	18,702	25.11%
Tuolumne	5,239	22,025	23.79%
Inyo	1,808	7,873	22.96%
Amador	3,191	14,262	22.37%
Mendocino	6,888	33,878	20.33%
Tehama	4,536	23,374	19.41%
Humboldt	9,504	53,296	17.83%
Del Norte	1,622	9,593	16.91%
Nevada	6,547	40,991	15.97%
Glenn	1,537	9,628	15.96%
El Dorado	9,905	67,885	14.59%
Shasta	9,364	68,980	13.57%
Lake	3,238	26,505	12.22%
Butte	9,868	84,816	11.63%
Madera	4,849	42,516	11.41%
Yuba	2,194	24,300	9.03%
San Benito	1,142	16,995	6.72%
Santa Cruz	5,305	93,504	5.67%
Colusa	388	6,853	5.66%
Placer	6,169	132,709	4.65%
Sonoma	8,006	185,660	4.31%
Napa	1,635	49,431	3.31%
Sutter	1,003	31,725	3.16%
San Luis Obispo	3,167	102,154	3.10%
San Bernardino	12,924	603,879	2.14%
Monterey	2,680	125,428	2.14%
Merced	1,601	75,409	2.12%
Kern	4,842	255,271	1.90%
Marin	1,917	102,912	1.86%
Stanislaus	3,066	166,883	1.84%
Yolo	1,290	70,347	1.83%
Fresno	5,247	289,811	1.81%
Tulare	2,350	131,642	1.79%
Solano	2,054	141,464	1.45%
San Joaquin	3,109	215,563	1.44%
Santa Barbara	1,653	141,720	1.17%
San Diego	11,943	1,076,483	1.11%
Kings	442	40,785	1.08%
Riverside	4,910	683,144	0.72%
Contra Costa	2,613	375,855	0.70%
Sacramento	3,292	517,243	0.64%
Ventura	1,654	267,076	0.62%
San Mateo	1,486	257,941	0.58%
Alameda	2,464	545,071	0.45%
Imperial	204	48,099	0.42%
Santa Clara	2,339	609,377	0.38%
Los Angeles	7,838	3,230,383	0.24%
Orange	2,385	995,512	0.24%
San Francisco	423	345,344	0.12%

	>20%
	>10%
	>1%
	<1%

Counties with Highest Usage of Wood Heating Devices for Primary Heat



Source: diymaps.net (c)