

Kickapoo Valley Solid Biofuel and Wood Product Feasibility Study

SPONSORED BY: MISSISSIPPI RIVER REGIONAL PLANNING COMMISSION VILLAGE OF LA FARGE, WISCONSIN

SEH NO. MRRPC 124002

January 2014

This study was authored by Short Elliott Hendrickson Inc. and Renewable Resource Solutions, LLC through grant awards to the Mississippi River Regional Planning Commission and the Village of La Farge from the U.S. Department of Commerce – Economic Development Administration and the Wisconsin Department of Administration. The statements, findings, conclusions, and recommendations are those of the authors and do not necessarily reflect the views of the grantors or grantees.





Building a Better World for All of Us® Engineers | Architects | Planners | Scientists "A society grows great when old men plant trees whose shade they know they shall never sit in."

Greek Proverb

Appendix A

Primary and Secondary Wood Processors in Region

Key #	Firm	City	County	User Types	User Types 2	User Types 3
1	3-D Entreprises	Sparta	Monroe	Specialty Products Producers		
2	Agwoods Inc	Richland Center	Richland	Specialty Products Producers		
3	Cook Creek Sawmill	Norwalk	Vernon	Sawmills		
4	David Troyer	La Farge	Vernon	Sawmills		
5	Eli Yoder	Westby	Vernon	Sawmills		
6	Emanuel P Miller	La Farge	Vernon	Sawmills		
7	Ervin Miller	Chaseburg	Vernon	Sawmills		
9	Jacob Schrock	Westby	Vernon	Sawmills		
10	John's Welding	Tomah	Monroe	Biomass/ Residue Producers		
11	Jere Hege	La Farge	Vernon	Sawmills		
12	Lamb Hardwood Lumber Inc.	Ontario	Vernon	Dimension, Flooring & Millwork Producers		
13	Macdonald & Owen Lumber Company	Sparta	Monroe	Dimension, Flooring & Millwork Producers		
14	Nelson Hardwood Lumber Co (Prairie Du Chien)	Prairie Du Chien	Crawford	Sawmills		
15	Pine River Woodcraft	Richland Center	Richland	Cabinets & Furniture Producers		
16	Richland Patterns, Inc.	Richland Center	Richland	Specialty Products Producers		
17	Riverside Sawmill, Inc.	Muscoda	Richland	Sawmills		
18	Rockbridge Sawmill Inc	Richland Ctr	Richland	Sawmills		
19	Ron Larson Sawmill	Cashton	Monroe	Sawmills		
20	Schroer Hardwood Lumber Co, Inc.	La Farge	Vernon	Sawmills		
21	Universal Forest Products, Inc. (Warrens)	Warrens	Monroe	Dimension, Flooring & Millwork Producers	Pallet & Container Producers	
22	Westby Hardwood Products	Westby	Vernon	Dimension, Flooring & Millwork Producers		
23	White City Lumber Inc	Hillsboro	Vernon	Sawmills		
24	Whole Trees Architecture & Structures	Stoddard	Vernon	Building Product Producers		

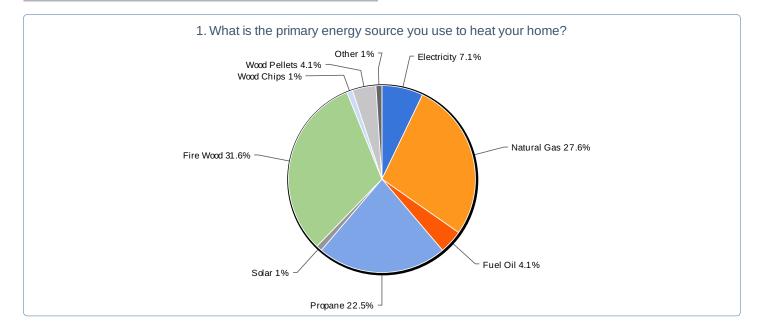
Source: Wisconsin's Wood Using Industry Database (WWUID)

Appendix B

Summary Report - Kickapoo Valley Solid Biofuel and Wood Product Market Survey

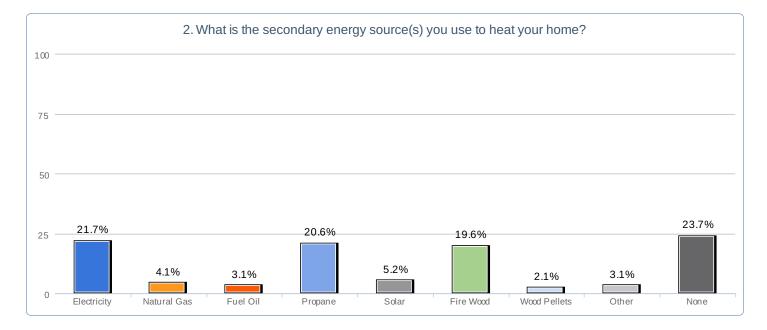
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Summary Report - Dec 2, 2013 Survey: Kickapoo Valley Solid Biofuel and Wood Product Market Survey



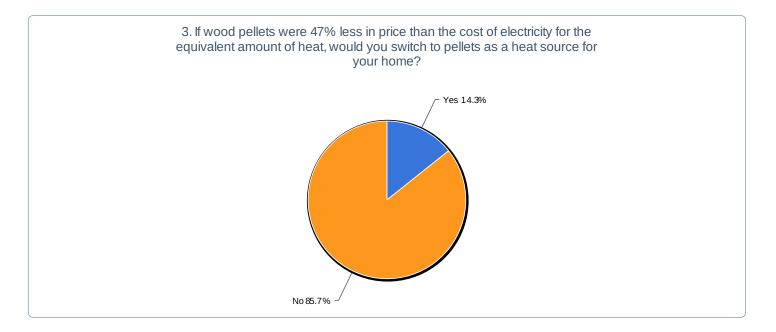
1. What is the primary energy source you use to heat your home?

Value	Count	Percent %	Statistics
Electricity	7	7.1%	Total Responses 98
Natural Gas	27	27.6%	
Fuel Oil	4	4.1%	
Propane	22	22.5%	
Solar	1	1.0%	
Fire Wood	31	31.6%	
Wood Chips	1	1.0%	
Wood Pellets	4	4.1%	
Other	1	1.0%	
Open-Text Response Breakdown for "Other"			Count
geothermal			1



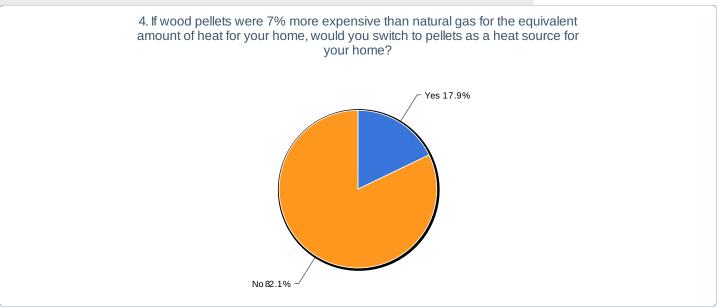
2. What is the secondary energy source(s) you use to heat your home?

Value	Count	Percent %	Statistics
Electricity	21	21.7%	Total Responses 97
Natural Gas	4	4.1%	
Fuel Oil	3	3.1%	
Propane	20	20.6%	
Solar	5	5.2%	
Fire Wood	19	19.6%	
Wood Chips	0	0.0%	
Wood Pellets	2	2.1%	
Other	3	3.1%	
None	23	23.7%	
Open-Text Response Breakdown for "Other"			Count
Left Blank			103
Geothermal			1
Passive solar			1



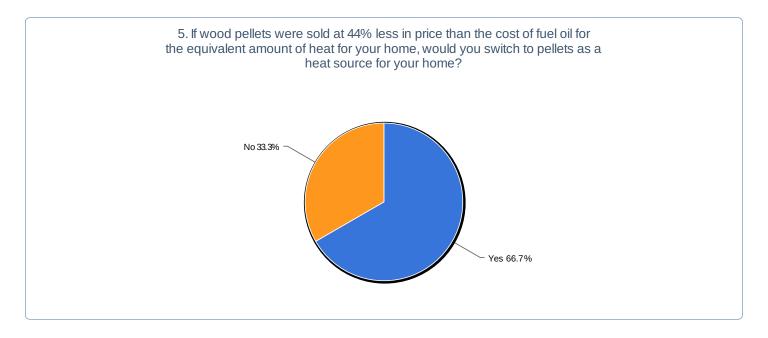
3. If wood pellets were 47% less in price than the cost of electricity for the equivalent amount of heat, would you switch to pellets as a heat source for your home?

Value	Count	Percent %	Statistics	
Yes	1	14.3%	Total Responses	7
No	6	85.7%		



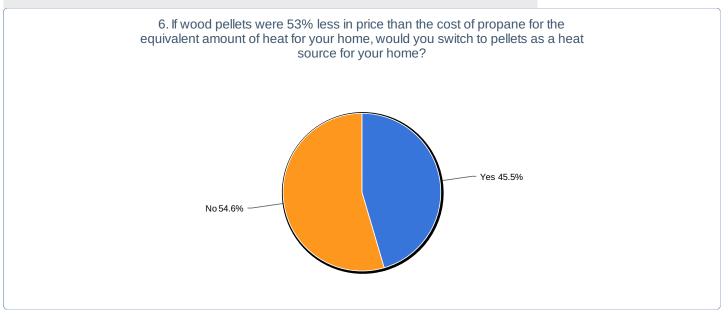
4. If wood pellets were 7% more expensive than natural gas for the equivalent amount of heat for your home, would you switch to pellets as a heat source for your home?

Value	Count	Percent %	Statistics	
Yes	5	17.9%	Total Responses	28
No	23	82.1%		



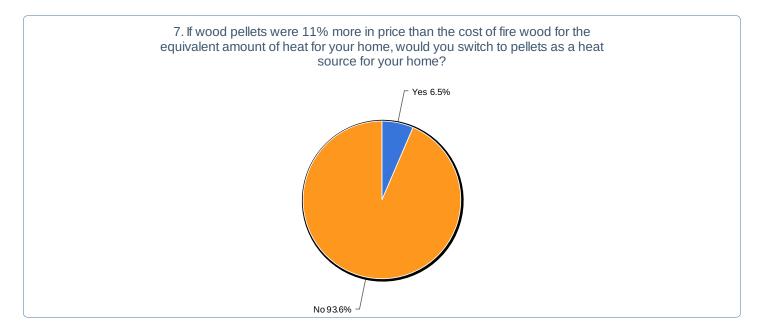
5. If wood pellets were sold at 44% less in price than the cost of fuel oil for the equivalent amount of heat for your home, would you switch to pellets as a heat source for your home?

Value	Count	Percent %	Statistics	
Yes	2	66.7%	Total Responses	3
No	1	33.3%		

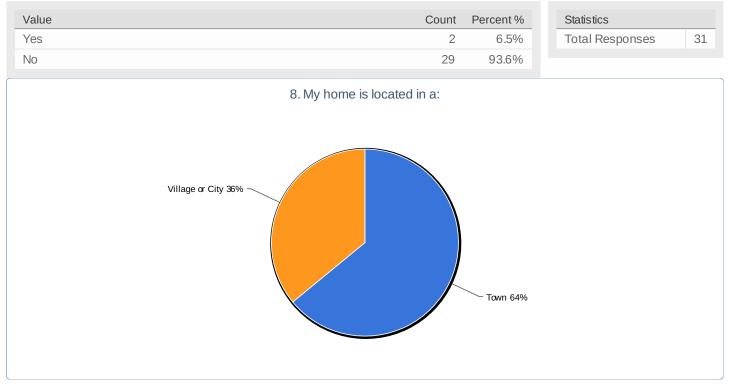


6. If wood pellets were 53% less in price than the cost of propane for the equivalent amount of heat for your home, would you switch to pellets as a heat source for your home?

Value	Count	Percent %	Statistics	
Yes	10	45.5%	Total Responses	22
No	12	54.6%		

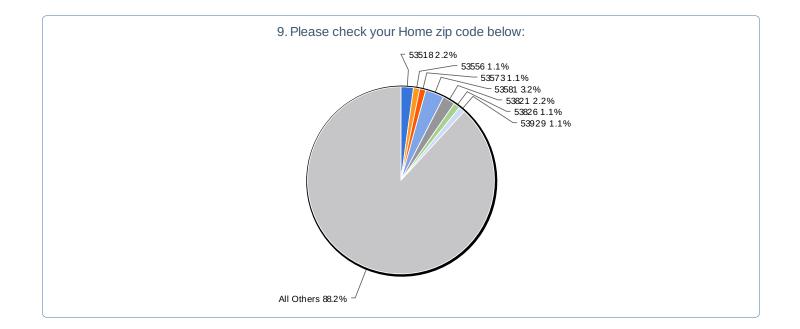


7. If wood pellets were 11% more in price than the cost of fire wood for the equivalent amount of heat for your home, would you switch to pellets as a heat source for your home?



8. My home is located in a:

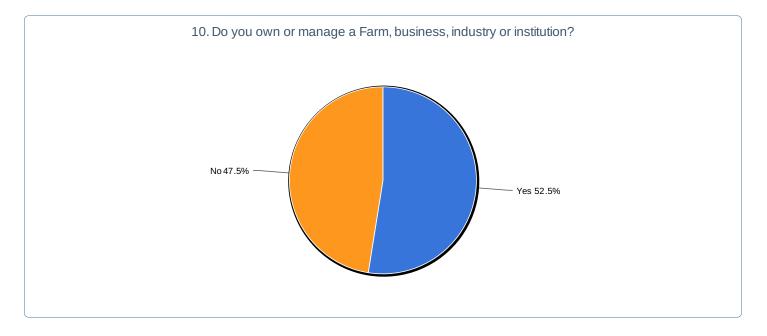
Value	Count	Percent %	Statistics	
Town	57	64.0%	Total Responses	89
Village or City	32	36.0%		



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54657 0 0.0% 54658 2 2.2% 54660 2 2.2% 54662 0 0.0% 54664 8 8.6% 54665 8 8.6% 54666 0 0.0% 54667 8 8.6%	54655	4	4.3%
54658 2 2.2% 54660 2 2.2% 54662 0 0.0% 54664 8 8.6% 54665 8 8.6% 54666 0 0.0% 54667 8 8.6%	54656	0	0.0%
54660 2 2.2% 54662 0 0.0% 54664 8 8.6% 54665 8 8.6% 54666 0 0.0% 54667 8 8.6%	54657	0	0.0%
54662 0 0.0% 54664 8 8.6% 54665 8 8.6% 54666 0 0.0% 54667 8 8.6%	54658	2	2.2%
54664 8 8.6% 54665 8 8.6% 54666 0 0.0% 54667 8 8.6%	54660	2	2.2%
54665 8 8.6% 54666 0 0.0% 54667 8 8.6%	54662	0	0.0%
54666 0 0.0% 54667 8 8.6%	54664	8	8.6%
54667 8 8.6%	54665	8	8.6%
	54666	0	0.0%
54670 3 3.2%	54667	8	8.6%
	54670	3	3.2%

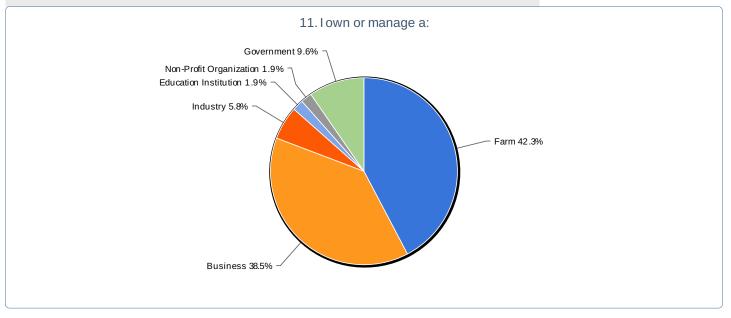
9. Please check your Home zip code below:

Statistics	
Total Responses	93
Sum	5,070,641.0
Avg.	54,523.0
StdDev	326.5
Max	54,670.0



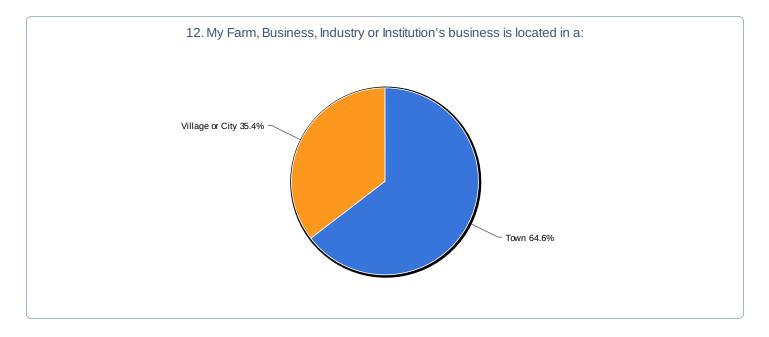
10. Do you own or manage a Farm, business, industry or institution?

Value	Count	Percent %	Statistics	
Yes	52	52.5%	Total Responses	99
No	47	47.5%		



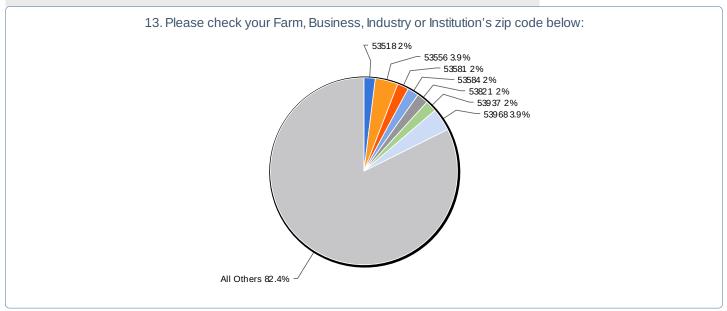
11. I own or manage a:

Value	Count	Percent %	Statistics	
Farm	22	42.3%	Total Responses	52
Business	20	38.5%		
Industry	3	5.8%		
Health Institution	0	0.0%		
Education Institution	1	1.9%		
Non-Profit Organization	1	1.9%		
Government	5	9.6%		



12. My Farm, Business, Industry or Institution's business is located in a:

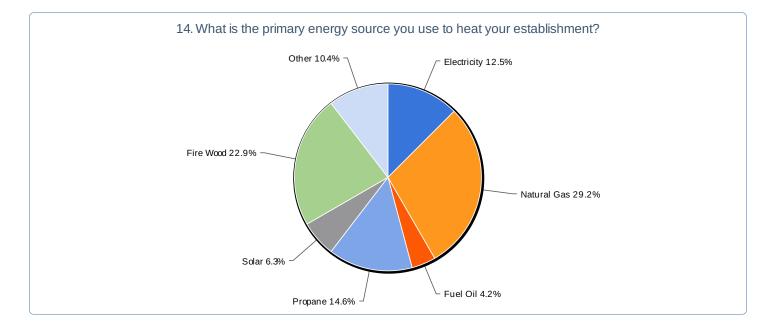
Value	Count	Percent %	Statistics	
Town	31	64.6%	Total Responses	48
Village or City	17	35.4%		



Value	Count	Percent %
53518	1	2.0%
53540	0	0.0%
53556	2	3.9%
53573	0	0.0%
53581	1	2.0%
53584	1	2.0%
53805	0	0.0%
53821	1	2.0%
53826	0	0.0%
53924	0	0.0%
53929	0	0.0%
53937	1	2.0%
53968	2	3.9%
54618	0	0.0%
54619	1	2.0%
54620	1	2.0%
54621	2	3.9%
54623	2	3.9%
54624	0	0.0%
54626	0	0.0%
54628	0	0.0%
54631	3	5.9%
54632	1	2.0%
54634	2	3.9%
54638	1	2.0%
54639	7	13.7%
54640	0	0.0%
54645	0	0.0%
54648	2	3.9%
54649	1	2.0%
54651	2	3.9%
54652	0	0.0%
54653	0	0.0%
54654	2	3.9%
54655	2	3.9%
54656	0	0.0%
54657	0	0.0%
54658	2	3.9%
54660	1	2.0%
54662	0	0.0%
54664	4	7.8%
54665	5	9.8%
54666	0	0.0%
54667	1	2.0%
54670	0	0.0%

13. Please check your Farm, Business, Industry or Institution's zip code below:

Statistics	
Total Responses	51
Sum	2,778,609.0
Avg.	54,482.5
StdDev	361.4
Max	54,667.0



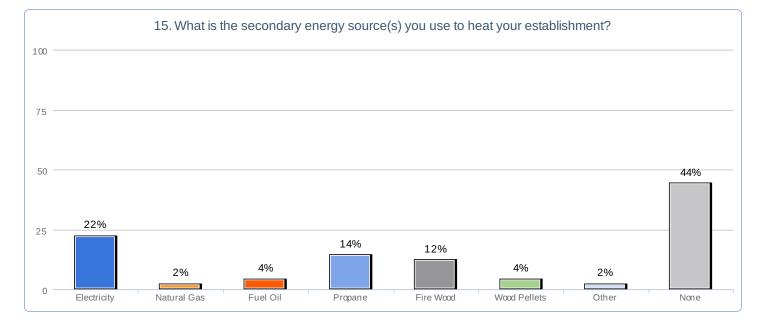
14. What is the primary energy source you use to heat your establishment?

geo-thermal

none

Mahaa	C	Devee at 0/	Charlistica
Value	Count	Percent %	Statistics
Electricity	6	12.5%	Total Responses
Natural Gas	14	29.2%	
Fuel Oil	2	4.2%	
Propane	7	14.6%	
Solar	3	6.3%	
Fire Wood	11	22.9%	
Wood Chips	0	0.0%	
Wood Pellets	0	0.0%	
Other	5	10.4%	
Open-Text Response Breakdown for "Other"			Cou
Geothermal ground source heat pump			
None (farm buildings)			
animal heat			

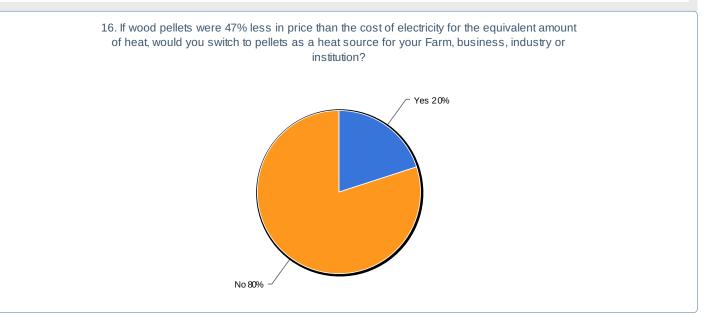
1



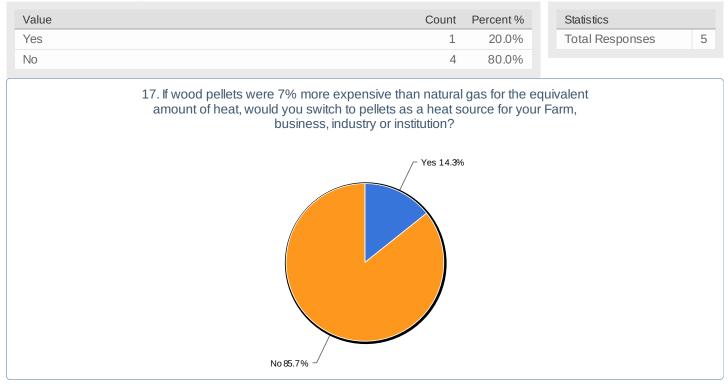
15. What is the secondary energy source(s) you use to heat your establishment?

Value	Count	Percent %	Statistics
Electricity	11	22.0%	Total Responses 50
Natural Gas	1	2.0%	
Fuel Oil	2	4.0%	
Propane	7	14.0%	
Solar	0	0.0%	
Fire Wood	6	12.0%	
Wood Chips	0	0.0%	
Wood Pellets	2	4.0%	
Other	1	2.0%	
None	22	44.0%	

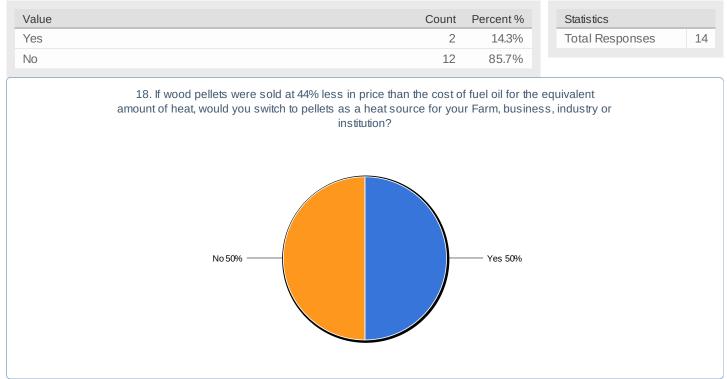
Open-Text Response Breakdown for "Other"	Count
Left Blank	104
geothermal system	1



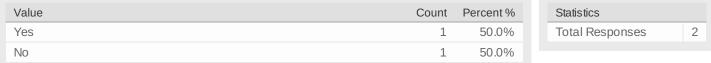
16. If wood pellets were 47% less in price than the cost of electricity for the equivalent amount of heat, would you switch to pellets as a heat source for your Farm, business, industry or institution?

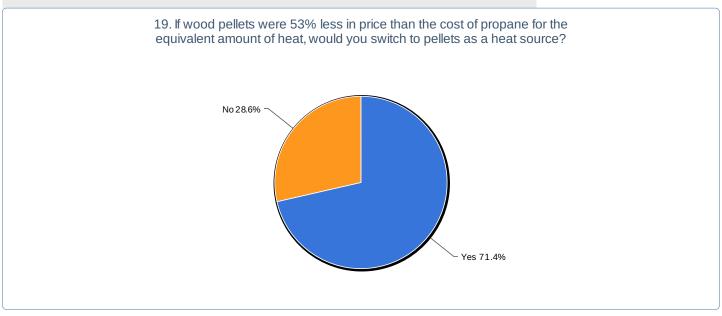


17. If wood pellets were 7% more expensive than natural gas for the equivalent amount of heat, would you switch to pellets as a heat source for your Farm, business, industry or institution?



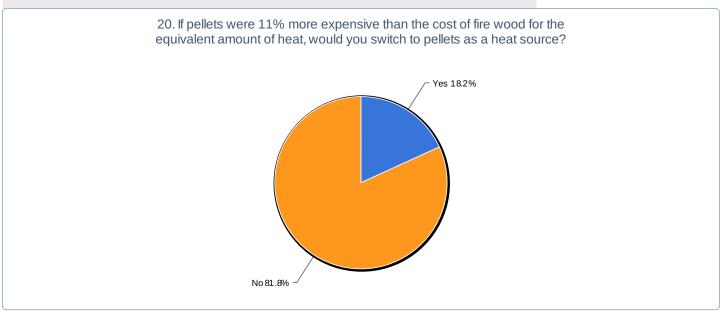
18. If wood pellets were sold at 44% less in price than the cost of fuel oil for the equivalent amount of heat, would you switch to pellets as a heat source for your Farm, business, industry or institution?





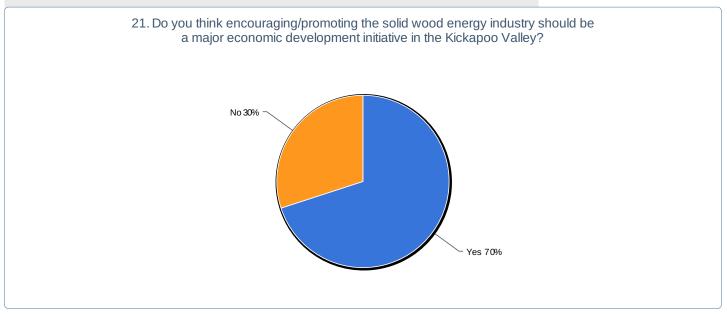
19. If wood pellets were 53% less in price than the cost of propane for the equivalent amount of heat, would you switch to pellets as a heat source?

Value	Count	Percent %	Statistics	
Yes	5	71.4%	Total Responses	7
No	2	28.6%		



20. If pellets were 11% more expensive than the cost of fire wood for the equivalent amount of heat, would you switch to pellets as a heat source?



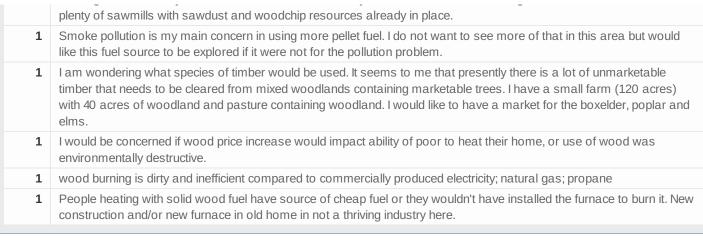


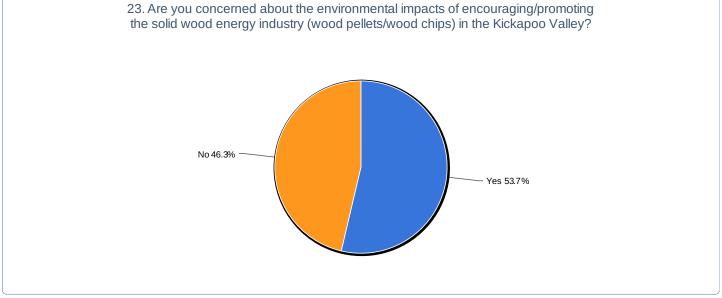
21. Do you think encouraging/promoting the solid wood energy industry should be a major economic development initiative in the Kickapoo Valley?

Value	Count	Percent %	Statistics	
Yes	63	70.0%	Total Responses	90
No	27	30.0%		

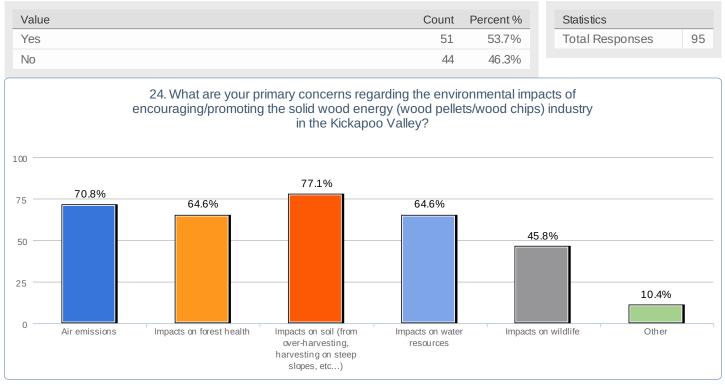
22. Please provide any comments regarding solid wood energy industry as a major economic development initiative in the Kickapoo Valley.

Count	Response
1	Any alternative energy is something that needs to be developed, analyzed and hopefully used.
1	Can't answer the above. I don't have enough information.
1	Good way to use tops after logging. they now mainly go to waste on our farm.
1	I would rather see a focus on those trees when they are standing, as a tourism piece.
1	If there is wood let us help out the ones who have wood to sell for a income.
1	It takes energy to produce wood fuel, and the byproduct is air pollution.
1	Need more information
1	Not in favor of development.
1	What is wrong with allowing the market to dictate need and demand.
1	good idea
1	yes
1	Still unclear on the TOTAL impact of solid wood energy. Planting, growth, harvest, drying, chipping (or other prep), particulate emissions and ash disposal/use
1	I don't think it would ever be a major economic player but I believe the the logging and wood industry could make better and wider use of the wood harvested.
1	I don't know, this would take some research to see the trade-offs between development in the area and sustaining the environment.
1	I like the fact that its a rebewable energy source especially for a crises situation. However the energy loss in a wood chipper outside stove looses a consideral amount of energy before it would reach the home. A wood stove is a better option in my opinion.
1	There is probably plenty of wood waste generated by all the small sawmills, but collecting and using that material economically and responsibly is a huge challenge.
1	When my woods were harvested, there was no market for biofuel. Maybe there will be in the future.
1	There are thousands of dead trees decaying in these hills. Some are already down, some are still standing. If we could convert them to pellets, it would benefit the landscape as well as the homeowners.
1	We used to have a producer of wood pellets in Viola, however the cost to maintain the business shut it down so we only have one local option.
1	IF solid wood energy harvest is used to improve timber stand management I'm all for it. IF, however, it is used to extract biomass and degrades the resource base it's suicide Proper forest management is of utmost importance.
1	The last time I had logging done, I had trouble getting rid of the cull logs. It would be great to see a market for timber not suitable for other purposes.
1	If we come together and build the market using quality methods and knowhow, we will all benefit from a sustainable harvest of wood.
1	Please remember that you are asking parts of the existing timber/lumber industry to handle cull material and tops. There is nothing easy or safe about trucking material that is curved (Not straight like logs). I have heard many complaints from log haulers who have tried to handle cull and top material for bio-mass.
1	This needs to be done in a sustainable manner and the local population would need to be educated as to the benefits.
1	Waste wood could be used to produce energy in clean burning centralized plants, especially in villages where there is density of commercial and institutional buildings.
1	The expansion of natural gas discoveries and the volume that has been discovered is going to make natural gas very tough to compete against economically. Wood chips will need to be cheap. This explosion is hydrocarbon discoveries is changing the whole outlook of some renewable energies and they are finding more supplies every day.
1	Wood seems to be a viable fuel source and area that has potential for economic development in our area. More people are switching to pellets and I think that the demand for them will continue into the future.
1	Worth exploring all options. Fossil fuels will continue to be more costly. Look not at cost differential today but long term.
1	It would seem that there is great potential for this because the Valley is so heavily forested. Periodic thinning and culling of these forests could provide the necessary fuel for this industry.
1	As long as the industry utilizes resources that are already here and doesn't start cutting new tree's to do it. There are





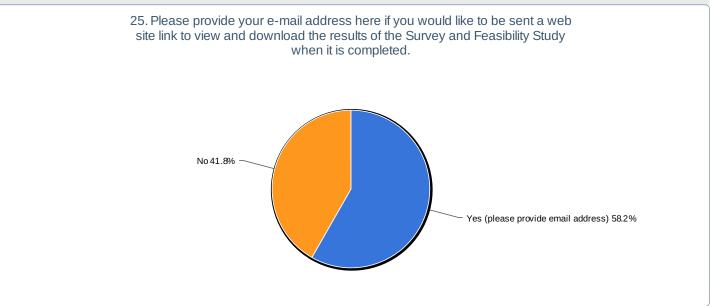
23. Are you concerned about the environmental impacts of encouraging/promoting the solid wood energy industry (wood pellets/wood chips) in the Kickapoo Valley?



24. What are your primary concerns regarding the environmental impacts of encouraging/promoting the solid wood energy (wood pellets/wood chips) industry in the Kickapoo Valley?

Value	Count	Percent %	Statistics	
Air emissions	34	70.8%	Total Responses	48
Impacts on forest health	31	64.6%		
Impacts on soil (from over-harvesting, harvesting on steep slopes, etc)	37	77.1%		
Impacts on water resources	31	64.6%		
Impacts on wildlife	22	45.8%		
Other	5	10.4%		

Open-Text Response Breakdown for "Other"	Count
Left Blank	100
Impact on our rural home	1
Impacts of town roads	1
Trees good air conditioners - shade, wind protection give off oxygen, we need them!	1
impacts on other local energy providers	1
positive impacts compared to petroleum	1



25. Please provide your e-mail address here if you would like to be sent a web site link to view and download the results of the Survey and Feasibility Study when it is completed.

Value	Count	Percent %	Statistics	
Yes (please provide email address)	53	58.2%	Total Responses	91
No	38	41.8%		

Open-Text Response Breakdown for "Yes (please provide email address)"

E-mail addresses are hidden to protect individual's privacy.

Count

26. Please provide any additional comments you may have regarding the expansion of wood pellet and/or wood chip heating in the Kickapoo Valley.

Count	Response
1	Again, more information
1	Go for it!
1	I forgot to include transportation costs and impact in my concerns
1	If it is financially doable it will happen on its own.
1	If this could be expanded, maybe the cost of pellets could come down.
1	It seems a reasonable idea if it can be accomplished in a sustainable manner!
1	The more people know about this concept, the more support there will be for it.
1	We would encourage the expansion of increased use of all wood products.
1	yes
1	I think that wood fuel is preferable to oil or propane, but not preferable over solar, wind, or geothermal. We need to
	promote the use of all energy sources that are renewable, but also least impacting on the world environment. The cost over time and the payback on investment over time both monetarily and in labor intensity. Needs to be factored in.
1	Don't have enough information to complete the survey intelligently. Need to know if it would cause air quality problems and if it would cause too many trees to be cut down.
1	I think chips used for heating homes, schools, businesses, etc. are a great idea. Challenge may be dealing with slopes and equipment limitations.
1	If the study doesn't make the case for pellets or chips, I hope you'll be creative and look to other options for wood products - mulch, grilling coal etc.
1	There are gasification wood furnaces that operate much more efficiently than even catalytic wood burners. (Wood Gun, Essex) The gasification furnace uses an induction fan rather than a blower, inducing a down draft into a refractory. The gasses emitted from the hot wood are burned first, greatly reducing unspent combustibles. Both brands have wood pellet feeders and can be outside units.
1	I have been heating my resident with wood pellets for over 10 years and they have been a good source of heat. The only thing I would like to see is the price to be a little more economical.
1	We own a pellet stove and have yet to install it. Regarding my answer on not changing from propane if it was 53% less than pellets, we heat the downstairs of our home/business with wood and hope to supplement with pellets. But the upstairs is heated with propane primarily. The venting in the house makes this the most practical and efficient. If there were a way to switch our furnace over to pellets with little disruption, that would be something to interest us.
1	We have the resource of wood products and those that could be used will be wood that could be harvested for this use would fit TSI needs. It will be expensive to do this properly and any investment in this will face extremely stiff competition from hydrocarbon fuels. It needs to be feasible without tax payer funds to make it work. It will take some seed money to start this but your business plan needs to work without continued subsidies such as solar and wind still need to make them work.
1	I think that your questions about pellets being over 7% more than NG is misleading and unproductive. NG goes up and down so you'll never be able to pin it down.
1	If done properly, it would help the economy and there would be less waste when the woods are harvested.
1	I am in favor of development of wood heating if ALL of the products taken from our forests are used ONLY LOCALLY and never shipped away. The wood belongs HERE
1	I'm the Monroe County Economic Development Coordinator and I based this survey off of my family farm. We are having our Annual Monroe County Economic Development Conference on Feb. 24, 2014 and one of our panels is on alternative energy. I'd love to invite you to be part of the event. Please use my e-mail address that I used in this survey to contact me. Thanks!
1	Locally produced pellets could be a local source of employment, sourcing material has to be done responsibly.
1	Do we have any companies around la farge that has a lot of excess wood chips that could push or support a mass increase in demand of wood chips. Or would they be creating this company?
1	I'm not saying we all should BURN wood!! I'm saying we should manufacture wood pellets! Decaying wood produces carbon dioxide just as burning wood does so I'm not concerned about the CO2 but I'm concerned about particulates. But somebody is going to burn wood pellets and we should take advantage of the market!

Appendix C

US Pellet Plants

US PELLET PLANTS

OPERATIONAL US PLANTS BY REGION (METRIC TONS)

Northeast

Plant	State	Feedstock	Capacity	
	ME	HRDWD and	• •	
Corinth Wood Pellets LLC	ME	SFTWD	75,000	
Geneva Wood Fuels	ME	HRDWD	90,000	
Maine Woods Pellet Company	ME	HRDWD and SFTWD	105,000	
Northeast Pellets LLC	ME	HRDWD and SFTWD	40,000	
Jaffrey Manufacturing Facility	NH	HRDWD and SFTWD	84,000	
Associated Harvest Inc.	NY	HRDWD	8,000	
Dry Creek Products	NY	HRDWD	100,000	
Curran Renewable Energy	NY	HRDWD and SFTWD	100,000	
Essex Pallet & Pellet	NY	HRDWD and SFTWD	6,000	
Hearthside Wood Pellets	NY	HRDWD	700	
Deposit Manufacturing Facility	NY	HRDWD and SFTWD	84,000	
Schuyler Manufacturing Facility	NY	HRDWD and SFTWD	84,000	
Instantheat Wood Pellets Inc.	NY	HRDWD	50,000	
Alexander Energy Inc	PA	HRDWD	8,500	
Allegheny Pellet Corporation	PA	HRDWD	70,000	
Barefoot Pellet Company	PA	HRDWD	45,000	
Nazareth Pellets	PA	SFTWD	50,000	
PA Pellets	PA	SFTWD	50,000	
Energex Pellet Fuel, Inc.	PA	HRDWD	120,000	
Great American Pellets	PA	HRDWD	30,000	
Greene Team Pellet Fuel Company	РА	HRDWD	50,000	
Log Hard Premium Pellets Inc.	PA	HRDWD	25,000	
Pellheat Inc.	PA	HRDWD	5,000	
Penn Wood Products, Inc.	PA	HRDWD	5,000	
Tri State Biofuels	PA	SFTWD	50,000	
Wood Pellets C&C Smith Lumber	РА	HRDWD	36,000	
Vermont Wood Pellet Co. LLC	VT	SFTWD	15,000	

Midwest

Plant	State	Feedstock	Capacity
Koetter & Smith, Inc.	IN	HRDWD	205,000
Southern Indiana Hardwoods	IN	HRDWD	10,000
American Dellet Company	мі	HRDWD	12.000
American Pellet Company	IVII	and SFTWD	12,000
Wolverine Hardwood Pellets	MI	HRDWD	1,000
Faunctock Clara	N 41	HRDWD	26,000
Equustock - Clare	MI	and SFTWD	36,000
Fiber By-Products - White	м	HRDWD	60,000
Pigeon	IVII	HKDVVD	60,000
Isabella Pellet	м	HRDWD	40,000
	IVII	and SFTWD	40,000
Kirtland Products, LLC	мі	HRDWD	35,000
		and SFTWD	33,000
Maeder Brothers Quality	м	HRDWD	18,000
Wood Pellets, Inc.	IVII		10,000
Michigan Timber	MI	SFTWD	18,000

Michigan Wood Fuels	MI	HRDWD	50,000
Michigan wood rueis	IVII		30,000
Vulcan Wood Products	MI	HRDWD	9,000
		and SFTWD	
Wood Pellet Coop	MN	HRDWD	Undisclosed
Ozark Hardwood Products	MO	HRDWD	85,000
Show Ma Energy Cooperative	мо	Biomass	15,000
Show Me Energy Cooperative	IVIO	Crops	15,000
Having Rief als has	NE	HRDWD	20.000
Horizon Biofuels Inc.	NE	and SFTWD	20,000
American Wood Fibers -		HRDWD	
Circleville	ОН	and SFTWD	50,000
Deadwood Biofuels LLC	SD	SFTWD	71,000
American Wood Fibers -	-	HRDWD	
Wisconsin	WI	and SFTWD	25,000
	WI	HRDWD	
Dejno's Inc.		and SFTWD	40,000
Fiber Recovery Inc.	WI	HRDWD	13,000
Great Lakes Renewable		HRDWD	
Energy, Inc.	WI	and SFTWD	70,000
Green Friendly Pellets, LLC	WI	HRDWD	17,000
Indeck Energy Ladysmith	VVI	TINDWD	17,000
Biofuel Center LLC	WI	HRDWD	90,000
Marth Peshtigo Pellet	WI	HRDWD	64,000
Company			-
Marth Wood Shavings Supply	WI	HRDWD	24,000

West

Plant	State	Feedstock	Capacity
Mallard Creek Inc.	CA	SFTWD	60,000
Confluence Energy-Kremmling	CO	SFTWD	100,000
Confluence Energy-Walden	CO	SFTWD	65,000
Environmental Energy Partners	CO	SFTWD	18,000
Jensen Lumber Co.	ID	SFTWD	15,000
Lignetics of Idaho Inc	ID	SFTWD	80,000
North Idaho Energy Logs Inc.	ID	SFTWD	60,000
North Idaho Energy Logs Inc.	ID	SFTWD	45,000
Lemhi Valley Pellets	ID	HRDWD and SFTWD	2,600
Rocky Canyon Pellet Co.	ID	HRDWD and SFTWD	10,000
Bear Mountain Forest Products - Cascade Locks	OR	SFTWD	40,000
Bear Mountain Forest Products- Brownsville	OR	SFTWD	120,000
Blue Mountain Lumber Products	OR	SFTWD	20,000
Frank Pellets	OR	SFTWD	21,000
Malheur Pellet Mill	OR	SFTWD	18,000
Pacific Pellet LLC	OR	HRDWD	40,000
Dillard Composite Specialties	OR	SFTWD	40,000
West Oregon Wood Products - Banks	OR	SFTWD	30,000
West Oregon Wood Products - Columbia City	OR	SFTWD	50,000
Woodgrain Millwork Inc.	OR	SFTWD	Undisclosed
Manke Lumber Company	WA	HRDWD	38,000
Olympus Pellets - Shelton	WA	SFTWD	50,000
Arbor Pellet LLC	UT	HRDWD and SFTWD	85,000
Bearlodge Forest Products	WY	SFTWD	5,000

Southeast

Plant	State	Feedstock	Capacity
Equustock - Jasper	AL	HRDWD and SFTWD	36,000
Lee Energy Solutions	AL	HRDWD	110,000
Nature's Earth Pellets - Reform	AL	SFTWD	75,000
Westervelt Renewable Energy,	AL	SFTWD	309,000
Fiber Energy Products AR LLC	AR	HRDWD	110,000
Fiber Resources Inc.	AR	HRDWD	Undisclosed
Equustock - Montebrook	FL	SFTWD	40,000
Green Circle Bio Energy Inc	FL	HRDWD and SFTWD	560,000
Appling County Pellets LLC	GA	HRDWD and SFTWD	200,000
Georgia Biomass	GA	HRDWD and SFTWD	825,000
SEGA Biofuels LLC	GA	SFTWD	150,000
Varn Wood Products	GA	SFTWD	80,000
Somerset Pellet Fuel	KY	HRDWD	50,000
Southern Kentucky Pellet Mill	KY	HRDWD	12,000
Anderson Hardwood Pellets	KY	HRDWD	25,000
Bayou Wood Pellets	LA	HRDWD and SFTWD	60,000
New Biomass Energy	MS	HRDWD and SFTWD	250,000
Enviva Pellets Amory	MS	HRDWD and SFTWD	100,000
Enviva Pellets Wiggins	MS	HRDWD and SFTWD	150,000

Enviva Pellets Ahoskie	NC	HRDWD and SFTWD	385,000
Nature's Earth Pellets -	NC	HRDWD and	100,000
Laurinburg	NC.	SFTWD	100,000
Low Country Biomass	SC	HRDWD	240,000
Ace Pellet Co. LLC	TN	HRDWD	10,000
Hassell & Hughes Lumber Co.	TN	HRDWD	3,000
Henry County Hardwoods Inc.	TN	HRDWD	40,000

Southwest

Plant	State	Feedstock	Capacity	
Forest Energy Corp.	AZ	SFTWD	62,000	
Equustock - Raton	NM	HRDWD	40,000	
	INIVI	and SFTWD	40,000	
Mt. Taylor Machine Pellet Fuel	NM	HRDWD	6,000	
	INIVI	and SFTWD	0,000	
German Pellets Texas	тх	HRDWD	550,000	
German Pellets Texas		and SFTWD	550,000	
Patterson Wood Products Inc.	ТΧ	SFTWD	40,000	
Appalachian Wood Pellets	WV	HRDWD	Undisclosed	
Hamer Pellet Fuel Elkins	WV	HRDWD	60,000	
Lignetics of West Virginia Inc.	WV	HRDWD	125,000	

Other

Plant	State	Feedstock	Capacity
Superior Pellet Fuels LLC	AK	HRDWD	12,000

US PELLET PLANTS UNDER CONSTRUCTION (METRIC TONS)

Plant	State	Feedstock	Capacity
International Biomass Energy LLC	AL	HRDWD and SFTWD	500,000
Selma Plant	AL	HRDWD and SFTWD	300,000
Dover Resources, Inc.	CA	HRDWD and SFTWD	35,000
Vulcan Renewables LLC	FL	SFTWD	120,000
Fulghum Graanul Oliver LLC	GA	HRDWD and SFTWD	200,000
German Pellets Urania	LA	SFTWD	1,000,000
F.E. Wood & Sons - Natural Energy	ME	HRDWD and SFTWD	35,000
Enviva Pellets Northampton	NC	HRDWD and SFTWD	500,000
Enviva Pellets Southampton	VA	HRDWD and SFTWD	500,000

PROPOSED US PELLET PLANTS (METRIC TONS)

Plant	State	Feedstock	Capacity
Crockett Plant	TX	Hardwood and Softwood	44,000
Beaver Wood Energy	VT	Hardwood and Softwood	110,000
Biomass Power Louisiana LLC	LA	Softwood	1,000,000
Morehouse BloEnergy	MA	Woody Biomass	500,000
Enova Energy- Gordon	GA	Softwood	550,000
Enova Energy- Warrenton	GA	Softwood	550,000
First Georgia BioEnergy	GA	Softwood	38,000
Fram Renewable Fuels - Hazlehurst	GA	Softwood	500,000
General Biofuels - Georgia	GA	Softwood	440,000
Highland Biofuels LLC	KY	Hardwood	100,000
Mt. Taylor - WoodYouRecycle! Facility	NM	Hardwood and Softwood	6,000
Franklin Pellets	VA	Hardwood and Softwood	500,000
Nex Gen Biomass	AR	Softwood	500,000
Riverside Pellets, LLC	NC	Hardwood and Softwood	50,000
Thermogen Industries	NH	Woody Biomass	110,000

Appendix D

Possible Sources of Wood Residue

POSSIBLE SOURCES OF WOOD RESIDUE

Primary Forest Industry					
Company	Түре	Сіту	STATE	COUNTY	ANNUAL PROD. (MBF)
Fillmore Sawmill	Stationary	WYKOFF	MN	Fillmore	0-100
ROOT RIVER HARDWOODS INC.	STATIONARY	PRESTON	MN	FILLMORE	3000+
BILL JOHNSTON	Portable	HOUSTON	MN	HOUSTON	0-100
CRYSTAL VALLEY HARDWOODS	STATIONARY	HOUSTON	MN	HOUSTON	1001-3000
STAGGEMEYER STAVE CO	STATIONARY	CALEDONIA	MN	HOUSTON	1001-3000
CLAUDE PATZNER	STATIONARY	UTICA	MN	WINONA	0-100
GINGERICH SAWMILL	STATIONARY	ST. CHARLES	MN	WINONA	101-500
MONTANA CATTLE AND TIMBER	STATIONARY	WINONA	MN	WINONA	0-100
PETE JILK	PORTABLE	ST. CHARLES	MN	WINONA	0-100
Том Неім	PORTABLE	ST. CHARLES	MN	WINONA	0-100
HEITMAN LUMBER	SAWMILL	DURAND	WI	BUFFALO	1,500
Serum Lumber	SAWMILL	ALMA	WI	BUFFALO	400
BILL FOLEY	SAWMILL	EASTMAN	WI	CRAWFORD	200
		-			
HAMEL FOREST PRODUCTS (FERRYVILLE)	SAWMILL	VESPER	WI	CRAWFORD	3,500
Nelson Hardwood Lumber	SAWMILL	PR DU CHIEN	WI	CRAWFORD	7,500
	SAWMILL	FENNIMORE	WI	GRANT	25
DRESSLER SAWMILL	SAWMILL	LANCASTER	WI	GRANT	75
F&N MILLS	SAWMILL	Boscobel	WI	GRANT	350,
Frazier & Sons Logging and Lumber	Sawmill	BLUE RIVER	WI	GRANT	2,000
GARY B FULLER	Sawmill	Pr Du Chien	WI	GRANT	500,
MICHAEL UDELHOFEN SAWMILL	Sawmill	CASSVILLE	WI	GRANT	120
SCHWABE ENTERPRISES	Sawmill	Muscoda	WI	GRANT	300
SOUTHERN WISCONSIN SILO CO	Firewood	BLUE RIVER	WI	GRANT	114
WIELAND & SONS	SAWMILL	Muscoda	WI	GRANT	2,000
Nelson Hardwood Lumber Co Inc	SAWMILL	Muscoda	WI	Iowa	3,000
BLACK RIVER COUNTRY LOG HOMES INC.	LOG HOME	BLACK RIVER FALLS	WI	JACKSON	300
LEVIS CREEK FOREST PRODUCTS	SAWMILL	BLACK RIVER FALLS	WI	JACKSON	2,000
Meisters Forest Products	SAWMILL	BLACK RIVER FALLS	WI	JACKSON	10,000
JOHN'S WELDING	Firewood	Томан	WI	Monroe	91
Ron Larson Sawmill	SAWMILL	CASHTON	WI	MONROE	300
GRELL LUMBER CO	Sawmill	Gotham	WI	RICHLAND	3,000
Riverside Sawmill	Sawmill	Muscoda	WI	RICHLAND	5,000
Rockbridge Sawmill Inc	Sawmill	RICHLAND CENTER	WI	RICHLAND	5,000
HACK-AWAY FOREST PRODUCTS INC	SAWMILL	BARABOO	WI	SAUK	1,500
Midwest Hardwoods	Sawmill	REEDSBURG	WI	SAUK	15,000
RAY ZOBEL & SON INC	SAWMILL	REEDSBURG	WI	SAUK	50
Red Beard Lumber, LLC	SAWMILL	SPRING GREEN	WI	SAUK	100
RUHLAND HARLAND SAWMILL	SAWMILL	LOGANVILLE	WI	SAUK	400
TIMBERGREEN	SAWMILL	SPRING GREEN	WI	SAUK	20
BLAIR HARDWOODS	SAWMILL	BLAIR	WI	TREMPEALEAU	4,000
HAWKEYE FOREST PRODUCTS	SAWMILL	TREMPEALEAU	WI	TREMPEALEAU	4,500
Koxlien Bros Wood Products			WI		,
	SAWMILL	STRUM			5,000
PINE CREEK PALLET CO	SAWMILL	DODGE	WI		454
S&S Wood Products Inc	SHAVINGS	INDEPENDENCE	WI	TREMPEALEAU	2,727
COOK CREEK SAWMILL	SAWMILL	NORWALK	WI	VERNON	200
	SAWMILL		WI	VERNON	200
ELIYODER	SHAVINGS	WESTBY	WI	VERNON	100
EMANUEL P MILLER	SAWMILL	LAFARGE	WI	VERNON	200
ERVIN MILLER	SAWMILL	CHASEBURG	WI	VERNON	300
JACOB SCHROCK	Sawmill	WESTBY	WI	VERNON	300
WHITE CITY LUMBER INC.	Sawmill	Hillsbord	WI	VERNON	2,000
SCHROER HARDWOOD LUMBER CO.	Sawmill	LAFARGE	WI	VERNON	1,000

Сомрану	Сіту	STATE	COUNTY	ANNUAL PROD. (MBF
Builders Millwork Inc	Mondovi	WI	Buffalo	0.5
Prairie Cabinet Shop	PRAIRIE DU CHIEN	WI	CRAWFORD	
Homette Corp (Div Skyline)	LANCASTER	WI	GRANT	
Roddy's Signs Inc	BOSCOBEL	WI	GRANT	6,000
Wisconsin Woodworks Inc	DICKEYVILLE	WI	GRANT	
TRI STAR PALLETS INC.	HIGHLAND	WI	IOWA	
Walnut Hollow Farm	Dodgeville	WI	IOWA	
Hart Tie & Lumber	BLACK RIVER FALLS	WI	JACKSON	
Levis Creek Forest Products	BLACK RIVER FALLS	WI	JACKSON	7,150
Endeavor Hardwoods	Lyndon Station	WI	JUNEAU	4,580
Meadow Valley Log Homes	MATHER	WI	JUNEAU	4,010
Necedah Pallet Co Inc	NECEDAH	WI	JUNEAU	5,750
Stan's Ind Woodwork Inc	Lyndon Station	WI	JUNEAU	4,000
Cabinet Factory Inc	LA CROSSE	WI	LACROSSE	125,000,000
Coulee Region Log Homes Co	HOLMEN	WI	LACROSSE	1.5
Creative Laminates Inc	Lacrosse	WI	LACROSSE	2,000
Design Cabinetry Inc	HOLMEN	WI	LACROSSE	1,000
Heram Cust Woodworking	Onalaska	WI	LACROSSE	
Modern Woodworking Inc.	LACROSSE	WI	LACROSSE	100,000
Northern Wood Prod Inc	LA CROSSE	WI	LACROSSE	
Realwood Products Inc	LA CROSSE	WI	LACROSSE	
3-D Enterprises	Sparta	WI	Monroe	10,500
MacDonald & Owen Veneer & Lumber Co	Sparta	WI	Monroe	75,000
Northland Pallet	Sparta	WI	Monroe	30,150
Universal Forest Products Inc	WARRENS	WI	Monroe	25,000
Agwoods Inc	RICHLAND CENTER	WI	RICHLAND	3,000
PINE RIVER WOODCRAFT	RICHLAND CENTER	WI	RICHLAND	4,000
RICHLAND PATTERNS INC	RICHLAND CENTER	WI	RICHLAND	2
Conifer West Woodworks	SPRING GREEN	WI	Sauk	15
Harms Cabinet & Millwork	REEDSBURG	WI	Sauk	
Hillcrest	HILLPOINT	WI	Sauk	15.5
Reedsburg Hardwoods	REEDSBURG	WI	Sauk	
SCHULTER WOOD PRODUCTS INC	Plain	WI	Sauk	5
Spiro Furniture	HILLPOINT	WI	Sauk	
Ashley Furniture Ind	WHITEHALL	WI	TREMPEALEAU	23
Ashley Furniture Industries	Arcadia	WI	TREMPEALEAU	2,500,000
Blade Millworks Inc	Strum	WI	TREMPEALEAU	
Hawkeye Forest Products	TREMPEALEAU	WI	TREMPEALEAU	3.7
Norwinn Company Inc	GALESVILLE	WI	TREMPEALEAU	
Speltz Sign Co	WHITEHALL	WI	TREMPEALEAU	600
Starwood Rafters Inc	INDEPENDENCE	WI	TREMPEALEAU	100,000

Appendix E

Wisconsin State Incentives

WISCONSIN STATE INCENTIVES

JOB CREATION DEDUCTION

Beginning with taxable years starting on or after January 1, 2011, a subtraction from federal income is allowed based on the increase in the number of full-time equivalent employees that are employed in Wisconsin during the taxable year. The subtraction from federal income is equal to \$2,000 per eligible employee for businesses with gross receipts greater than \$5 million or \$4,000 per eligible employee for businesses with gross receipts of \$5 million or less.

WHO IS ELIGIBLE TO CLAIM THE DEDUCTION

An individual, estate, trust, limited liability company (LLC), corporation or tax exempt corporation may claim the deduction.

WHO MAY NOT CLAIM THE DEDUCTION

Partnerships, LLCs treated as partnerships, and tax option (S) corporations cannot claim the deduction; however, the deduction computed by those business entities can pass through to the partners, members, or shareholders.

DEFINITIONS

"Full-time equivalent employee" means an employee who is a resident of Wisconsin, is employed in a regular, non-seasonal job, and who, as a condition of employment, is required to work at least 2080 hours per year, including paid leave and holidays. See Wis. Admin. Code Tax 3.05(2)(c).

"Employee" means any officer of a corporation or any individual who has the status of an employee or any individual who performs services for remuneration for any person. See sec. 3121(d) of the Internal Revenue Code.

CLAIMING THE DEDUCTION

Use Schedule JC to claim the job creation deduction. For further information, you may visit the department's website at revenue.wi.gov, write to the Wisconsin Department of Revenue, Mail Stop 5-144, PO Box 8906, Madison WI 53708-8906, or call the Department of Revenue at 608-266-2772.

DEDUCTION COMPUTATION

The deduction is based on the increase in the number of full-time equivalent employees employed by the taxpayer in Wisconsin during the taxable year, multiplied by \$4,000 for a business with gross receipts no greater than \$5 million in the taxable year or \$2,000 for a business with gross receipts greater than \$5 million in the taxable year.

QUALIFICATIONS

To qualify for the Wisconsin jobs creation deduction, you must meet all of the following conditions:

- The employer must increase the number of fulltime equivalent employees employed in Wisconsin during the taxable year
- The employer can be an existing business or a new business
- The business relocation credit or deduction cannot also be claimed

JOBS TAX CREDIT

The Jobs Tax Credit is available for businesses for taxable years that begin on or after January 1, 2010.

CLAIMING THE CREDIT

Use Schedule JT to claim the Jobs Tax Credit and include the schedule with your Wisconsin franchise or income tax return. Also include a copy of the certificate of eligibility to claim tax benefits issued by the WI EDC when the tax return is filed. For more information regarding how to become certified, visit the WI EDC web site at www.wedc.org.

WHO IS ELIGIBLE TO COMPUTE THE CREDIT

An individual, estate, trust, partnership, limited liability company (LLC), corporation, or tax-exempt organization that is certified by the WI EDC may compute the credit.

WHO MAY NOT CLAIM THE CREDIT

Partnerships, LLCs treated as partnerships, and tax option (S) corporations cannot claim the credit; however, the credit computed by those business entities can pass through to the partners, members, or shareholders.

CREDIT IS INCOME

QUALIFICATIONS

To qualify for the Wisconsin Jobs Tax Credit, you must meet all of the following conditions:

- The WI EDC must certify that the claimant is operating or intends to operate a business in Wisconsin and that a contract has been entered into with the Wisconsin EDC.
- The claimant has received from the WI EDC a notice of eligibility to receive tax benefits that reports the amount of tax benefit for which claimant is eligible.

CREDIT COMPUTATION

The credit is based on the amount of wages paid to eligible employees in the taxable year, subject to a maximum amount of ten percent of such wages, and the costs incurred by the claimant to undertake training activities in current year.

UNUSED CREDITS

For taxable years that began in 2010 and 2011, the Jobs Tax Credit could only be used to reduce the amount of tax owed to zero. If there are unused credits remaining from those years, they may be carried forward to taxable years beginning in 2012 when the credit can be used to reduce the amount of tax to zero and any remaining credit will be refunded.

The amount of credit computed on Schedule JT is income and must be reported on your Wisconsin franchise or income tax return for the year computed.

WISCONSIN MANUFACTURING AND AGRICULTURE CREDIT

The manufacturing and agriculture credit is available to individuals and entities for taxable years that begin on or after January 1, 2013, for manufacturing and agricultural activities in Wisconsin.

CLAIMING THE CREDIT

A schedule to be used for claiming the credit will be available on the department's website by December 1, 2013.

WHO IS ELIGIBLE TO CLAIM THE CREDIT An individual, estate, trust, partnership, limited liability company (LLC), or corporation can compute the credit if the claimant owns or rents and uses in Wisconsin real property and improvements assessed as agriculture property under s. 70.32(2)(a)4., Wis. Stats., or owns or rents and uses in Wisconsin real and personal manufacturing property assessed under s. 70.995, Wis. Stats.

Partnerships, LLCs treated as partnerships, and tax-option (S) corporations cannot claim the credit; however, the credit computed by those business entities can pass through to the partners, members, or shareholders.

Trusts and estates may pass the credit through to their beneficiaries based on the income allocable to each.

WHO MAY NOT CLAIM THE CREDIT Insurance companies cannot claim the credit.

Note: A person who rents land to, for example a farmer, to be used in agriculture cannot claim the credit based on the rental income. Only the farmer who rented the land and used it in agriculture may use the rented land value in computing the credit.

CREDIT COMPUTATION

The credit is a percentage of "eligible qualified production activities income." The credit is calculated by multiplying eligible qualified production activities income by one of the following percentages.

- For taxable years beginning after December 31, 2012, and before January 1, 2014, 1.875 percent
- For taxable years beginning after December 31, 2013, and before January 1, 2015, 3.75 percent
- For taxable years beginning after December 31, 2014, and before January 1, 2016, 5.526 percent
 - For taxable years beginning after December 31, 2015, 7.5 percent

For a corporation, eligible qualified production activities income is the lesser of:

- eligible qualified production activities income,
- income apportioned to Wisconsin, or
- income taxable to Wisconsin as determined by combined reporting law, if the corporation is a member of a Wisconsin combined group

Income from the following activities may not be used to claim the credit

- Film production,
- Producing, transmitting or distributing electricity, natural gas, or potable water,
- Constructing real property (except that income from producing real property can qualify for the credit),
- The sale of food and beverage that you prepared at a retail establishment,
- The lease, rental, license, sale, exchange, or other disposition of land, and
- Engineering or architectural services.

CREDIT IS INCOME

The amount of credit that is claimed is income and must be reported as income on the claimant's Wisconsin franchise or income tax return for the taxable year Page 2 of 2 immediately after the taxable year in which the credit is computed.

UNUSED CREDITS

- The amount of credit not entirely offset against Wisconsin income or franchise taxes may be carried forward and credited against Wisconsin income or franchise taxes due for up to fifteen years.
- The credit can only be used to offset the Wisconsin franchise or income tax due of the corporation that generated it. It cannot be shared with other members of a combined group.
- Nothing in this fact sheet replaces or changes any provisions of Wisconsin tax law, administrative rules, or court decisions.

PROPERTY TAX EXEMPTION FOR MANUFACTURING MACHINERY AND EQUIPMENT

Under sec. 70.11(27)(b), Wis. Stats., "machinery and specific processing equipment; and repair parts, replacement machines, safety attachments and special foundations for that machinery and equipment; that are used exclusively and directly in the production process in manufacturing tangible personal property, regardless of their attachment to real property, but not including buildings" are exempt from property tax. The statute specifies that the exemption is to be strictly construed and provides definition of "building," "machinery," "manufacturing," "production process," "used directly," and "used exclusively," among other terms.

To qualify for the machinery and equipment (M&E) exemption, a business must first be classified as "manufacturing." These are activities that are classified as "manufacturing" in the Standard Industrial Classification Manual. In addition, mining, photo finishing laboratories, scrap metal processing, wastepaper processing and hazardous waste facilities are defined to be manufacturing activities. [See attached for a complete list of manufacturing activities.] A business owned by a manufacturer but not classified manufacturing does not qualify for the M&E exemption.

Once classified manufacturing, the property must be used exclusively and directly in the manufacturing production process to be exempt. The production process begins with the conveyance of raw materials to the first work point and ends with the conveyance of the finished product to the place of first storage. Thus, receipt, inspection and storage of raw materials and storage of finished products are not part of the production process.

To be used directly in the production process means that the qualifying property must cause a physical or chemical change in raw materials or cause a movement of raw materials. Equipment used only to preserve or protect raw materials is considered taxable storage equipment. The property may not be used for other purposes more than 5% of its total use.

Exempt items include the following:

- Machinery and specific processing equipment
- Repair parts
- Replacement machines
- Safety attachments
- Special foundations for qualifying machinery and equipment
- Parts of buildings that are part of the production process, e.g. kilns, malt aging silos, graving docks used as conveyers, work platforms or measuring instruments
- Equipment used for storing work in process less than three days
- Forklifts/conveyers used at least 95% of time for moving material along production line
- Quality control equipment used for testing the product manufactured
- Power wiring
- Motors, compressors and computers that exclusively power or operate exempt machines
- Process piping
- Packaging equipment, including in-house printing of labels, instructions, manuals
- Hand tools used with exempt machines
- Computers used in manufacturing process

Taxable items include the following:

- Boilers, generators, transformers
- Quality control equipment of raw materials received
- Shipping and receiving equipment
- Raw material storage equipment, e.g. racks, tanks, silos, refrigeration
- Finished product storage equipment, including refrigeration
- Storage equipment for work in process stored for more than three days
- Forklifts and shelving used in warehouses
- Equipment to maintain and repair production machines, buildings and grounds
- Communication equipment
- Research and development equipment used for new products or improving existing products
- Pilot plants involved with prototype development where sample products are not sold to customers
- Creative work by authors, artists, ad agencies, photographers, etc.
- In addition to the M&E exemption, there are separate exemptions for waste treatment facilities and computers.

Manufacturing Activities

- Metal mining
- Mining and quarrying of nonmetallic minerals, except fuels
- Food and kindred products
- Tobacco manufacturers
- Textile mill products
- Apparel and other finished products made from fabrics and similar materials
- Lumber and wood products
- Furniture and fixtures
- Paper and allied products
- Printing, publishing, and allied industries
- Chemicals and allied products
- Petroleum refining and related industries
- Rubber and miscellaneous plastic products
- Leather and leather products
- Stone, clay, glass and concrete products
- Primary metal industries
- Fabricated metal products, machinery and transportation equipment
- Machinery
- Electrical and electronic machinery, equipment and supplies
- Transportation equipment
 - Measuring, analyzing and controlling instruments; photographic, medical and optical goods; watches and clocks
- Photofinishing laboratories
- Scrap processors
- Processors of waste paper, fibers or plastics
- Hazardous waste treatment facilities

Appendix F

PFI Pellet Stove Fact Sheet



PELLET STOVES

Once you experience a pellet stove, it's easy to understand why people rave about these efficient and unique home heaters that generate an automated, economical and earth-friendly wood heat...and all without firewood! For just pennies an hour, a pellet stove can deliver a deep, penetrating warmth that provides independence from high heating bills while emitting almost no wood smoke. And, with tremendous flexibility in installation and sizing, pellet stoves are a sophisticated choice for convenient heat that helps protect the environment and doesn't break the bank.

Help Take Control of Heating Costs

Pellet stoves are the perfect choice for people that often experience high home heating bills due to fluctuating energy costs. In fact, pellet stoves are often installed in homes as secondary heat sources to help maintain control over heating expenses. The reason is the fuel. Pellet stoves burn economical pellets made from recycled sawdust. The economy of pellets is due to the low cost of the materials and the efficiency of the manufacturing processes, as well as the ability for people to lock in an entire year of fuel costs before the beginning of the heating season.



Efficient Heat and Minimal Emissions

Pellet stoves are efficient home heaters thanks to state-of-the-art technology that helps control the fuel-to-air ratio within the stove and ensures almost complete combustion of the fuel. This technology helps to generate minimal wood smoke, making pellet stoves the lowest emission solid-fuel burning hearth products available today and a popular choice in areas where winter air quality is an issue.

Automated Wood Burning

A pellet stove is an automated wood burner. Pellet stoves operate with an easy-to-use convenience while providing a rich, radiant and convection heat. To use a pellet stove, simply load a supply of pellets into the hopper and start the stove. Once the stove is operating, an automated feed system delivers the wood pellets into a burn chamber within the stove where combustion air is forced through the fire creating a mini furnace. In many pellet stoves, the ignition system is also automatic, increasing the convenience factor.

Easily Installed and Maintained

The power-venting feature of a pellet stove allows for installation almost anywhere in a home. The key to installation is placing the stove near an electrical outlet. All pellet stoves require electricity to operate, although battery packs are available for many stoves just in case the power goes out. Once installed, pellet stoves are easy to maintain. Routine tasks include filling the hopper with pellets, emptying the ash pan weekly, periodic cleaning of the burn pot, hopper, ash traps and glass, and annual professional service of the entire unit before the start of each cold season.

Selecting a Pellet Stove

Much like any other appliance, it is important to spend the time to choose the right pellet stove. Before you make your final decision, visit a specialty retailer in your area for experienced advice. A specialty retailer is a trained pellet stove expert. He or she can arrange for installation by a certified professional installer and provide a resource for where to purchase pellets in your area. Specialty retailers are also the best source of information about how to correctly operate a pellet stove and what is necessary for proper maintenance.

For a list of specialty retailers, visit www.pelletheat.org.

PELLET STOVE CHECKLIST

Information to consider when selecting a pellet stove

TYPE: Pellet stoves are classified by the amount of heat they generate – high versus low output.

SIZE: The physical size of a pellet stove is less important than the heat-generating capacity of the stove and the size of the fuel hopper. A small stove can heat a large space but might not hold more than a day's worth of pellets.

□ LOCATION: Pellet stoves require less installation space than other types of stoves and can be located as little as three inches from a wall, depending on the model. A pellet stove must also be installed a specific distance away from combustible surfaces and materials, such as drapes and doors, and be placed on noncombustible surface such as a hearth pad.

□ VENTING: Since pellet stoves are power vented they can be installed almost anywhere in home, including through the ceiling, through a wall, or into an existing masonry chimney as long as the installation includes at least three feet of vertical chimney. Pellet stove chimneys are unique and are usually three or four inches in diameter. The chimney is also lined with stainless steel.

☐ FEATURES: There are three different types of ignition systems available in pellet stoves: standard (requiring the use of starter gel and a match); self-starting (where the user pushes a button to start the stove or uses a remote control); and fully automatic (where the stove is controlled by a thermostat and cycles on and off depending on the heat level selected). Other optional features include self-cleaning glass, self-cleaning burn pots, and deep pedestal ash pans. Some stove models even have battery back-up systems for when the power goes out (since pellet stoves require electricity to operate).

STYLE: Full bay view doors and windows trimmed in gold or black are examples of the styling options available for pellet stoves. Porcelain or cast iron finishes are also available options with many models of pellet stoves.

■ **INSTALLATION:** To ensure the safe and reliable installation of a pellet stove, the Hearth, Patio & Barbecue Association recommends that people use a specialty retailer and a certified professional installer to perform installation tasks. These professionals will obtain the necessary building permits, make sure that the necessary three feet of vertical chimney is used in the installation and ensure the stove is installed on a hearth pad.

MAINTENANCE: Pellet stoves are simple to maintain, but routine tasks must be performed regularly to ensure proper function. These tasks include emptying

the ash drawer, cleaning the burn pot, hopper, ash traps and glass, and scheduling professional service inspections each year before the start of the cold season. In addition, the HPBA recommends that chimneys and vents be inspected annually (and cleaned as necessary) by a chimney sweep certified by the Chimney Safety Institute of America.

FUEL REQUIREMENTS: Two grades of wood pellet fuel are available for pellet stoves: premium and standard. The difference between the two is their percentage of inorganic ash content. There is significantly less stove maintenance with the use of premium pellet fuel. There are also pellet stoves that can burn pellets with corn, a growing trend in home heating.

■ AVERAGE COST: The price of the appliance itself is only part of the total cost of owning a pellet stove. Other considerations are the cost of the chimney and installation, annual fuel costs and annual maintenance.

COST CHECKLIST:

Pellet Stove	
Chimney	
Installation/Delivery	
Hearth Pad	
Annual Fuel Costs	
Annual Maintenance	

Pellet Stove Benefits

- Helps control home heating bills.
- Lock in annual fuel costs before the cold weather begins.
- Protects the environment.
- Creates an automated wood fire.
- Simple to operate and maintain.
- Installation flexibility in most places in the home.

This information brought to you by this specialty retailer:

Appendix G

Forest Products Services Specialists Job Description

Forest Products Services Specialists

Job Announcement Code	assification Title: / JAC:ob Working Title:FORESTER-ADV 13-04466bo Working Title:FORESTRY SPECIALIST 13-04466Forest Products Services District Specialistpe of Employment:Full Time (40 hrs/week)lary:Starting pay is between \$22.247 and \$33.000 per hour plus excellent benefits. Well qualified candidates will likely earn between \$27.00 and \$30.00 per hour. A six month probationary period is required. This position is in pay
County(ies):	*Statewide
Classification Title: / JAC:	FORESTER-ADV 13-04466
Job Working Title:	Forest Products Services Statewide Specialist
	FORESTRY SPECIALIST 13-04466
	Forest Products Services District Specialist
Type of Employment:	Full Time (40 hrs/week)
<u>Salary</u> :	excellent benefits. Well qualified candidates will likely earn between \$27.00 and \$30.00 per hour. A six month

The Department of Natural Resources is dedicated to the preservation, protection, effective management, and maintenance of Wisconsin's natural resources. The Division of Forestry is seeking four new specialists to grow the Forest Products Services (FPS) Team. This recruitment is for one Statewide Specialist and three District Specialists. Applicants that are interested in one or both of the positions can apply with this exam. If invited to future interviews, candidates will be asked to state which position(s) they are interested in applying for and their office location preference.

plus

The FPS Team provides expert technical assistance, consultation, and technology transfer to a variety of stakeholders including businesses as well as internal and external customers to support and grow Wisconsin's forest products industry.

The District Specialists will be located in field offices around the state. Locations will be determined based on candidate preference, matching a candidates specialized knowledge/experience with the industry needs of a district, and available office space.

The Statewide Specialist can be located in a field office based on candidate preference but the preferred location is in Madison, WI.

Job Duties:

District Specialists (three positions):

The District Specialists develop detailed knowledge of the forest resource and forest products industry within assigned counties. They provide excellent customer service and face-to-face interactions with members of Wisconsin's forest products industry to foster job growth, job retention, and industry expansion. The District Specialists travel frequently to serve multiple counties comprising a geographic region as well as providing statewide support outside their district when needed. They conduct or coordinate manufacturing process efficiency studies or other business process improvement systems and assist forest products companies to improve their competitiveness and market positioning. They compile, interpret and provide roundwood and forest by-product supply information and identify, establish, and develop regional supply chain networks. The District Specialists provide information about wood products, prices, availability and product uses to regional partners and identify, develop, and evaluate regional marketing strategies. They also work to align existing businesses with potential partner groups and opportunities and assist communities and businesses with wood utilization and marketing plans to mitigate the impacts of invasive species. The District Specialists provide technical assistance to the forest industry including the introduction of new technology and manufacturing practices.

Statewide Specialist (one position):

The Statewide Specialist sets the pace for the division through innovation, adaptation, best practices, and transfer of knowledge. This position is a key internal and external consultant for staff, leadership, inter-divisional teams, and partner groups. This position maintains cutting-edge knowledge and expertise by staying abreast of current research and maintaining an effective professional network. The Statewide Specialist coordinates and conducts feasibility studies and reviews business plans and plant designs for new forest product business start-ups and plant expansions. They lead the Timber Product Output Survey and develop, produce, and distribute lists of Wisconsin's primary, secondary, and other forest product industries. The Statewide Specialist is the lead and point of contact for statewide forest products industry supply chains and distribution strategies. They identify prospective businesses by using business directories, following leads from existing clients, participating in organizations, and attending trade shows and conferences. The Statewide Specialist monitors, investigates, and provides expert guidance for new market developments (including export markets). They provide assistance with international trade missions for business development. They assist partners with wood utilization and marketing strategies to mitigate the impacts of invasive species. The Statewide Specialist also collaborates on the development of policy related to emerging issues such as labor availability, transportation, life cycle analysis, ecological services (e.g. carbon markets), renewable energy, woody biomass, and invasive species impacts on wood markets.

Job Knowledge, Skills and Abilities:

~ Solid understanding of the principles and practices of sustainable forest management.

~ Knowledge of forest product raw material resources required of traditional supply chain logistics, production processes, quality control, costs, and other techniques for maximizing the effective manufacture and distribution of goods, including manufacturing process improvement and its application.

Principles and methods for showing, promoting, and selling products or services. This includes marketing strategy and tactics, sales techniques, and sales control systems.
Business and management principles. Economic and accounting principles and practices

with an emphasis on cost accounting, and the analysis and reporting of financial data.

~ Knowledge of ecological services, carbon markets, woody biomass and renewable energy systems and their relationship to forest industry.

- ~ Basic safety practices in the forest products industry.
- ~ General knowledge of wood drying practices.
- ~ Fundamental knowledge of log and lumber grades and wood measurement.
- ~ Data acquisition tools and survey methods.

 \sim Analytic tools including fundamental statistics, relevant software, and database management.

Appendix H

Heating the Midwest – A Midwest Vision for 2025

Heating the Midwest with Renewable Biomass

A Midwest Vision for 2025



Photo Credit: Dennis O'Hara

Key Findings and Outcomes

- Achieve 15% of all thermal energy from renewables by 2025
- Reduce 1.01 billion gallons of propane and 278 million gallons of heating oil
- Reinvest \$2.2 billion into the Midwest economy
- Create 13,170 jobs from the expansion of the thermal biomass industry and up to 210,000 direct, indirect and induced jobs from annual energy savings and the effects of no longer exporting heating fuel money from the region
- Supply **17.2 million green tons** of sustainable woody and agricultural biomass for thermal energy and combined heat and power by 2025
- 12,630,950 homes and businesses are not connected to low-cost natural gas
- Improve air quality, reduce greenhouse gases, and enhance forest management
- Vitalize communities through rural economic opportunities, new industry and innovation

The Vision

We propose that 15% of all thermal energy in the Midwest come from renewable energy sources with 10% derived from sustainably produced biomass by 2025. The remainder of this energy would come from solar thermal and geothermal sources. This shift in our sources for thermal energy will produce extraordinary economic, social and environmental benefits for the Midwest, which currently relies on fossil fuel for 97% of its thermal energy.

Achieve 10% of all thermal energy from biomass by 2025

Strategies and Policies to Achieve the Vision

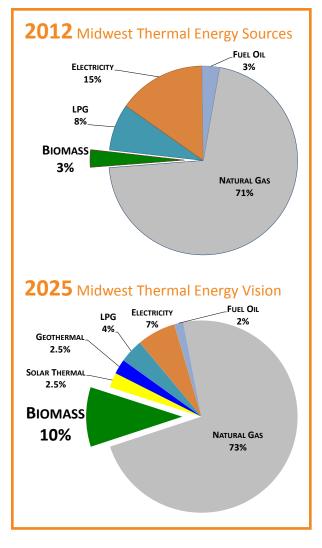
- Increase awareness and recognition of the benefits derived from biomass thermal energy
- Develop clean energy policy that includes clean and efficient biomass thermal energy
- Grow demand for biomass-based thermal fuels and heating systems/CHP in the Midwest
- Support research, technology innovation and demonstration throughout the biomass thermal supply chain
- Expand funding opportunities and programs to support the development and installation of biomass thermal/CHP projects

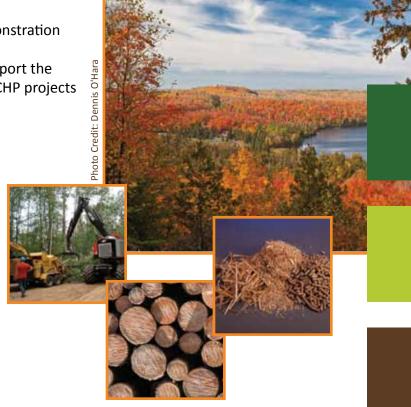
Core Objectives of Clean Energy Policy

- Efficiency and Affordability
- Sustainability
- Clean Emissions and Climate Change Mitigation
- Job Creation

Effective Policy Frameworks

- Financing, Taxes, Grants, Loans
- Carbon Policy
- Sustainability Measures
- Emission and Regulation Enhancements





How Can You Help Achieve the Vision?

- Get Involved!
- Contact Heating the Midwest (*HeatingtheMidwest.org*) or BTEC (*BiomassThermal.org*) to offer feedback, criticism and ideas to improve this Vision
- Share the Vision document with anyone who may be interested. Invite their feedback
- Raise these issues with your governor, state and federal officials, and state legislators
- Join and support one or more of the organizations that have collaborated on this Vision

Funding for this initiative was provided by the sponsors and attendees at the 1st Annual Heating the Midwest with Renewable Biomass conference, held April 25 - 27, 2012 in Eau Claire, WI. We gratefully acknowledge this support.

This vision was developed by Heating the Midwest with Renewable Biomass supported by resource and economic analyses by FutureMetrics, LLC.



Collaborative participation was provided by:



Appendix I

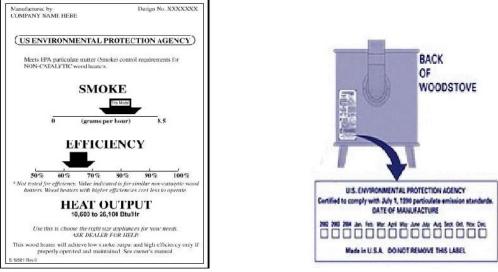
2013 EPA List of Certified Wood Stoves





Enclosed is the list of wood stoves certified by the United States Environmental Protection Agency (EPA). The EPA Certified Wood Stoves list contains information about wood stoves or wood heating appliances that have been certified by the EPA along with its manufacturer name, model name, emission rate (g/hr), heat output (btu/hr), efficiency (actual measured and estimated), and type of appliance. It also indicates whether the appliance is still being manufactured. An EPA certified wood stove or wood heating appliance has been independently tested by an accredited laboratory to determine whether it meets the particulate emissions limit of 7.5* grams per hour for non-catalytic wood stoves and 4.1* grams per hour for catalytic wood stoves. All wood heating appliances that are offered or advertised for sale in the United States are subject to the New Source Performance Standard (NSPS) for New Residential Wood Heaters under the Clean Air Act and are required to meet these emission limits.

An EPA certified wood heater can be identified by a temporary paper label attached to the front of the wood stove and a permanent metal label affixed to the back or side of the wood stove (see examples below). If you have questions regarding a particular model line or manufacturer, please contact Rafael Sanchez at 202-564-7028 or via e-mail at <u>Sanchez.rafael@epa.gov</u>.



^{*} Temporary Wood Stove Label Permanent Wood Stove Label

Wood stoves offered for sale in the state of Washington must meet a particulate emissions limit of 4.5 grams per hour for non catalytic wood stoves and 2.5 grams per hour for catalytic wood stoves.

Out of Productio			Emission	Heat Output	Actual Measured Efficiency (CSA	EPA Estimated (Default)	
n	Manufacturer Name	Model Name	Rate G/Hr	btu/hr	B415.1)	Efficiency	Туре
	A. J. Wells and Sons LTD	Cove 2 SR	4.4	9256 - 32,557		63	Non Catalyt
	Alladin Hearth Products	Sunburst II Model 2208	4.4	11500- 36300		63	Non Catalyt
	American Road Equipment Company	Erik SW II Catalytic Environmentalist SSW-1000	1.2	9800-46900		72	Catalytic
	Amesti LTDA	N380	5.16	10671 - 27842		63	Non Cataly
	Amesti LTDA	Rondo 450	4	11,842-24,288		63	Non Catalyt
	Appalachian Stove & Fabricators, Inc.	Model 32-BW	2.5	10400-24500		72	Catalytic
	Appalachian Stove & Fabricators, Inc.	Model 360-CR	2.8	10600-29100		72	Catalytic
	Appalachian Stove & Fabricators, Inc.	Model 36 BW	3.3	10600-30200		72	Catalytic
	Appalachian Stove & Fabricators, Inc.	Trailmaster Model 4N1-XL II	3.4	10100-26900		72	Catalytic
	Appalachian Stove & Fabricators, Inc.	Model 30-CD	3.7	8500-21400		72	Catalytic
	Appalachian Stove & Fabricators, Inc.	36-BW-1988	3.9	9500-19300		72	Catalytic
	Appalachian Stove & Fabricators, Inc.	32-BW-XL-88, Gemini-XLB 1989	4	8400-19800		72	Catalytic
	Appalachian Stove & Fabricators, Inc.	Model 52 WXL 1988	4.2	10500-15400		72	Catalytic
	Appalachian Stove & Fabricators, Inc.	Heritage Classic A, T16, Cast heat & Catskill	4.4	10,300-31,200		63	Non Cataly
	Appalachian Stove & Fabricators, Inc.	28 CD	4.5	9500-16300		72	Catalytic
	Appalachian Stove & Fabricators, Inc.	Trailmaster 4N1-XL	4.7	9600-19600		72	Catalytic
	Appalachian Stove & Fabricators, Inc.	Heritage Classic; Model Numbers T16 & VT16	6.81	11057-31327		63	Non Cataly
	Archgard Industries, Ltd.	Optima PS1	0.87	10,196-29,581		63	Non Cataly
	Archgard Industries, Ltd.	Chalet 1600 and Chalet 1600 Insert	2.88	10,611-29,181		63	Non Cataly
	Archgard Industries, Ltd.	Chalet 1800	3.62	10,700-35,500		63	Non Cataly
	Austroflamm Industries Inc.	Integra C1121, II	2.7	9300-31100		78	Pellet
	Austroflamm Industries Inc.	Esprit Wood 119.1	6.3	11400-43600		63	Non Cataly
	Austroflamm Industries Inc.	Irony M	6.6	11800-46800		78	Pellet
	Avalon by Travis Industries, Inc.	Spokane 1250	4.4	11600-38500		63	Non Cataly
	Avalon by Travis Industries, Inc	Perfect-Fit insert	4.1	11,300-33,400		63	Non Cataly
	Avalon by Travis Industries, Inc.	Avalon Spokane 1750	1.94	9300-42200		63	Non Cataly
	Avalon by Travis Industries, Inc.	Rainier, Rainier insert	2	11200-40000		63	Non Cataly
	Avalon by Travis Industries, Inc.	Arbor	2.4	10,700-33,900		63	Non Cataly
	Avalon by Travis Industries, Inc.	Olympic, Olympic insert	2.6	12000-45100		63	Non Cataly
	Avalon by Travis Industries, Inc.	Pendleton, Pendleton insert	3	8700-44400		63	Non Cataly
	Barbeques Galore/Pricotech	Rosewood	2.7	11600-36200		63	Non Cataly
	Blaze King Industries, Inc.	Chinook /Sirocco/Ashford 30	0.97	11,200- 27,280	75	72	Catalytic
	Blaze King Industries, Inc.	Blaze King KEJ 1107	1.76	9100-39800	82	72	Catalytic
	Blaze King Industries, Inc.	Blaze King, King Catalytic KEJ-1101	1.9	9000-35300		72	Catalytic
	Blaze King Industries, Inc.	Princess Insert Model PI 1010A	2	7,200-29,500	80	72	Catalytic
	Blaze King Industries, Inc.	Chinook / Sirocco/Ashford 20	1.3	11,400 - 22,700	77	72	Catalytic
	Blaze King Industries, Inc.	Heat Pro C210	2.1	10700-43300		72	Catalytic
	Blaze King Industries, Inc.	Blaze King, King Catalytic Insert KEI-1300	2.2	10100-34500		72	Catalytic
	Blaze King Industries, Inc.	Princess PEJ 1006	2.4	12000-35600	81	72	Catalytic
	Blaze King Industries, Inc.	Blaze King, Auto Light PAL-4000	2.5	12200-33700		78	Pellet
	Blaze King Industries, Inc.	Blaze King, Royal Heir RHT-2200, 2250	2.5	7700-31100		72	Catalytic
	Blaze King Industries, Inc.	Blaze King Princess Insert Model PI 1010	2.8	9,300-31,200	80	72	Catalytic
	Blaze King Industries, Inc.	Heat Pro C110	2.8	9600-32400		72	Catalytic
	Blaze King Industries, Inc.	Blaze King, Royal Heir RHT-2100	3	6800-57100		72	Catalytic
	Blaze King Industries, Inc.	Blaze King PEJ 1003	2.4	10300-41600		72	Catalytic
	Blaze King Industries, Inc.	Briarwood II/90	3.5	10600-36000	71.4	63	Non Cataly
	Blaze King Industries, Inc.	Blaze King, Princess Catalytic PEJ-1002	3.7	8400-35400		72	Catalytic
	Blaze King Industries, Inc.	Blaze King KEJ-1102	3.9	7900-42600		72	Catalytic
	Blaze King Industries, Inc.	Eagle/Pioneer E90, PZ-90, Briarwood XE-90, XEI-90	5.2	13500-38000		63	Non Cataly
	Blaze King of Montana	Blaze King Royal Guardian, RGT-3001	5.8	9400-39800	71.1	63	Non Cataly

					Actual		
					Measured		
Out of					Efficiency	EPA Estimated	
Productio			Emission	Heat Output	(CSA	(Default)	
n	Manufacturer Name	Model Name	Rate G/Hr	btu/hr	B415.1)	Efficiency	Туре
	Boru Stove Company	Carraig Mor BCMUS	3.9	12,878 - 28,846	73.2	63	Non Catalytic
	Bosca Chile S.A. (Ingeniera De Combustion)	Spirit 500, Classic 500	1.2	8,700-21,700		78	Pellet
						70	D # 4
	Bosca Chile S.A. (Ingeniera De Combustion)	Soul Pellet Stove Insert, Soul 700 free standing, Soul 700 Insert	2.2	6,100-30,000		78	Pellet
	Bosca Chile S.A. (Ingeniera De Combustion)	Spirit 550, Limit 450 and Classic 450, Spirit 500	3.6	11,359-26,100		63	Non Catalytic
	Bosca Chile S.A. (Ingeniera De Combustion)	Gold 400	4.4	11,800-26,800		63	Non Catalytic
	Bosca Chile S.A. (Ingeniera De Combustion)	Miner 33	4.3	11,756 - 35,388		63	Non Catalytic
	Ceramiche Savio di Elio & C. s.n.c.	Catellante di Castellante and Real Castillo di Ague Model CS1	5.1	11200-40800		63	Non Catalytic
	Ceramiche Savio di Elio & C. s.n.c.	Real Castelllo di Moncaueri/Castllo Della Venaria	5.6	10100-24200		63	Non Catalytic
	CFM Corporation	DutchWest Large 2479	1.31	11,300-26,500		63	Non Catalytic
	CFM Corporation	DutchWest Small Model	1.41	7,800-25,100		63	Non Catalytic
	CFM Corporation	DutchWest Medium 2478	1.5	10,600-25,300		63	Non Catalytic
	CFM Corporation	Model EWF 36A	2.4	11,300-75,500		72	Catalytic
	CFM Corporation	Vermont Castings Defiant 1610	2.9	10.000-30.000		63	Non Catalytic
	CFM Corporation	EWF 30	3.5	11,100-40,500		63	Non Catalytic
	CFM Corporation	Aspen 1920 & Plymouth HWS10	4.3	9100-18000		63	Non Catalytic
		CW2500X00, CW2500X02, JW2500X00,CJW2500X02,					, , , , , , , , , , , , , , , , , , , ,
	CFM Corporation	DW2500 and JW2500X10	4.7	9500-57800		63	Non Catalytic
	CFM Corporation	FW247001 to FE247004 and JW1000PF1	5	11500-18900		63	Non Catalytic
		Campbell/Jacuzzi CJW2000L02, JW2000L10, DW2000XXX and					,
	CFM Corporation (Jacuzzi Leisure Products, Ir		4.4	12000-55100		63	Non Catalytic
		Campbell/Jacuzzi FW300005-FW300009 & FW300019-					,
	CFM Corporation (Jacuzzi Leisure Products, Ir	nr FW300027,	4.4	12000-55100		63	Non Catalytic
		nc JW1500P10, FW1500, DW1500, JW1500L10	4.4	10300-29200		63	Non Catalytic
	CFM Corporation (Jacuzzi Leisure Products, Ir	nc S27X/S28X & FW27 Series, CJW1500L02	4.4	10300-29200		63	Non Catalytic
	CFM Corporation (Vermont Castings, Inc.)	Defiant Encore	0.6	6200-32900		72	Catalytic
	CFM Corporation (Vermont Castings, Inc.)	Encore 1450 N/C	0.7	10,600-24050		63	Non Catalytic
	CFM Corporation (Vermont Castings, Inc.)	Defiant 1910 & 1945	0.8	10600-44400		72	Catalytic
	CFM Corporation (Vermont Castings, Inc.)	2370	1	5700-18300		72	Catalytic
	CFM Corporation (Vermont Castings, Inc.)	Century/Dutchmaster FW and CDW	1	11,800-32,300		63	Non Catalytic
	CFM Corporation (Vermont Castings, Inc.)	Dutchwest Small Convection Heater #2460	1.1	6600-27300		72	Catalytic
	CFM Corporation (Vermont Castings, Inc.)	Dutchwest Extra Large Convection 2462	1.3	8300-28000		72	Catalytic
	CFM Corporation (Vermont Castings, Inc.)	FA455	1.3	10400-26500		72	Catalytic
	CFM Corporation (Vermont Castings, Inc.)	Dutchwest Large Convection Heater (Model 2461)	1.41	10700-29500		72	Catalytic
	CFM Corporation (Vermont Castings, Inc.)	C.D. Lg. Fed. Convection Heater FA264CCL, FA264CCR	1.6	6600-26700		72	Catalytic
	CFM Corporation (Vermont Castings, Inc.)	Defiant Encore 2550 (Formerly 2190)	1.6	8700-41700		72	Catalytic
	CFM Corporation (Vermont Castings, Inc.)	Defiant Encore 2140	1.8	9000-41300		72	Catalytic
	CFM Corporation (Vermont Castings, Inc.)	Intrepid II Model 1990	2.1	8300-26700		72	Catalytic
	CFM Corporation (Vermont Castings, Inc.)	Model 2170	2.1	9400-22800		72	Catalytic
	CFM Corporation (Vermont Castings, Inc.)	WinterWarm Fireplace Insert Model 1280	2.1	10300-30000		72	Catalytic
	CFM Corporation (Vermont Castings, Inc.)	WinterWarm Small Insert Model 2080	2.1	8700-31100		72	Catalytic
	CFM Corporation (Vermont Castings, Inc.)	FA264	2.2	9500-31700		72	Catalytic
	CFM Corporation (Vermont Castings, Inc.)	Intrepid II Model 2070	2.4	9200-19300		72	Catalytic
	CFM Corporation (Vermont Castings, Inc.)	C.D. Extra-Lg. Federal Convection Heater FA288CCL	2.6	8400-38700		72	Catalytic
	CFM Corporation (Vermont Castings, Inc.)	EWF36	2.7	11,800-68,600		72	Catalytic
	CFM Corporation (Vermont Castings, Inc.)	C.D. Small Federal Convection Heater FA224CCL	2.8	7000-30600		72	Catalytic
	CFM Corporation (Vermont Castings, Inc.)	C.D. Rocky Mountain Heater FA211CL	2.9	6800-27800		72	Catalytic
	CFM Corporation (Vermont Castings, Inc.)	Montpelier	2.9	10,094-27,550		63	Non Catalytic
	CFM Corporation (Vermont Castings, Inc.)	2370	3	10.094-27,550		72	Catalytic

Actual Measured Efficiency - Per CSA B415.1

Default - Category rating assigned by EPA (The estimated efficiency is a follows: 72% (catalyst-equipped), 63% (non-catalyst equipped), and 78% (wood pellets)). § 60.536(i)(3).

Out of Productio			Emission	Heat Output	Actual Measured Efficiency (CSA	(Default)	
	Manufacturer Name	Model Name	Rate G/Hr	btu/hr	B415.1)	Efficiency	Туре
	CFM Corporation (Vermont Castings, Inc.)	FA224	3.1	9100-34800		72	Catalytic
	CFM Corporation (Vermont Castings, Inc.)	FA288	3.1	7800-29300		72	Catalytic
	CFM Corporation (Vermont Castings, Inc.)	Intrepid II 1308	3.1	10200-22500		72	Catalytic
	CFM Corporation (Vermont Castings, Inc.)	Intrepid Model 1640	3.3	8200-19500		63	Non Catalytic
	CFM Corporation (Vermont Castings, Inc.)	Madison Model 1655	3.3	11,300-39,700		63	Non Catalytic
	CFM Corporation (Vermont Castings, Inc.)	Resolute Acclaim (Model Number 2490) & TLWS1	3.4	9500-33900		63	Non Catalytic
	CFM Corporation (Vermont Castings, Inc.)	C.D. Federal "A Plus" FA224ACL	3.5	7200-30000		72	Catalytic
	CFM Corporation (Vermont Castings, Inc.)	C.D. Sequoia FA455	3.6	8700-60300		72	Catalytic
	CFM Corporation (Vermont Castings, Inc.)	C.D. Adirondack Wood Heater FA267CL	3.7	8400-40000		72	Catalytic
	CFM Corporation (Vermont Castings, Inc.)	WinterWarm Small Insert (model 2370)	4	9250-21500		72	Catalytic
	CFM Corporation (Vermont Castings, Inc.)	C.D. Large Federal Box Heater FA209CL	4.3	9000-25600		72	Catalytic
	CFM Corporation (Vermont Castings, Inc.)	C.D. Small Federal Box Heater FA207CL	4.3	6200-28000		72	Catalytic
	CFM Corporation (Vermont Castings, Inc.)	Seville 1635 and 1600 Insert	4.5	9,900-30,800		63	Non Catalytic
	CFM Corporation (Vermont Castings, Inc.)	Resolute Acclaim 0041	5.1	8700-30900		72	Catalytic
	CFM Corporation (Vermont Castings, Inc.)	Madison 1650	5.5	11400-31000		63	Non Catalytic
	CFM Corporation (Vermont Castings, Inc.)	Seville Insert	5.5	10200-27400		63	Non Catalytic
	CFM Corporation (Vermont Castings, Inc.)	Aspen Model 1920	6.3	10100-26400		63	Non Catalytic
	CFM Corporation (Vermont Castings, Inc.)	Seville 1630	6.3	12000-27300		63	Non Catalytic
	Consuming Fire, Inc.	Perfect Hearth	3.4	11,700-38,100		63	Non Catalytic
	Country Flame Technologies, Inc.	R/90	1.5	10600-46800		72	Catalytic
(Country Flame Technologies, Inc.	E-1/90	1.7	9600-37800		72	Catalytic
	Country Flame Technologies, Inc.	B/A	2	10400-55500		72	Catalytic
	Country Flame Technologies, Inc.	0-2	2.5	8000-30000		72	Catalytic
(Country Flame Technologies, Inc.	OV-3000	2.9	11800-34000		63	Non Catalytic
(Country Flame Technologies, Inc.	BBF	3	10500-51400		72	Catalytic
	Country Flame Technologies, Inc.	BBF-6, BBF-I	3	9500-48600		72	Catalytic
	Country Flame Technologies, Inc.	O-2/90	3	10800-34100		72	Catalytic
	Country Flame Technologies, Inc.	E-2	3.3	13000-34400		72	Catalytic
	Country Flame Technologies, Inc.	R-6	3.3	13800-50700		72	Catalytic
<	Country Flame Technologies, Inc.	OV-2600	3.5	11500-33600		63	Non Catalytic
	Country Flame Technologies, Inc.	SBF/A	3.6	8700-33600		72	Catalytic
	Country Flame Technologies, Inc.	E1-6, E1-I	3.7	12400-55300		72	Catalytic
	Country Flame Technologies, Inc.	OV-26BF-I	3.7	11400-41300		63	Non Catalytic
	Country Flame Technologies, Inc.	OV-2100	4.1	11700-32700		63	Non Catalytic
	Country Flame Technologies, Inc.	OV-21	4.2	11700-42200		63	Non Catalytic
	Country Flame Technologies, Inc.	Inglenook INGW-02	4.4	11,600-38,000		63	Non Catalytic
	Country Flame Technologies, Inc.	B-6, B-I	4.6	9600-48200		72	Catalytic
	Country Flame Technologies, Inc.	NC-6D	4.7	11700-54900		63	Non Catalytic
	Country Flame Technologies, Inc.	S-6, S-I	6.5	13100-48900		72	Catalytic
	Country Flame Technologies, Inc.	Patriot	6.9	11300-34000		63	Non Catalytic
	Country Flame Technologies, Inc.	Combo Air OC	7	9300-46400		63	Non Catalytic
	Country Stoves, Inc.	Winslow PS40 and PI40	1.14	7,476-21,343		78	Pellet
	Country Stoves, Inc.	Striker S160 and C160	1.6	12500-41200		63	Non Catalytic
	Country Stoves, Inc.	Canyon S310	3.2	11400-34900		63	Non Catalytic
	Country Stoves, Inc.	Canyon ST310, C310, E310	3.5	11600-38800		63	Non Catalytic
	Country Stoves, Inc.	Alpine	3.53	11,455-42,445		63	Non Catalytic
	Country Stoves, Inc.	Converter C-30, C-35	4	8000-49200		72	Catalytic
	Country Stoves, Inc.	Legacy S260, C260, and E260	4.11	11800-48000		63	Non Catalytic
	Country Stoves, Inc.	Performer S210, SS210, ST210, C210 & E210	4.2	9500-36100		63	Non Catalytic
	Country Stoves, Inc.	T-TOP S 240	4.9	11300-42700		63	Non Catalytic

Out of Productio			Emission	Heat Output	Actual Measured Efficiency (CSA	EPA Estimated (Default)	
n	Manufacturer Name	Model Name	Rate G/Hr	btu/hr	B415.1)	Efficiency	Туре
	Country Stoves, Inc.	C-240 and E-240	5.1	11500-36700		63	Non Catalytic
	Country Stoves, Inc.	STRIKER S130, C-50L, C130, CA-50, CA-50L, CA-55	5.6	9300-43600		63	Non Catalytic
	Country Stoves, Inc.	T-Top C-40, C-45, C-46	5.7	10700-40900		63	Non Catalytic
	Country Stoves, Inc.	Performer S180, C180, E180	6.6	11400-38700		63	Non Catalytic
	Country Stoves, Inc.	Starlite C-20, C-21	9.6	7700-43500		63	Non Catalytic
	Country Stoves, Inc.	Starlite C-20, C-21	9.6	7700-43500		63	Non Catalytic
х	CRD Precision Fabricators Inc. (Chippewa)	Energy King Legacy 2150	2.9	11800-34000		63	Non Catalytic
х	CRD Precision Fabricators Inc. (Chippewa)	Energy King Legacy 2100	3.2	11000-31100		63	Non Catalytic
х	CRD Precision Fabricators Inc. (Chippewa)	Energy King Legacy 1650	3.7	11400-41300		63	Non Catalytic
х	CRD Precision Fabricators Inc. (Chippewa)	Energy King Legacy 950	4.2	11700-42200		63	Non Catalytic
х	CRD Precision Fabricators Inc. (Chippewa)	Energy King Legacy 900	6.5	10200-30800		63	Non Catalytic
х	CRD Precision Fabricators Inc. (Chippewa)	Energy King Legacy 1600	7	11700-23100		63	Non Catalytic
х	Dansons Incorporated	Model HR-2	0.9	10500-33400		78	Pellet
х	Dansons, Incorporated	Eclipse	1	7800-33100		78	Pellet
х	Dell Point Technologies	DC 2000, Europa	0.6	10400-24100		78	Pellet
х	Derco, Inc./Grizzly Stoves	Super Achiever FPI-2-LEX	2.4	9800-34200		72	Catalytic
х	Derco, Inc./Grizzly Stoves	Little Blazer FP-20	4.7	7200-28400		72	Catalytic
х	Derco, Inc./Grizzly Stoves	Little Blazer FP-20	4.7	7200-28400		72	Catalytic
х	Deville	Deville 7794 - Comfort	6.9	11,300-35,100		63	Non Catalytic
х	Dovre, Inc.	Horizon 500 CC	2.9	10300-33800		72	Catalytic
х	Dovre, Inc.	Horizon 500 CC	3.6	8300-28000		72	Catalytic
х	Dovre, Inc.	Heirloom 300 HC	4.5	11600-45100		72	Catalytic
х	Dovre, Incorporated	Heirloom 390	2.8	9100-31800		72	Catalytic
	England's Stove Works, Inc.	25-EP, 55-TRPEP, 55SHPEP	1.43	10,700-25,100		78	Pellet
	England's Stove Works, Inc.	10-CPM, 49-TRCPM, 49-SHCPM	1.6	10,455-24,566		78	Pellet
	England's Stove Works, Inc.	30-NC, 50-TNC30L, 50-TNC30G	1.63	11,950-28,337		63	Non Catalytic
	England's Stove Works, Inc.	Model 18M-H	2	7800-26900		72	Catalytic
	England's Stove Works, Inc.	17-VL	4.3	11,875 - 19238		63	Non Catalytic
	England's Stove Works, Inc.	Summers Heat Model 50-SHW20 Englander Model 24JC	2.1	7200-28600		72	Catalytic
	England's Stove Works, Inc.	Model 18 PC	2.2	8700-26400		72	Catalytic
	England's Stove Works, Inc.	13-NCMH, 50-SNC13,	2.35	11,579-32,017		63	Non Catalytic
	England's Stove Works, Inc.	Englander Freestanding Radiant 24FC	2.4	7200-35600		72	Catalytic
	England's Stove Works, Inc.	Summers Heat Model 50-SHW25 Englander Model 24ICD	2.4	5400-17400		72	Catalytic
	England's Stove Works, Inc.	Englander Front Loading Fireplace 28IC	2.5	8200-24400		72	Catalytic
	England's Stove Works, Inc.	50-TNC Timber Ridge 13-NCI/50-TNC131 (Insert)	2.6	10,000-29,200		63	Non Catalytic
	England's Stove Works, Inc.	Englander 13-NC Summers Heat,50-snc Golden Eagle Englander 25-PDV, Summers Heat 55SHP22, and Timber Ridge	2.6	10,000-29,200		63	Non Catalytic
	England's Stove Works, Inc.	55TRP22 Pellet	2.6	10,700-24,500		78	Pellet
	England's Stove Works, Inc.	Model 24IC	2.6	10200-27100		72	Catalytic
	England's Stove Works, Inc.	24 ACD	2.7	9000-20100		72	Catalytic
	England's Stove Works, Inc.	Englander Front Loading Space Saver 28CC	2.7	7900-25500		72	Catalytic
		Pellet Fuel Burning Room Heater Model 25-PDCV/55-					
	England's Stove Works, Inc.	SHP10/55-TRP10	3.1	8200-22400		78	Pellet
	England's Stove Works, Inc.	Englander Econo Radiant 18PC	3.6	8500-31000		72	Catalytic
	England's Stove Works, Inc.	Summers Heat Model 50-SHW22 Englander Model 24-AC/FC	3.8	9100-25400		72	Catalytic
	England's Stove Works, Inc.	17-VL	4.3	12,791- 43,520		63	Non Catalytic
	England's Stove Works, Inc.	Englander Fireplace Insert 28JC	4.4	8400-29100		72	Catalytic
	England's Stove Works, Inc.	22 PIC	5.1	9000-30200		72	Catalytic
х	Eureka Heating PTY Limited	Emerald	4.4	11000-35500		63	Non Catalytic

Out of Productio			Emission	Heat Output	Actual Measured Efficiency (CSA	EPA Estimated (Default)	
n	Manufacturer Name	Model Name	Rate G/Hr	btu/hr	B415.1)	Efficiency	Туре
х	Evergreen Marketing, Inc.	Mohawk 60A	3.8	4700-14300		72	Catalytic
х	Evergreen Metal Products Inc.	Schrader Pelletmiser 905-P	1	11000-32700		78	Pellet
х	F. Huemer Ges. M.B.H.	Austroflamm Wega II	1.3	8500-42000		78	Pellet
		F1100S, I1100S I1200S, HI200, CS1200, CI1200, CI1250 Small					
	Fireplace Products International Limited	Wood Stove & Insert F2400M, I2400M, S2400, HI300, CC75, CS2400 Medium Wood	3	10600-34700		63	Non Catalytic
	Fireplace Products International Limited	Stove & Insert	3.44	12000- 36800		63	Non Catalytic
	Fireplace Products International Limited	H2100M Hearth Heater	3.5	10800-46900		63	Non Catalytic
	Fireplace Products International Limited	FP90, EX90, R90 Wood Fireplace	3.78	11,700-42,300		63	Non Catalytic
	Fireplace Products International Limited	F1100S, I1100S, F1100S-1 Small Wood Stove & Insert	3.8	09400-38700		63	Non Catalytic
	Fireplace Products International Limited	F2100M, I2100M Medium Wood Stove & insert	3.8	11700-38700		63	Non Catalytic
	Fireplace Products International Limited	F2100MI	3.9	11,300-38,800		63	Non Catalytic
	Fireplace Products International Limited	H200 Cast Wood Stove	3.9	10,900 - 19,400		63	Non Catalytic
	Fireplace Products International Limited	R6,RA6,RA8 Wood Stoves	3.9	11500-59000		63	Non Catalytic
	Fireplace Products International Limited	F3100L, I3100L, S3100L, Large Wood Stove & Insert	4.19	11900-42900		63	Non Catalytic
	Fireplace Products International Limited	H300 Cast Wood Stove	4.2	10,600-28,500		63	Non Catalytic
	Fireplace Products International Limited	R3, RA3, R9 Wood Stove	4.2	11200-35500		63	Non Catalytic
	Fireplace Products International Limited	I2000M14 Wood Insert	4.5	11200-42700		63	Non Catalytic
	Fireplace Products International Limited	R14-2	5	11500-37500		63	Non Catalytic
	Fireplace Products International Limited	Z2500L Wood Fireplace	5.2	10600-39700		63	Non Catalytic
	Fireplace Products International Limited	R-16 Wood Insert	6.6	11100-32900		63	Non Catalytic
	Fireplace Products International Limited	F2000M Medium Wood Stove	7.1	11800-34200		63	Non Catalytic
	Fireplace Products International Limited	R7, RA7, R5 Small Wood Stove	8.3	5900-33500		63	Non Catalytic
	Fireplace Products International Limited	F5100	1.46	11,738 - 41,982	79.08	72	Catalytic
	Fireplace Products International Limited	GF55, GFI55 Regency Greenfire Pellet Stove & Insert	1.96	6,500-40,000		78	Pellet
	Fireplace Products International Limited	GC60, GCI60 Hampton Cast Pellet Stove & Insert	2	9,363 - 45,478		78	Pellet
	Fireplace Xtrodinair (FPX) by Travis Industries.		2.3	11900-47100		72	Catalytic
	Fireplace Xtrodinair (FPX) by Travis Industries		2.5	11000-45300		72	Catalytic
	Fireplace Xtrodinair (FPX) by Travis Industries,		4.1	11,300-33,400		63	Non Catalytic
	Foundries du Lion S.A.	Efel Symphony 390.74	1.8	10700-33000		72	Catalytic
	Foundries du Lion S.A.	Harmony IIIB	2.7	11.200-57.300		63	Non Catalytic
	Foundries du Lion S.A.	Model S-33,S-83,H33,R33,X33	3.3	8,600-37,300		63	Non Catalytic
	Foundries du Lion S.A.	Efel Harmony 386.75	3.8	7100-51000		72	Catalytic
	Foundries du Lion S.A.	Harmony I	4.4	11800-55000		63	Non Catalytic
	Foundries du Lion S.A.	Efel Symphony 387.74	5.1	10600-49700		72	Catalytic
	Fovers Supreme Incorporated	Supreme Plus	7	9,600-16,300		63	Non Catalytic
	Foyers Supreme Incorporated	Volcano Plus	4.3	11,310-25,189		63	Non Catalytic
	Foyers Supreme Incorporated	Galaxy	3.5	12,833 - 27,093		63	Non Catalytic
	Foyers Supreme Incorporated	Superme 2 Face Plus, Opus	5	10,213-30,163		63	Non Catalytic
х	Frantech. Inc.	Seefire 2100 S	3.2	11000-31100		63	Non Catalytic
x	Frantech, Inc.	Seefire 900 S	6.5	10200-30800		63	Non Catalytic
x	Frantech, Inc.	Seefire 1600 S	7	11700-23100		63	Non Catalytic
~		Pleasant Hearth HWS-224172MH-B; Pleasant Hearth HWS- 224172MH-BCA				63	-
	GHP Group	Pleasant Hearth LWS-127201-B; Pleasant Hearth LWS-127201-	5.1	11,638 - 22,444			Non Catalytic
	GHP Group	BCA Pleasant Hearth LWS-130291-B; Pleasant Hearth LWS-130291-	4.3	9,238 - 16,744		63	Non Catalytic
	GHP Group	BCA	3.6	12,084 - 37580		63	Non Catalytic
х	Gibraltar Stoves, Inc.	LCC, MCC, SCC, CFS, CFI & DDI	2.75	8400-28700		72	Catalytic
x	GLG Australia	Pearl Bay	3.8	11,300-35,300		63	Non Catalytic

ıt of oductio			Emission	Heat Output	Actual Measured Efficiency (CSA	EPA Estimated (Default)	
	Manufacturer Name	Model Name	Rate G/Hr	btu/hr	B415.1)	Efficiency	Туре
	Glo King/Pierce Engineered Products Inc.	GK 100 HT	3.2	10600-61400		63	Non Catalyt
	Glo King/Pierce Engineered Products Inc.	GK-500HT	6.4	10000-22400		63	Non Catalyt
	Glo King/Pierce Engineered Products Inc.	400HT	7	10000-40200		63	Non Cataly
	Glo King/Pierce Engineered Products Inc.	GK-300HT	7	11000-31000		63	Non Cataly
	Glow Boy	Model HR-2	0.9	10500-33400		78	Pellet
	Godin Imports, Inc.	Nouvelle Epoque 3137	3.9	10500-20700		72	Catalytic
	Gruppo Piazzetta S.P.A.	P960, P961, P962	1.98	10,000 - 38,500		78	Pellet
	Gruppo Piazzetta S.P.A.	P955, P956, and P957	2.28	9,000 - 29,700		78	Pellet
	Gruppo Piazzetta S.P.A.	Model 905	6.8	11600-30300		63	Non Cataly
	Gruppo Piazzetta S.P.A.	Sabrina, Sveva, Samanta, Siria	2.305	9,912 - 37,169		78	Pellet
	Gruppo Piazzetta S.P.A.	Monia, Marcella, Marcella, Mia, Maira	2.15	9,912 - 37,169		78	Pellet
	Gruppo Piazzetta S.P.A.	904	7.5	6700-28300		63	Non Cataly
	H.M.F. Forlong and Maisey Ltd.	Merlin "3", M 3000	6.1	12300-37000		63	Non Cataly
	Hajduk	Prima MR-51	3.8	11,636-35,246		63	Non Cataly
	Harman Stove Company	TL 2.0	2.6	9,619 - 31,825		63	
	Harman Stove Company	TL 2.6	3.7	11,281 - 32,657		63	Non Cataly
	Harman Stove Company	TL 300	1.1	11,238-34921		63	Non Cataly
	Harman Stove Company	Invincible RS	1.53	6200-32800		78	Pellet
	Harman Stove Company	Oakwood	2.3	10,900-30,500		63	Non Cataly
	Harman Stove Company	Treemont TAC-340C	2.8	7400-33800		72	Catalytic
	Harman Stove Company	CW30	3.6	10000-34000		63	Non Cataly
	Harman Stove Company	Treemont TAC-260C, TAC-260CF	3.9	8400-40700		72	Catalytic
	Harman Stove Company	Model Exception TL200	4.4	11000-42400		63	Non Cataly
	Harman Stove Company	Treemont TAC-520C	5.2	12000-37300		72	Catalytic
	Hase Kaminofenbau	Lima 8150	3.57	11,805-31,653		63	Non Cataly
	Hase Kaminofenbau	Bari, Lima	3.57	11,805-31,653		63	Non Cataly
	Hawke Manufacturing Company, Inc.	HMI 28II	2.6	6100-39600		72	Catalytic
	Hearth and Home Technologies	5100I ACC	4.2	10,491 - 27,854		63	Non Cataly
	Hearth and Home Technologies	4100I ACC	4.3	11696 - 25,925		63	Non Cataly
	Hearth and Home Technologies	Quadra-Fire 3100 ACC	1.1	11900-43200		63	Non Cataly
	Hearth and Home Technologies	Quadra Fire 4300 ACT	1.2	11900-58500		63	Non Cataly
	Hearth and Home Technologies	Quadra-Fire 3100 ACT & 3100I ACT	1.3	11400-46900		63	Non Cataly
	Hearth and Home Technologies	Quadra-Fire 5100 I ACT B	2	11,900-50,600		63	Non Cataly
	Hearth and Home Technologies	2100 ACC	2.1	12000-28000		63	Non Cataly
	Hearth and Home Technologies	Quadra-Fire 3100F, 3100 I	2.1	11900-43200		63	Non Cataly
	Hearth and Home Technologies	Quadra-Fire 4300	2.1	11900-39900		63	Non Cataly
	Hearth and Home Technologies	Quadra-Fire 1900	2.2	11500-32200		63	Non Cataly
	Hearth and Home Technologies	Quadra-Fire Cape Cod	2.2	11500-43000		63	Non Cataly
	Hearth and Home Technologies	Quadra-Fire 5100-I Fireplace Insert	2.7	11800-49900		63	Non Cataly
	Hearth and Home Technologies	Yosemite	2.7	10900-28600		63	Non Cataly
	Hearth and Home Technologies	Quadra-Fire Isle Royale	2.9	10400-46800		63	Non Cataly
	Hearth and Home Technologies	Arrow 55	3	9900-37500		72	Catalytic
	Hearth and Home Technologies	Quadra-Fire 7100	3.1	13,800-67,300		63	Non Cataly
	Hearth and Home Technologies	Heat N Glo Number FT-300	3.3	10,000-41,000		63	Non Cataly
	Hearth and Home Technologies	Northstar/Constitution	3.3	11,300-51,200		63	Non Cataly
	Hearth and Home Technologies	Quadra-Fire Cumberland Gap	3.4	11,200-44,300		63	Non Cataly
	Hearth and Home Technologies	Quadra-Fire 2100, 2100 I	3.6	9300-39300		63	Non Cataly
	Hearth and Home Technologies	Arrow S12 (Stove) & I12 (Insert)	3.7	9900-32100		63	Non Cataly
	Hearth and Home Technologies	Heat-N-Glo FT-210	3.9	9,800-36,600		63	Non Cataly
	Hearth and Home Technologies	Arrow 14, 20	4	14000-36100		63	Non Cataly

ut of roductio			Emission	Heat Output	Actual Measured Efficiency (CSA	EPA Estimated (Default)	
	Manufacturer Name	Model Name	Rate G/Hr	btu/hr	B415.1)	Efficiency	Туре
	Hearth and Home Technologies	Quadra-Fire 4100	4	11700-50500		63	Non Cataly
	Hearth and Home Technologies	S-22 & S-221	4	12000-36900		63	Non Cataly
	Hearth and Home Technologies	5700 ACT/ Step Top	4.2	11800-45900		63	Non Cataly
	Hearth and Home Technologies	Model 2700I	4.2	11200-35900		63	Non Cataly
	Hearth and Home Technologies	Arrow S32 & I32	4.24	10800-47500		63	Non Cataly
	Hearth and Home Technologies	Arrow Fireplace Insert 25	4.7	11300-55000		72	Catalytic
	Hearth and Home Technologies	Heatilator 11, 12	5.1	12400-36100		63	Non Cataly
	Hearth and Home Technologies	Quadra-Fire 1800	5.1	10600-31300		63	Non Cataly
	Hearth and Home Technologies	S10 and I10 Heatilator 1190/Arrow 1490(S20) Heatilator 1290/Arrow	5.9	11200-40600		63	Non Cataly
	Hearth and Home Technologies	2090(120)	6.1	10500-44500		63	Non Cataly
	Hearth and Home Technologies	Quadra-Fire 2000, 2000-I	6.1	7400-43700		63	Non Cataly
	Hearth and Home Technologies	Quadra-Fire 3000F, 3000 I	6.5	9000-44700		63	Non Cataly
	Hearth and Home Technologies	Arrow 18	7.2	14500-34400		63	Non Cataly
	Hearth and Home Technologies	4300ACC	1.1	11,842-38,305		63	Non Cataly
	Hearth and Home Technologies	Heatilator ECO ADV WS22	2.7	11,733 - 26,957		63	Non Cataly
	Hearth and Home Technologies	Quadra Fire 5700 ACC	2.3	11,17 - 40,359		63	Non Cataly
	Hearth and Home Technologies	Voyageur	4.12	11,163 - 23,513		63	Non Cataly
	Hearth and Home Technologies	Quadra Fire 2100 Millinnium & 2100 ACT	2	10900- 37200		63	Non Cataly
	Hearth and Home Technologies	Summit Insert	3.15	10,732 - 25,578		63	Non Catal
	Hearth and Home Technologies	Model 400	2.9	8700-2200		63	Non Cataly
	Hearth and Home Technologies	Quadra-Fire Model 4100I and Bodega Bay	3.1	9,000-41,800		63	Non Catal
	Hearth and Home Technologies	Model 2590	3.8	9900-34300		72	Catalytic
	Hearth and Home Technologies	Aurora Model 700	4.3	11800-30900		63	Non Cataly
	Hearth and Home Technologies	Quadra-Fire 1800 I	4.9	10000-33200		63	Non Cataly
	Hearth and Home Technologies	PH35PS	0.28	9,555 - 25,081		78	Pellet
	Hearth and Home Technologies	PH50PS	0.74	9,256 - 32,396		78	Pellet
	Hearth and Home Technologies	Heatilator ECO ADV WS18	2.6	10,925 -22,563		63	Non Cataly
	Hearthstone Quality Home Heating Prod		1.9	10500-33600		63	Non Cataly
	Hearthstone Quality Home Heating Prod		2.1	11,800-32,400		63	Non Catal
	Hearthstone Quality Home Heating Prod		2.1	11,800-32,400		63	Non Catal
	Hearthstone Quality Home Heating Prod		1.3	15,320 - 31,200		78	Pellet
	Hearthstone Quality Home Heating Prod		2.3	10700-29400		63	Non Catal
	Hearthstone Quality Home Heating Prod		2.4	10500-41500		63	Non Catal
	Hearthstone Quality Home Heating Prod		2.55	11,455 - 29,301		63	Non Catal
	Hearthstone Quality Home Heating Prod	U	2.7	11,700-32,800		63	Non Cataly
	Hearthstone Quality Home Heating Prod		3	10,600-28,300		63	Non Cataly
	Hearthstone Quality Home Heating Prod	,	3.08	10,973-25,563		63	Non Cataly
	Hearthstone Quality Home Heating Prod	•	3.08	10,973-25,563		63	Non Catal
	Hearthstone Quality Home Heating Prod		3.1	11,900-33,100		63	Non Cataly
	Hearthstone Quality Home Heating Prod	•	3.1	12,000-37,900		63	Non Cataly
	Hearthstone Quality Home Heating Prod		3.6	11900-32600		63	Non Cataly
	Hearthstone Quality Home Heating Prod		3.6	9200-25400		63	Non Cataly
	Hearthstone Quality Home Heating Prod		2.9	11,370 -28, 940		63	Non Cataly
	Hearthstone Quality Home Heating Prod		2.9	11,370 -28, 940		63	Non Cataly
	Hearthstone Quality Home Heating Prod		4.3	10500-29300		63	Non Cataly
	Hearthstone Quality Home Heating Prod	ucts In Castleton	2.71	11,395 - 24,569		63	Non Cataly
	Hearthstone Quality Home Heating Prod	ucts In Manchester 8360	3.01	11,335 - 47,509		63	Non Cataly
	Heat Tech Industries	No. 26 GM	4	11300-35800		63	Non Cataly
	Heatilator, Inc.	Heatilator LE	4.46	11500-44400		63	Non Catal

Out of Productio			Emission	Heat Output	Actual Measured Efficiency (CSA	EPA Estimated (Default)	
n	Manufacturer Name	Model Name	Rate G/Hr	btu/hr	B415.1)	Efficiency	Туре
х	Heatilator, Inc.	1890(S30)	5.7	11200-42700		78	Pellet
х	Heating Energy Systems, Inc.	Trailblazer Genesis 1600/1800	3	11400-36400		63	Non Catalytic
х	Heating Energy Systems, Inc.	Trailblazer Genesis 2000-C	3.1	10600-37500		72	Catalytic
х	Heating Energy Systems, Inc.	Trailblazer Classic 1300/1306	3.2	11300-32400		72	Catalytic
х	Heating Energy Systems, Inc.	Trailblazer 1700/1706	4.6	11000-32400		63	Non Catalytic
х	Heating Energy Systems, Inc.	Trailblazer Classic 1500/1700	4.9	9500-36600		63	Non Catalytic
х	Heating Energy Systems, Inc.	Trailblazer Genesis 1600, Classic 1500	8.2	12100-28100		63	Non Catalytic
х	Heat-N-Glo Fireplace Products, Inc.	CBS-41	3.9	10000-30300		63	Non Catalytic
х	HeatWorx LLC	Independence	3.6	11,370 - 34,260		63	Non Catalytic
	Henan Hi-Flame	Horse Flame 737	4.9	11,200 - 37,500		63	Non Catalytic
	Henan Hi-Flame	Hi-Flame	4.9	10,500 - 30,501		63	Non Catalytic
х	Heritage Stoves Inc.	Bostonian 2500 C (Insert)	3.8	10600-22300		72	Catalytic
х	Heritage Stoves Inc.	American 2000C	5.5	13600-33800		72	Catalytic
х	Heritage Stoves Inc.	Bostonian 2500C	6.8	9600-37300		72	Catalytic
	Hestia Heating Products	Model HHP 1	2.89	7,900-30,200		78	Pellet
	Hestia Heating Products	Model HHP 2	4.1	12,084-25,496		78	Pellet
	High Energy Manufacturing, Limited	J1000 Pellet Stove	2.1	13,000 - 21,800		78	Pellet
	High Sierra Stoves, Ltd.	Evolution 8000TE	2.2	7900-40500		72	Catalytic
	High Sierra Stoves, Ltd.	Ambassador 4700TE	2.5	10100-37600		72	Catalytic
	High Sierra Stoves, Ltd.	Sweet Home Catalytic Fir AK-18	3.1	8800-29500		72	Catalytic
	High Sierra Stoves, Ltd.	Cricket MHCR 5200	3.5	6800-27600		72	Catalytic
	High Sierra Stoves, Ltd.	Evolution 7000TE.7000C	4	11200-43000		72	Catalytic
	High Sierra Stoves, Ltd.	Sweet Home Solitaire PFA 2000	4	9700-28200		78	Pellet
	High Sierra Stoves, Ltd.	Diplomat 4300 TE	5.1	10400-53400		72	Catalytic
	High Sierra Stoves, Ltd.	Sierra Classic 1500B	6.9	8600-34700		63	Non Catalytic
	High Sierra Stoves, Ltd.	Sweet Home NFX-HT	7.8	14500-33200		63	Non Catalytic
x	High Valley Construction & Maintenance Corp.		2.7	11800-40400		63	Non Catalytic
x	High Valley Construction & Maintenance Corp.		3.1	7700-40900		72	Catalytic
x	High Valley Construction & Maintenance Corp.	High Valley Model 1500	3.4	9400-34200		72	Catalytic
x	High Valley Construction & Maintenance Corp.	High Valley 2000, Craft Stove 2000	3.3	10800-43100		72	Catalytic
~	Hijos de Bartolome Fajardo S.L.	Ronda	6.6	10,978 - 29,301		63	Non Catalytic
	Hijos de Bartolome Fajardo S.L.	Antartida	5.5	11938 - 34,245		63	Non Catalytic
	Hijos de Bandoonie Pajardo S.L. Hi-Teck Stoves	Hi Teck H 2000C	3.6	12600-41400		72	Catalytic
	Hitzer, Inc.		6.4	12000-22400		63	Non Catalytic
	Hitzer, Inc.	Glo King 500SD Glo King 300HT	0.4 7	11000-22400		63	Non Catalytic
	Hitzer, Inc.	Glo King 400HT	7	10000-40200		63	Non Catalytic
	Horizon Research Inc.	Model HR-2	0.9	10500-33400		63 78	Pellet
x						78 78	Pellet
x	Horizon Research Inc.	Eclipse	1	7800-33100			
х	Horizon Research Inc.	Eclipse	1	7800-33100		78	Pellet
	Horse Flame Metal USA, Inc.	517 HF	3.6	8.585-24,358		63	Non Catalytic
	Horse Flame Metal USA, Inc.	717 HF	6.6	11,400-28,857		63	Non Catalytic
	Horse Flame Metal USA, Inc.	HF577DU	6.8	10,754-43,138		63	Non Catalytic
	Horse Flame Metal USA, Inc.	917HF, HF917UA	7.2	11842-30330		63	Non Catalytic
	Hudson River Stove Works	HR1-M, Hudson River Medium	7	11,900-19,700		63	Non Catalytic
	Hussong Manufacturin Company, Inc. (Kozy He		2.5	8,100-21,400		63	Non Catalytic
	Hussong Manufacturing Company, Inc.	Kozy Heat Z 42	3.3	11500-35100		63	Non Catalytic
х	Hutch Manufacturing Company	DWI-42C-2 (EPA)	1.5	10700-52800		72	Catalytic
х	Hutch Manufacturing Company	DWI-42C	1.6	9800-54600		72	Catalytic
х	Hutch Manufacturing Company	HRD-27C Catalytic Freestanding	2.5	10300-56200		72	Catalytic
х	Hutch Manufacturing Company	HRS-18C Small Freestanding	2.9	10300-38400		72	Catalytic

Out of Productio			Emission	Heat Output	Actual Measured Efficiency (CSA	EPA Estimated (Default)	
n	Manufacturer Name	Model Name	Rate G/Hr	btu/hr	B415.1)	Efficiency	Туре
х	Hutch Manufacturing Company	HRD-18C	4.5	9300-39100		72	Catalytic
	HWAM Heat Design A/S	Monet	3.4	10,996-26,221		63	Non Catalytic
	HWAM Heat Design A/S	3055	4.09	10,996-26,221		63	Non Catalytic
	J. A. Roby	Mystere	6	12,900-24,200		63	Non Catalytic
	J. A. Roby	Vulcain	6.09	9,50129180		63	Non Catalytic
	J. A. Roby	Atmosphere	6.9	9,043 - 28,675		63	Non Catalytic
	J. A. Roby	Evolution	6.9	9,043 - 28,675		63	Non Catalytic
	J. A. Roby	Ultimate	7.1	9,50129180		63	Non Catalytic
х	Jacuzzi Leisure Products, Inc.	Gordon Elite S18XE	3	11300-31200		63	Non Catalytic
х	Jacuzzi Leisure Products, Inc.	Fraser Elite I, S407E, S408E, S409E	3.4	10000-37900		63	Non Catalytic
х	Jacuzzi Leisure Products. Inc.	Cabot Elite S17XE	4.5	11300-34400		63	Non Catalytic
x	Jacuzzi Leisure Products, Inc.	Campbell Elite S14XE	5.1	11000-31100		63	Non Catalytic
x	Jacuzzi Leisure Products, Inc.	JW1000L10, JW1000P10, DW1000, FW2400, S24	5.3	10600-26100		63	Non Catalytic
		3111000210, 3111000110, D111000, 1112400, 024	0.0	10000-20100		05	Non Catalytic
х	Jacuzzi Leisure Products, Inc.	Model Campbell II Elite S-24X & FW24 Series, CJW1000L02,	5.3	10600-26100		63	Non Catalytic
х	Jacuzzi Leisure Products, Inc.	Douglas Elite S131E, S132E; Mini Elite S111E,S112E	7.1	10400-22200		63	Non Catalytic
х	Jayline Heating Ltd.	Amzed Jayline Ukal U-12	2.9	9900-28200		63	Non Catalytic
х	Jayline Heating Ltd.	AMZED JAYLINE 1B AND FS	5.4	9500-40400		63	Non Catalytic
	Jotul North America (Jotul U.S.A., Inc.)	F602 CB	3.4	11,998 - 47,713	70.7	63	Non Catalytic
	Jotul North America (Jotul U.S.A., Inc.)	Firelight 12	2.4	10500-32100		72	Catalytic
	Jotul North America (Jotul U.S.A., Inc.)	F370	2.58	10,978-29,048		63	Non Catalytic
	Jotul North America (Jotul U.S.A., Inc.)	F100 Nordic QT	3	7,700-27,400		63	Non Catalytic
	Jotul North America (Jotul U.S.A., Inc.)	Jotul Oslo F-500	3	10900-35000		63	Non Catalytic
	Jotul North America (Jotul U.S.A., Inc.)	Alpha 350132	3.1	10100-33000		72	Catalytic
	Jotul North America (Jotul U.S.A., Inc.)	Model Series 8	3.1	12600-33000		72	Catalytic
	Jotul North America (Jotul U.S.A., Inc.)	F500	3.2	12000-34700		63	Non Catalytic
	Jotul North America (Jotul U.S.A., Inc.)	F118 CB	3.5	12,000-23,500		63	Non Catalytic
	Jotul North America (Jotul U.S.A., Inc.)	Model 3 TDIC-2	3.6	10900-30600		72	Catalytic
	Jotul North America (Jotul U.S.A., Inc.)	Castine F400	3.8	11300-27800		63	Non Catalytic
	Jotul North America (Jotul U.S.A., Inc.)	F3CBI	3.8	11400-43500		63	Non Catalytic
	Jotul North America (Jotul U.S.A., Inc.)	Model 8 TDIC	3.8	10900-35100		72	Catalytic
	Jotul North America (Jotul U.S.A., Inc.)	American Fireplace Stove 3TDC	4	8800-31700		72	Catalytic
		Model C350	4	11,500-34,200		63	Non Catalytic
	Jotul North America (Jotul U.S.A., Inc.)	Jotul F600	4.1	11,600-32,500		63	Non Catalytic
	Jotul North America (Jotul U.S.A., Inc.)		4.1	, ,		63	,
	Jotul North America (Jotul U.S.A., Inc.)	Firelight 12CB		13500-45900			Non Catalytic
	Jotul North America (Jotul U.S.A., Inc.)	C450, Tamarack	4.42	11,900-36,100		63	Non Catalytic
	Jotul North America (Jotul U.S.A., Inc.)	C550 CB	4.47	11,696-35933		63	Non Catalytic
	Jotul North America (Jotul U.S.A., Inc.)	Jotul Petite	4.52	10500-39900		63	Non Catalytic
	Jotul North America (Jotul U.S.A., Inc.)	Jotul Model 602 CB Classic	5.2	9700-42100		63	Non Catalytic
	Jotul North America (Jotul U.S.A., Inc.)	Model 3 CB	5.8	11900-58300		63	Non Catalytic
	Jotul North America (Jotul U.S.A., Inc.)	C550	7.14	12,034-36,669		63	Non Catalytic
	Jotul North America (Jotul U.S.A., Inc.)	F55	3.5	11,576 - 30,399		63	Non Catalytic
	Jotul North America (Jotul U.S.A., Inc.)	F45	2.31	11,576 -26,528		63	Non Catalytic
	Jotul North America (Jotul U.S.A., Inc.)	50TL	2.84	11,696 - 32,919		63	Non Catalytic
	JR Home Heating Products	WPS 30 Trendline, Soft Line, Fine Line, Zeus, Athene, Troja, Hera,	4.5	12,791 - 43,520		78	Pellet
	Jydepejsan A/S	Avanti	3.9	11300- 28100		63	Non Catalytic
	Jydepejsan A/S	H530	6.8	11,100-28,800		63	Non Catalytic
	Kalvin International and Company (HK)	KWS1-M	7	11,900-19,700		63	Non Catalytic
			1	11,300-13,700		00	Non Galaytic

Out of Productio			Emission	Heat Output	Actual Measured Efficiency (CSA	EPA Estimated (Default)	
١	Manufacturer Name	Model Name	Rate G/Hr	btu/hr	B415.1)	Efficiency	Туре
(Kent Heating Limited	Catalytic Tile Fire	2	5900-24500		72	Catalytic
(Kent Heating Limited	Ultima 2000S	4.5	11000-23000		63	Non Catalytic
	Kent Heating Limited	Log Fire LPE	5.9	8900-28200		63	Non Catalytic
	Kent Heating Limited	Tile Fire L.E.M. TLE-1	5.9	8500-38600		63	Non Catalytic
	Kent Heating Limited	Tile Fire 2000, Ultima 2000	6.3	12500-21700		63	Non Catalytic
	Kent Heating Limited	Sherwood L.E.M. XLE-1	6.5	9600-33400		63	Non Catalytic
	Kent Heating Limited	Log Fire 2000	7	11200-23700		63	Non Catalytic
	Kent Heating Limited	Sherwood 2000	8.1	13000-26600		63	Non Catalytic
	Krog Iversen & Co. A/S	DSA 4	1.1	10,500-27,900		63	Non Catalytic
	Krog Iversen & Co. A/S	Basic 1 & 3	2.17	10032-17906		63	Non Catalytic
	Krog Iversen & Co. A/S	Basic 4	2.2	10000-22100		63	Non Catalytic
	Krog Iversen & Co. A/S	Andersen 8	2.9	11900-30100		63	Non Catalytic
	Krog Iversen & Co. A/S	Scan 24	2.9	11300-22500		63	Non Catalytic
	Krog Iversen & Co. A/S	Scan 47.2	3.1	10400 - 30900		63	Non Catalytic
	Krog Iversen & Co. A/S	Scan 4.5	3.3	9,500-31,000		63	Non Catalytic
	Krog Iversen & Co. A/S	Andersen 8.2	3.5	7,600-28,800		63	Non Catalytic
	Krog Iversen & Co. A/S	Scan 60	3.97	8,700-27,430		63	Non Catalytic
	Krog Iversen & Co. A/S	Scan 5.2	4.2	11800-26500		63	Non Catalytic
	Krog Iversen & Co. A/S	Scan 10-A	4.4	11,600-37,700		63	Non Catalytic
	Krog Iversen & Co. A/S	Model Scan 61	4.5	10,600-29,300		63	Non Catalytic
	Krog Iversen & Co. A/S	Scan 20	5.1	9900-19000		63	Non Catalytic
	Kuma Stove And Iron Works	Aspen	4.1	11,689 - 24206		63	Non Catalytic
	Kuma Stove And Iron Works	Model Kuma 100/300/400	2.2	10100-52100		72	Catalytic
	Kuma Stove And Iron Works	Kuma K-300/K-400, K-100B	2.8	12100-65200		72	Catalytic
	Kuma Stove and Iron Works	Kuma Wood Classic Model HT-2	3.2	11300-48000		63	Non Catalytic
	Kuma Stove and Iron Works	Ashwood	3.3	11300-48000		63	Non Catalytic
	Kuma Stove And Iron Works	Tamarack	3.3	11300 -48000	73.5	63	Non Catalytic
	Kuma Stove And Iron Works	KTAM	4.42	11708 -24418		63	Non Catalytic
	Kuma Stove And Iron Works	Kuma Scott HT-1	3.5	11700-29800		63	Non Catalytic
	Lennox Hearth Products	Whitfield Fireplace/Hearth Stove	1	11000-35700		78	Pellet
	Lennox Hearth Products	Whitfield WP-1, III T, II-T, II-TC, Advantage Series	1	9100-37800		78	Pellet
	Lennox Hearth Products	WP-2 III T, II-TC, Advantage Series	1	9100-37800		78	Pellet
	Lennox Hearth Products	BELLA	1.01	11,202-25,925		78	Pellet
	Lennox Hearth Products	WINSLOW PS40 and PI40	1.14	7,476-21,343		78	Pellet
	Lennox Hearth Products	Whitfield Advantage WP-2	1.3	10900-35100		78	Pellet
	Lennox Hearth Products	STRIKER S160 and C160	1.6	12500-41200		63	Non Catalytic
	Lennox Hearth Products	Bayview II, 2000C, BV4000C, BV4000C-2	1.9	6600-40900		72	Catalytic
		Traditions T300HT & T3000HT The Earth Stove 1600HT,					
	Lennox Hearth Products	1900HT-M	2.6	10700-37400		63	Non Catalytic
	Lennox Hearth Products	Bayview BV450C/BV400C-2	3	11000-48100		72	Catalytic
	Lennox Hearth Products	Bayview II BV4000	3.1	9200-42300		72	Catalytic
	Lennox Hearth Products	Model T200C	3.2	8500-34900		72	Catalytic
	Lennox Hearth Products	CANYON ST310, C310	3.5	11600-38800		63	Non Catalytic
	Lennox Hearth Products	1003-C	3.7	11700-36800		72	Catalytic
	Lennox Hearth Products	Traditions T-100	3.8	8300-43800		72	Catalytic
	Lennox Hearth Products	MONTAGE	4.03	6,270-29,784		78	Pellet
	Lennox Hearth Products	Traditions T150C, T100SC	4.1	6500-35300		72	Catalytic
	Lennox Hearth Products	LEGACY S260, C260, and E260	4.11	11800-48000		63	Non Catalytic
	Lennox Hearth Products	PERFORMER SS210, ST210 and C210	4.2	9500-36100		63	Non Catalytic
	Lennox Hearth Products	2800HT	4.5	11500-46700		63	Non Catalytic

Dut of Productio			Emission	Heat Output	Actual Measured Efficiency (CSA	EPA Estimated (Default)	
١	Manufacturer Name	Model Name	Rate G/Hr	btu/hr	B415.1)	Efficiency	Туре
	Lennox Hearth Products	Brass Flame KS-805	5.3	9300-49800		63	Non Catalytic
	Lennox Hearth Products	Bayview BV400, BV450	5.5	11000-53700		72	Catalytic
	Lennox Hearth Products	Brass Flame KS-1005, KS-2000I	6	11800-44000		63	Non Catalytic
	Lennox Hearth Products	Brass Flame KS-805	6	9300-49800		63	Non Catalytic
	Lennox Hearth Products	KS-1005, SV-14; KS-2000, FI-15	6	9500-41100		63	Non Catalytic
	Lennox Hearth Products	Grandview 300	3.1	10,249-29,181		63	Non Catalytic
	Lennox Hearth Products	Grand View 230, Montake 230	3.6	11,214 - 28,216		63	Non Catalytic
	Lennox Hearth Products	Earth Stove c-1002, and Ranger 1500HT, 1400HT	6.6	11700-37000		63	Non Catalytic
	Lennox Hearth Products	1000HT, 1100HT, 2000HT, 2200HT	8.3	6600-32200		63	Non Catalytic
	Lennox Hearth Products	ES2100	3.05	10,491 -30,387		63	Non Catalytic
(Lexington Forge	SSI 30	3.47	11,000-30,600		63	Non Catalytic
(Lexington Forge	SSW 30FTPB, SSW30FTAL, SSW30FTAPB	3.5	11,000-30,600		63	Non Catalytic
(Lexington Forge	SSW30STAL, SSW30STAPB Savannah	3.5	11,000-30,600		63	Non Catalytic
(Lexington Forge	Savannah SSW 20 and Windsor WCS20	3.76	11,000-45000		63	Non Catalytic
(Lexington Forge	SSW40	4.3	11,963-35767		63	Non Catalytic
(Long Agribusiness	Silent Flame Model 2058A	2.3	9600-30600		72	Catalytic
(Long Agribusiness	Silent Flame Model 2062	2.4	9900-32600		72	Catalytic
(Long Agribusiness	2062 Catalytic freestanding/insert	3.3	10600-20700		72	Catalytic
(Long Agribusiness	Silent Flame 2058	5.3	9000-27100		72	Catalytic
•	LOPI by Travis Industries, Inc	Declaration, Walden insert	4.1	11,300-33,400		63	Non Catalytic
	LOPI by Travis Industries, Inc.	Republic 1750, Endeavor and Revere Insert	1.94	9300-42200		63	Non Catalytic
	LOPI by Travis Industries, Inc.	Leyden	2.4	10,700-33,900		63	Non Catalytic
	LOPI by Travis Industries, Inc.	Liberty, Freedom Bay insert	2.4	12000-45100		63	Non Catalytic
	LOPI by Travis Industries, Inc.	Freedom	3.6	11800-47500		63	Non Catalytic
	LOPI by Travis Industries, Inc.	ANSWER, ANSER insert, Republic1250 and Avalon Spokane	4.4	11600-38500		63	Non Catalytic
(Luap Associates, Inc.	Eagle 2001	2.6	8400-55200		78	Pellet
	Lucky Distributing	Integra	3.6	10,024-31,268		78	Pellet
	Lucky Distributing	Esprit, Viva and Taurus	4.4	11,817-32,263		63	Non Catalytic
	M. Texeira International, Incorporated	Bef 520 H	6.4	11,721-25,859		63	Non Catalytic
(Martin Industries, Inc.	C-92	2.4	7200-29500		72	Catalytic
(Martin Industries, Inc.	Ashley APC2, APC2C; King KC2, KC2B; Atlanta AC2, AC2B	3	9700-27900		72	Catalytic
(Martin Industries, Inc.	C-92	3	13900-35700		72	Catalytic
(Martin Industries, Inc.	Ashley	3.8	5700-35300		72	Catalytic
(Martin Industries, Inc.	Ashley APS5, APS5B; King KC5, KC5B; Atlanta AC5, AC5B	3.8	9400-35400		72	Catalytic
(Martin Industries, Inc.	Ashley CAHF, CAHFB; King MCF, MCFB; Atlanta ACF, ACFB	4.8	9900-30000		72	Catalytic
(Martin Industries, Inc.	C-92	5.3	5200-33200		72	Catalytic
	Max Blank GmbH	Florenz K0 2, Volterra, Padua, Atlanta BF	3.1	11,842-34,680		63	Non Catalytic
	Max Blank GmbH	Atlanta K02, Siena, Monza, Davos, Ravenna, Heidelberg	4.5	11,479-36,009		63	Non Catalytic
	Max Blank GmbH	Solero, Toulouse, Zitro, Rio, Memphis, Niagara, Fisco	4.5	11,479-36,009		63	Non Catalytic
	Max Blank GmbH		5.14	10,500-33,000		63	Non Catalytic
	Max Blank GmbH	Mega K 03 Bordeaux	5.6	10,129-34,342		63	Non Catalytic
			5.6 1.3	, ,		63 78	Non Catalytic
	MCZ S.p.a.	Cubic, Cosmo Trendline, Soft Line, Fine Line, Zeus, Athene, Troja, Hera,	1.5	7,428 - 27,053		10	
	MCZ S.p.a.	Avanti	1.3	7,428 - 27,053		78	
	MCZ S.p.a.	Musa Air, Suite Air, Club Air, Sagar Air	1.3	7,428 - 27,053		78	Pellet
	MCZ S.p.a.	Star Air, Ego, Air, Toba Air, Sagar Air	1.4	8,233-24,533		78	Pellet
	MCZ S.p.a.	Nima Comfort Air, Club Comfort	1.8	9,704 - 31,758		78	
	MCZ S.p.a.	Musa Comfort Air, Suite Comfrot Air	1.8	9,704 - 31,758		78	Pellet
	Metal M.D.R. Inc.	Model HE-1400, XE-1400, & XTD-1.5	4.3	10,800-34,000		63	Non Catalytic

Actual Measured Efficiency - Per CSA B415.1 Default - Category rating assigned by EPA (The estimated efficiency is a follows: 72% (catalyst-equipped), 63% (non-catalyst equipped), and 78% (wood pellets)). § 60.536(i)(3).

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out of roductio			Emission	Heat Output	Actual Measured Efficiency (CSA	EPA Estimated (Default)	
	Manufacturer Name	Model Name	Rate G/Hr	btu/hr	B415.1)	Efficiency	Туре
	Metal M.D.R. Inc.	XVR-III, XLT-III	7.5	11,900-35,000		63	Non Catalyti
	Monessan Hearth Systems	Century/Dutchmaster FW and CDW	1	11,800-32,300		63	Non Catalyti
	Monessan Hearth Systems	Merrimack, Essex	3.6	10,554 - 31,780		63	Non Catalyt
	Monessan Hearth Systems	CJW2500X02, DW2500 and JW2500X10	4.7	9500-57800		63	Non Catalyt
	Monessan Hearth Systems	CW2500X00, CW2500X02, JW2500X00,	4.7	9500-57800		63	Non Catalyt
	Monessan Hearth Systems	Defiant 1975	2.3	9,600 - 26,600		63	Non Catalyt
	Monessan Hearth Systems	FW247001 to FE247004 and JW1000PF1	5	11500-18900		63	Non Cataly
	Monessan Hearth Systems	JW1000L10 and JW1000P10, DW1000, FW2400, S24	5.3	10600-26100		63	Non Catalyt
	Monessan Hearth Systems	Model Campbell II Elite S-24X & FW24 Series, CJW1000L02,	5.3	10600-26100		63	Non Catalyt
	Morso Jernstaberi A/S	2B Classic	3.9	10900 -23600		63	Non Cataly
	Morso Jernstoberi A/S	3112 and 3142	3.1	9,300-28,500		63	Non Cataly
	Morso Jernstoberi A/S	Model 4600	3.2	11,100-25,600		63	Non Cataly
	Morso Jernstoberi A/S	Squirrel 1410 ,1420,1440	3.3	9600-22000		63	Non Cataly
	Morso Jernstoberi A/S	Owl 3410/3440 & 3450	3.5	8400-23600		63	Non Cataly
	Morso Jernstoberi A/S	7600 Series	3.6	10,000 - 21,300		63	Non Cataly
	Morso Jernstoberi A/S	Model 4650 (Soapstone)	3.7	10,900-25,700		63	Non Cataly
	Morso Jernstoberi A/S	Model 2040	3.8	11,100-40,100		63	Non Cataly
	Morso Jernstoberi A/S	Model 7110	3.8	10,700-27,900		63	Non Cataly
	Morso Jernstoberi A/S	6100	4.1	11,117-22,000		63	Non Cataly
	Morso Jernstoberi A/S	Model 2B	4.1	9,300-30,700		63	Non Cataly
	Morso Jernstoberi A/S	Model 5660.	4.3	8,998- 50,078		63	Non Cataly
	Morso Jernstoberi A/S	Panther Model 2110B	4.3	8,600-42,100		63	Non Cataly
	Morso Jernstoberi A/S	Morso 1710	4.4	12,000-39,800		63	Non Cataly
	Morso Jernstoberi A/S	8140, 8142, 8147, 8151 and 8150	4.5	10,864-25,370		63	Non Cataly
	Morso Jernstoberi A/S	Panther 2110	4.7	10300-60500		63	Non Cataly
	Morso Jernstoberi A/S	Morso 7900 (7940, 7943, 7948, 7970, 7990)	4	11,600-26,705		63	Non Cataly
	Morso Jernstoberi A/S	8180	5.1	9,300-28,500		63	Non Cataly
	Morso Jernstoberi A/S	3600 Series	5.2	11,400-49,500		63	Non Cataly
		Breckwell W3000FS/W3000I	2.3	11600-33700		63	Non Cataly
	National Steelcrafters of Oregon	Craft Stove CB-4830				72	
	National Steelcrafters of Oregon		3.1 3.1	11600-41100		72	Catalytic
	National Steelcrafters of Oregon	Craft Stove CB-4830, CB-300		11600-41100		72 72	Catalytic
	National Steelcrafters of Oregon	Craft CB-4830 Insert	3.4	9100-22400			Catalytic
	National Steelcrafters of Oregon	Craft Stove CB-4426	3.9	12100-35600		72	Catalytic
	National Steelcrafters of Oregon	Craft Stove CB-4426, CB-26, CAT 44-1	3.9	12100-35600		72	Catalytic
	National Steelcrafters of Oregon	Chateau NC24	5.4	14500-51000		63	Non Cataly
	Navigator Stove Works, Inc.	NSW-1 Sardine	3.5	11,400-19,400		63	Non Catalyt
	Navigator Stove Works, Inc.	Navigator NSW2	3.6	10500-28200		63	Non Cataly
	New Buck Corporation (Buck Stove Corp.)	Buck Bay Model 91	1.2	8,800-51,200		72	Catalytic
	New Buck Corporation (Buck Stove Corp.)	New Buck/Carolina Model 17	1.2	8100-27900		72	Catalytic
	New Buck Corporation (Buck Stove Corp.)	94NC	3.81	11,390 - 42,200		63	Non Catalyt
	New Buck Corporation (Buck Stove Corp.)	Buck Master	2.1	10,800-49,800		72	Catalytic
	New Buck Corporation (Buck Stove Corp.)	50PCV, 50PBay, 50CV, 50CBay, 50CD, 50BCV, 50BBay	2.5	10100-38000		72	Catalytic
	New Buck Corporation (Buck Stove Corp.)	41BCV, BBay, CD, CS, CV, CBAY, PCV, PCBAY	2.6	6900-27800		72	Catalytic
	New Buck Corporation (Buck Stove Corp.)	MODEL XL-80	2.7	9200-40500		72	Catalytic
	New Buck Corporation (Buck Stove Corp.)	Model 261	2.92	10271-32263		63	Non Cataly
	New Buck Corporation (Buck Stove Corp.)	Model 18	3.1	10000-22400		63	Non Cataly
	New Buck Corporation (Buck Stove Corp.)	Model 20, catalytic	3.2	10800-37500		72	Catalytic
	New Buck Corporation (Buck Stove Corp.)	Bay Model 91	3.5	10400-50400		72	Catalytic
	New Buck Corporation (Buck Stove Corp.)	Buck/Tharrington 74/T-74	3.6	11,600-41,400		63	Non Cataly

Out of Productio			Emission	Heat Output	Actual Measured Efficiency (CSA	EPA Estimated (Default)	
n	Manufacturer Name	Model Name	Rate G/Hr	btu/hr	B415.1)	Efficiency	Туре
	New Buck Corporation (Buck Stove Corp.)	Model 71 Freestanding/Insert Catalytic	3.6	13100-40200		72	Catalytic
	New Buck Corporation (Buck Stove Corp.)	Regular Buck 27000-C	3.8	14700-25100		72	Catalytic
	New Buck Corporation (Buck Stove Corp.)	Little Buck 26000-C	4	6800-38700		72	Catalytic
	New Buck Corporation (Buck Stove Corp.)	Model 81/85	4.3	11900-45400		63	Non Catalyt
	New Buck Corporation (Buck Stove Corp.)	Model 21	4.4	12,000-444,000		63	Non Catalyt
	New Buck Corporation (Buck Stove Corp.)	Big Buck 28000-C	4.7	8500-39100		72	Catalytic
	New Buck Corporation (Buck Stove Corp.)	Regular Buck 27000-CR	4.8	14700-30800		72	Catalytic
	New Buck Corporation (Buck Stove Corp.)	Model 70	5	9800-31300		72	Catalytic
	New Buck Corporation (Buck Stove Corp.)	Model 26	5.4	11900-42600		63	Non Catalyt
	New Buck Corporation (Buck Stove Corp.)	Townsend III	6.2	11400-41200		63	Non Cataly
	New Buck Corporation (Buck Stove Corp.)	Buck Carolina/Tharington 51/T-51	6.7	11800-40900		63	Non Cataly
	Newmac Manufacturing Incorporated	Classic II Model NCM 120	3.04	10,700-27,000		63	Non Cataly
	Newmac Manufacturing Incorporated	Classic 1 EPA NC 100 E	4	10,632-26,986		63	Non Cataly
	Newmac Manufacturing Incorporated	WFA 70	2.72	11852 - 15922		63	Non Cataly
	Newmac Manufacturing Incorporated	Status EPA Model NS220 E	4.97	11,600-27,400		63	Non Cataly
[NHC Inc.	Model 3-C	2	7900-15000		72	Catalytic
	NHC Inc.	Harvest A-HII catalytic	2.5	10500-36400		72	Catalytic
	NHC Inc.	Mansfield I	2.9	13600-45300		63	Non Cataly
	NHC Inc.	Mansfield	3.2	10200-27900		63	Non Cataly
	NHC Inc.	Phoenix (Version 2)	3.4	10400-35200		63	Non Cataly
	NHC Inc.	Harvest HII	3.8	8800-28900		72	Catalytic
	NHC Inc.	Phoenix	4.94	10300-43000		63	Non Cataly
	Nordpeis A/S	Saturn A	6	10,100-25,000		63	Non Cataly
	NU-TEC/Upland Distributors, Inc.	Brenden BR-60	1.43	11000-29400		72	Catalytic
	NU-TEC/Upland Distributors, Inc.	Upland Amity AM-40	2.6	10600-23600		72	Catalytic
	NU-TEC/Upland Distributors, Inc.	Townsend Woodstove TN-25	2.7	10200-27500		72	Catalytic
	NYSERDA	XEOOS	2.4	11,519 - 27,432		63	Non Cataly
	OK Doke, Ltd.	Sweethearth Presidential 800/800XL	3.6	9900-20000		72	Catalytic
	Olsberg Hermann Everken, Gmbh	Bristol OH-L	2.1	11,800-32,200		63	Non Cataly
	Olsberg Hermann Everken, Gmbh	Bristol OH-M	2.7	11,000-33,200		63	Non Cataly
	Oregon Woodstoves, Inc.	Model OS/1	1.4	7800-40000		72	Catalytic
	Oregon Woodstoves, Inc.	#1, Design 01	2.7	9600-49700		72	Catalytic
	Orley's Manufacturing Company, Inc.	Cougar G-225	2.7	9100-36200		72	Catalytic
	Orley's Manufacturing Company, Inc.	Leopard U245,U246,UO245,UO246; Panther F245,F246	3.5	9100-39000		72	Catalytic
	Orrville Products, Inc.	COUNTRY COMFORT CC160	2.9	11900-47800		63	Non Cataly
	Orrville Products, Inc.	CC250	3.5	13200-29800		72	Catalytic
	Orrville Products, Inc.	Country Comfort CC325	3.5	18600-60600		72	
	Orrville Products, Inc.	CC 350	3.5 3.8	13700-68900		72	Catalytic Catalytic
	Orrville Products, Inc.	CC-350 CC-1851 and 1651	3.8 3.8	13700-68900		63	Non Catalytic
	Orrville Products, Inc.	CC-1851 and 1651 CC180	3.8 3.9	10700-57600		63	Non Cataly
[·	Country Comfort CC350	3.9 4.3	11200-29100		63 72	Catalytic
	Orrville Products, Inc.	,	4.3 4.4			63	,
	Orrville Products, Inc.	CC175 and CC155		10900-39200			Non Cataly
	Orrville Products, Inc.	Country Comfort CC160	5.25	11600-36500		63	Non Cataly
[Orrville Products, Inc.	CC185 and CC165	5.3	11300-46100		63	Non Cataly
	Orrville Products, Inc.	Country Comfort CC150, CC1000, CC150H	7.5	7200-23900		63	Non Cataly
	Orrville Products, Inc.	Country Comfort CC100	8.5	8700-33400		63	Non Cataly
	Orrville Products, Inc.	Country Comfort CC125	9.5	12300-27600		63	Non Cataly
	Osburn Manufacturing, Inc.	Imperial 2000	4.6	9000-33000		63	Non Cataly
	Osburn Manufacturing, Inc.	2200	5.7	10400-41500		63	Non Cataly
	Osburn Manufacturing, Inc.	1050	6.9	10600-42900		63	Non Cataly

Out of Productio			Emission	Heat Output	Actual Measured Efficiency (CSA	EPA Estimated (Default)	
n	Manufacturer Name	Model Name	Rate G/Hr	btu/hr	B415.1)	Efficiency	Туре
	Osburn Manufacturing, Inc.	Imperial MKII, MKII Insert, Goldenaire	7	10700-51600		63	Non Catalytic
	Pacific Energy Fireplace Products Limited	Neo 1.6	3.9	9161-34810	75	63	Non Catalytic
		Vista Series C, Vista Classic, Vista Artisan, Vista Insert, and					
	Pacific Energy Fireplace Products Limited	Alderlea T4	2.92	12400-26300		63	Non Catalytic
	Pacific Energy Fireplace Products Limited	Alderlea T5, Super 27 Design D, Spectrum, Step D1	3.4	11000-34600		63	Non Catalytic
		Standard, Pacific Ins, Spectrum Classic and Fusion, ALT5INS,					
	Pacific Energy Fireplace Products Limited	Super Insert	3.4	11000-34600		63	Non Catalytic
		Summit Series A, Summit Insert, Summit Classic and Alderlea					
	Pacific Energy Fireplace Products Limited	T6	3.6	10300-37500		63	Non Catalytic
	Pacific Energy Fireplace Products Limited	S-27, Spectrum, Standard, Pacific	6.4	10600-36400		63	Non Catalytic
	Pacific Energy Fireplace Products Limited	True North TN19	4.1	10,652 - 32923		63	Non Catalytic
	Pacific Energy Fireplace Products Limited	FP30	2.68	11829-38556		63	Non Catalytic
	Panda Wood Stoves	UMF-400	5	7600-38300		72	Catalytic
	Pellefier Inc.	Venturi PVI-87	0.5	9000-31800		78	Pellet
х	Polar Fireplaces	Woodchief 300 E	4.8	11600-43700		63	Non Catalytic
х	Polar Fireplaces	Woodchief 400 E	5.1	11500-59000		63	Non Catalytic
х	Precision Gas Technologies	WS-250	4	11700-50500		63	Non Catalytic
	PSG Distribution Inc.	Caddy (duct furnace)	6.6	12000-52900		63	Non Catalytic
	Quality Craft	QCPS - 28000	2.37	13,119 - 14,759		78	Pellet
	Rais A/S	Gabo Pina Vola	2.1	12,000-26,700		63	Non Catalytic
	Rais A/S	Malta, Bando and Bora	4.3	11400-32900		63	Non Catalytic
	RAIS A/S	Rondo, Mino II Steel and Mino II SST	4.3	11,431-22,561		63	Non Catalytic
	RAIS A/S	OPUS	5.7	11,479-21,630		63	Non Catalytic
	Rais A/S	Rais 60-A Insert	7.2	11600-51300		63	Non Catalytic
	Ravelli /EcoTeck	Laura / Veronica	3.87	8,500 - 44,000		78	Pellet
	Ravelli /EcoTeck	Sofia / Silvia	1.65	8,500 - 50,000		78	Pellet
	Ravelli /EcoTeck	Monica / Francesca	1.45	8,500 - 35,000		78	Pellet
	Ravelli /EcoTeck	Ilaria / Serena	4.4	8,500 - 44,000		78	Pellet
х	Renfyre Stove Co./ Maco Enterprises, Inc.	Fireview 2300	7	11700-27500		63	Non Catalytic
х	Renfyre Stove Co./Maco Enterprises Inc.	5000 Combination Range Design #50001	5.5	13600-21600		63	Non Catalytic
х	Renfyre Stove Co./Maco Enterprises, Inc	2800	3.4	11900-23700		63	Non Catalytic
х	Renfyre Stove Co./Maco Enterprises, Inc	Fireview Insert 2700	3.8	9400-27500		63	Non Catalytic
x	Reverso Manufacturing, Ltd.	Challenger MMX	2.6	11200-33800		63	Non Catalytic
x	Riteway-Dominion Manufacturing Company, I		4.5	7000-29100		72	Catalytic
x	RJM Manufacturing, Inc	Achiever FPI-1-LEX	2	7900-26700		72	Catalytic
х	RJM Manufacturing, Inc.	FPI-2-LEX/90	1.6	10300-36500		72	Catalytic
x	RJM Manufacturing, Inc.	Energy King Bay 2000C	2.5 3	11400-34600 16100-39800		72 72	Catalytic
x	RJM Manufacturing, Inc.	Energy King 2500C				72	Catalytic
х	RJM Manufacturing, Inc.	Model Silhouette 2850C	3.2	8100-34700			Catalytic
	RSF / Industrial Chimney Company, Incorpora		3.7 4	10600-49700 11100-25700		72 63	Catalytic Non Catalytic
		ate TOPAZ/CHAMELEON (Without Fan), TOPAZ, Chameleon	4 4.5			63	,
	RSF / Industrial Chimney Company, Incorpora			11800-35600		63	Non Catalytic
	RSF / Industrial Chimney Company, Incorpora RSF / Industrial Chimney Company, Incorpora		5.5 9.9	9500-25800 6400-30600		63	Non Catalytic Non Catalytic
	RSF / Industrial Chimney Company, Incorpora Russo Products. Inc.	W-25C	9.9 2.4	8400-30600 8400-31300		63 72	Catalytic
	Russo Products, Inc. Russo Products, Inc.	W-25C GV-30S	2.4	8400-31300 9500-38700		72 72	
	Russo Products, Inc. Russo Products, Inc.	GV-30S Russo Glassview GV-21	2.5 2.9	10200-29600		72	Catalytic
	,	GV-30C	2.9	10200-29600 10300-39400		72 72	Catalytic
	Russo Products, Inc. Russo Products, Inc.	W-18C	3.1 6.2	7900-40900		72	Catalytic Catalytic

Out of Productio			Emission	Heat Output	Actual Measured Efficiency (CSA	EPA Estimated (Default)	
n	Manufacturer Name	Model Name	Rate G/Hr	btu/hr	B415.1)	Efficiency	Туре
х	Salvo Machinery, Inc.	Citation Classic W45NC/WI45NC	7.1	11800-32200		63	Non Catalytic
х	Sarratt Agencies Limited	Merlin 3 FS-15, IS-15	6.1	9800-21100		63	Non Catalytic
K	Saxon Wood Heaters Pty, Ltd.	Rosewood	2.7	11600-36200		63	Non Catalytic
	Security Chimneys International Ltd.	BIS Ultima, Brentwood, BIS Tradition CE, and Montecito	3.692	10,442-27,746		63	Non Catalytic
	Security Chimneys International Ltd.	BIS Panorama, Villa Vista	4.1	10900-35,600		72	Catalytic
	Security Chimneys International Ltd.	BIS Nova, Ladera	4.8	8,700-25,700		63	Non Catalytic
	Security Chimneys International Ltd.	BIS Ultra	5.1	11033-46700		63	Non Catalytic
	Security Chimneys International Ltd.	BIS II	5.3	11300-41500		63	Non Catalytic
	Security Chimneys International Ltd.	BIS Design No. 1.2	5.5	14200-55800		63	Non Catalytic
	Security Chimneys International Ltd.	BIS Tradition and Montecito Estate	7.3	11,500-39-300		63	Non Catalytic
х	Selkirk Canada Corporation	Model: HE36	0.97	6,668-15,290		63	Non Catalytic
х	Selkirk Canada Corporation	Model HE40	5.7	11,383-45,459		63	Non Catalytic
	Seraph Industries	Genesis 106	2.1	11,100 - 45,100	83.2	78	Pellet
	Seraph Industries	Genesis 108	2.1	11,100 - 45,100	83.2	78	Pellet
	Sherwood Industries, Ltd.	CH-77, CH-84	3.1	8000-33800		72	Catalytic
		Envirofire EF2, EF2i, FS and FPI, Hudson River Davenport					
	Sherwood Industries, Ltd.	FS/FPI	1.25	6,500-34,000		78	Pellet
	Sherwood Industries, Ltd.	Boston 1700	4.5	8000- 65000		63	
	Sherwood Industries, Ltd.	Boston 1200	3.3	6500-74000		63	
	Sherwood Industries, Ltd.	Mini	1.6	22,585-30,113		78	Pellet
	Sherwood Industries, Ltd.	Empress FS	1.86	27.827-35.675		78	Pellet
	Sherwood Industries, Ltd.	EMPRESS FPI, Milan FPI	1.88	25,709-30,058		78	Pellet
	Sherwood Industries, Ltd.	Envirofire - EF3 FS, FPI, EF3Bi FS, Vista Flame VF100 FS	1.96	6,500-40,000		78	Pellet
	Sherwood Industries, Ltd.	Envirofire - Meridian FS & FPI	1.96	6,500-40,000		78	Pellet
	Sherwood Industries, Ltd.	Greenfire GF55, GFI55	1.96	6,500-40,000		78	Pellet
	Sherwood Industries, Ltd.	EF 3, Meridian and VF 100	2	6.500-40.000		78	Pellet
	Sherwood Industries, Ltd.	M55, M55C, V55	2	9,263-45,478		78	Pellet
	Sherwood Industries, Ltd.	Meridian	2.24	32,566-42,963		78	Pellet
	Sherwood Industries, Ltd.	Vista Flame 2100 FS, Envirofire 2100 FS	2.9	11800-34000		63	Non Catalytic
	Sherwood Industries, Ltd.	osburn	3.18	52,453-60,992		78	Pellet
	Sherwood Industries, Ltd.	Vista Flame Envirofire 2000	3.2	11000-31100		63	Non Catalytic
	Sherwood Industries, Ltd.	Enviro 1200, 1200I, Vista Flame 1200, 1200I, 1200 Venice	3.3	11,500-34,200		63	Non Catalytic
	Sherwood Industries, Ltd.	Vista Flame 1600 FS, 1600 FPI, Envirofire 1600 FS, 1600 FPI	3.5	11500-33600		63	Non Catalytic
	Sherwood Industries, Ltd.	Enviro Fire 1000FS and Vista Flame 1000FS, 1000 Enviro Model 1700I, 1700 & Vista Flame 1700I, 1700, 1700	4.1	11700-32700		63	Non Catalytic
	Sherwood Industries, Ltd.	Venice	4.5	9,400-31,800		63	Non Catalytic
	Sherwood Industries, Ltd.	Mini	1.6	8,378 - 23,488		63	Non Catalytic
	Sherwood Industries, Ltd.	Vista Flame Envirofire 1000	6.5	10200-30800		63	Non Catalytic
	Sherwood Industries, Ltd.	Vista Flame Envirofire 1500	0.5 7	11700-23100		63	Non Catalytic
.,	,						,
x	Sierra Products, Inc.	Sierra Evolution 8000 TEC	2.5	9700-35900		72	Catalytic
х	Sierra Products, Inc.	Evolution Model 7000C	2.8	7700-29400		72	Catalytic
х	Sierra Products, Inc.	Sierra Ambassador 4700 TEC	3.2	10800-42600		72	Catalytic
х	Sierra Products, Inc.	EF-2100	5.7	11,000-42,900		63	Non Catalytic
x	Sierra Products, Inc.	Sweet Home AFX-HT, AFI-HT	6.4	11300-28200		63	Non Catalytic
х	Sierra Products, Inc.	Cricket 5300	6.6	11000-36400		63	Non Catalytic
х	Sierra Products, Inc.	Sierra Classic 1500T	7.5	6900-34600		63	Non Catalytic
	Stove Builder International Inc.	BIO-45MF, Eco-45, FP-45, Hybrid-45MF	1.2	8,569-29,784		78	Pellet
х	Stove Builder International Inc.	Emerald 2000	1.7	7500-24500		78	Pellet

Out of Productio			Emission	Heat Output	Actual Measured Efficiency (CSA	EPA Estimated (Default)	
n	Manufacturer Name	Model Name	Rate G/Hr	btu/hr	B415.1)	Efficiency	Туре
	Stove Builder International Inc.	BIO-35MF, Eco-35, FP-35, Hybrid-35MF	1.77	6,668-15,290		78	Pellet
	Stove Builder International Inc.	Osburn 1100, Osburn 1100-I	2.9	11,000- 35,000		63	Non Catalytic
	Stove Builder International Inc.	Caddy, Alterna	4.2	10,142 - 71.014		78	Pellet
	Stove Builder International Inc.	FW3000 HT 1600-Standard/HT 1600 Deluxe, HT-1600 Siberian, Ashley	3.5	11,800-32,400		63	Non Catalytic
	Stove Builder International Inc.	1600	3.5	11200-26400		63	Non Catalytic
	Stove Builder International Inc.	Osburn 2400 B	3.5	11900-40900		63	Non Catalytic
	Stove Builder International Inc.	Osburn 2400-I, Osburn 2400 FS	3.5	11,900-40,900		63	Non Catalytic
	Stove Builder International Inc.	Euromax, Eco-65	2.58	6,873-34,727		78	Pellet
	Stove Builder International Inc.	HT-2000 Standard/HT-2000 Deluxe/HT-2000	3.9	11600-60300		63	Non Catalytic
	Stove Builder International Inc.	HT2000, Solution 3.4, Ashley 2000	3.9	11,600-38,700		63	Non Catalytic
	Stove Builder International Inc.	1600	4.4	11800-42400		63	Non Catalytic
(Stove Builder International Inc.	Monaco 2008	4.4	11479-30,450		63	Non Catalytic
	Stove Builder International Inc.	Monaco, Stratford, Solution 2.5, Lafayette	4.4	11,479-30,450		63	Non Catalytic
	Stove Builder International Inc.	Osburn 1600, Osburn 1600-I, Ashley 4600, Forrester 4700	4.4	11,800-42,400		63	Non Catalytic
ĸ	Stove Builder International Inc.	1600 B-I/Ashley 4600/Forester 4700	4.8	11900-35500		63	Non Catalytic
	Stove Builder International Inc.	S244, Pyropak, Osburn 900 Gemini 1500 (With Blower), Adirondack, Savannah, Eldorado,	5.3	10,600-26,100		63	Non Catalytic
	Stove Builder International Inc.	Jurassien, Celtic, Osburn 1500 HE-1800,Escape 1800, Solution 2.3, Solution 2.3-I, XTD1.9,	6.2	11500-43900		63	Non Catalytic
	Stove Builder International Inc.	XTD1.9-I, Osburn 2000, Osburn 2000-I, Dundee 1.9	6.3	11,600-38,700		63	Non Catalytic
	Stove Builder International Inc.	HT-1200 and Ashley 1200	6.5	8300-36000		63	Non Catalytic
	Stove Builder International Inc.	HT1200, Ashley 1200 Gemini 1500 (Without Blower), Adirondack, Savannah,	6.5	8,300-36,000		63	Non Catalytic
	Stove Builder International Inc.	Eldorado, Jurassien, Celtic, Osburn 1500 XTD1.5, XTD1.5-I, Solution 1.8, Solution 1.8-I, Escape 1400-I,	7.5	11100-37300		63	Non Catalytic
	Stove Builder International Inc.	Blackcomb, Columbia	4.3	10,800-34,000		63	Non Catalytic
	Stove Builder International Inc.	1.6 Series	4.02	0,852 - 23,272/3	3	63	Non Catalytic
	Stove Builder International Inc.	1.3 Series	3.99	9,887 - 21.825		63	Non Catalytic
	Stove Builder International, Inc.	Osburn 1800, Osburn 1800-I	2.7	9700-36300		63	Non Catalytic
	Stove Builder International, Inc.	Osburn 2200, Osburn 2200-I	2.7	11700-30400		63	Non Catalytic
	Stove Builder International, Inc.	Apollo, Apollo II	3.6	10600-24700		63	Non Catalytic
	Stove Builder International, Inc.	Le Chancelier, NXT-1 and Solution 2.9, Glencoe 2.1	4.4	11900-29400		63	Non Catalytic
(Stove Builder International, Inc.	LeBachelier	4.9	11800-24500		63	Non Catalytic
	Stove Builder International, Inc.	New Generation NG 1800/Magnolia 2015	5.7	11,500-30,800		63	Non Catalytic
	Stove Builder International, Inc.	Osburn 1100	5.7	11000-35000		63	Non Catalytic
	Stove Builder International, Inc.	XVR-II, XT-1400 adn XLT-II, Eastwood 1500, Jasper, Clyde 1.6	5.9	11800-27300		63	Non Catalytic
	Stove Builder International, Inc.	XVR-I, XLT-1, Classic, Eastwood 1800	6.9	11,400-27,500		63	Non Catalytic
	Stove Builder International, Inc.	XVR-III, XLT-III, Eastwood, 1900, Millenia	7.4	11,900-34,700		63	Non Catalytic
	Stove Builder International, Inc.	Sahara, Kyle 2.0	7.5	11,000-25,700		63	Non Catalytic
	StoveBuilder International, Inc.	FP-8, Saguenay	4	10,900 -36,900		63	Non Catalytic
	StoveBuilder International, Inc.	FP-9i	4.2	11,600-38,700		63	Non Catalytic
	StoveBuilder International, Inc.	FW2700, Deco, Optima	4.4	11,000-69,500		63	Non Catalytic
	StoveBuilder International, Inc.	CW2500, Solution 2.0-I	4.7	9,600-57,800		63	Non Catalytic
	StoveBuilder International, Inc.	FW2470 Legend, Baltic, Austral, Myriad, Azimuth, Osburn 2300, Magnolia		12,000- 28,500		63	Non Catalytic
	StoveBuilder International, Inc.	2015	5.7	11,500-30,800		63	Non Catalytic
	StoveBuilder International, Inc.	Model HE-1800, XE-1800 & XTD-1.9	5.9	11600-38700		63	Non Catalytic
	StoveBuilder International, Inc.	Mini-Caddy	6	10,900-36,900		63	Non Catalytic

Out of Productio			Emission	Heat Output	Actual Measured Efficiency (CSA	EPA Estimated (Default)	
n	Manufacturer Name	Model Name	Rate G/Hr	btu/hr	B415.1)	Efficiency	Туре
	StoveBuilder International, Inc.	Eurostar, Osburn 5000	2.18	10.301 - 30,456		78	Pellet
	StoveBuilder International, Inc.	XTD1.1, XE-1000, Solution 1.6	6	9900-47300		63	Non Catalytic
	StoveBuilder International, Inc.	2.3 Series	3.89	11,600 - 32,200		63	Non Catalytic
	StoveBuilder International, Inc.	Caddy, Caddy-on, Tundra, Heatmax	6.6	12,000-52,100		63	Non Catalytic
	Stove Builder International Inc.	Olympia	4.6	9,659-26,407		72	Catalytic
	Stove Builder International Inc.	Evolution	3.5	8588 - 37,513		63	Non Catalytic
	Stove Builder International Inc.	Malibu 1700/2200	4.97	11,700-29.700		63	Non Catalytic
	Stove Builder International Inc.	Rustic 2100 and Tradition 2100	4.97	11,700-29,700		63	Non Catalytic
	Stove Builder International Inc.	Diamant, Diamante Insert	7.5	11,100-26,100		63	Non Catalytic
	Stove Builder International Inc.	Rustic/Tradition 1600	3.5	8588 - 37,513		63	Non Catalytic
	Stove Builder International Inc.	EverestEtna/Equinox/Malibu 2000	5.6	12,588 - 37,513		63	Non Catalytic
	Stove Builder International Inc.	EverestEtna/Equinox/Malibu 2500	5.9	12,588 - 37,513		63	Non Catalytic
	Stuv S.A.	30 Compact	2.79	12,129 - 16,640		63	Non Catalytic
x	Suburban Manufacturing Company	Woodchief W6-88C, Woodmaster W6-88WC	3.4	9500-42500		72	Catalytic
	TEC Enterprises	2000 pellet stove	4.7	11600-22500		78	Pellet
	Thelin Company Inc.	Little Gnome Pellet Stove	3.28	3100-8400		78	Pellet
	Thelin Company Inc.	Thelin T-4000	3.6	9,900-38400		63	Non Catalytic
	Thelin Company Inc.	Providence, Providence Signature	1.2	12,839 - 35,680		78	Pellet
x	Thermic Distribution Europe	Efel Symphony 390.74	1.8	10700-33000		72	Catalytic
x	Thermic Distribution Europe	Harmony IIIB	2.7	11,200-57,300		63	Non Catalytic
x	Thermic Distribution Europe	Model S-33,H33,R33,33	3.3	8,600-37,300		63	Non Catalytic
x	Thermic Distribution Europe	Efel Harmony 386.75	3.8	7100-51000		72	Catalytic
x	Thermic Distribution Europe	Harmony I	4.4	11800-55000		63	Non Catalytic
	Thermic Distribution Europe	S43, H43, SP43, C43	4.17	12,500-39,275		63	Non Catalytic
x	Thermic Distribution Europe	Efel Symphony 387.74	5.1	10600-49700		72	Catalytic
x	Thermic, Inc.	Crossfire FS-1	0.5	6900-39900		78	Pellet
x	Tianjin Berkeley Furniture Corporation	TR 001	4.18	9200-28300		63	Non Catalytic
	Travis Industries. Inc.	Small Flush Wood Hybrid Fyre	0.89	9,784-31,428	76.51	72	Catalytic
x	Travis Industries, Inc	Avalon Cottage/Mission	2.9	11600-36500	10.01	63	Non Catalytic
x	Travis Industries, Inc	Lopi Sheffield	3.9	10,300-34,400		63	Non Catalytic
x	Travis Industries, Inc	Flush Wood A Fireplace Insert	4.1	11,300-33,400		63	Non Catalytic
x	Travis Industries, Inc	Lopi Flawless Performance 380, 440	7	6900-48700		63	Non Catalytic
^	Travis Industries, Inc.	Avalon Spokane 1750 380-NT & X-NT	1.94	9300-42200		63	Non Catalytic
x	Travis Industries, Inc.	Flush Wood	2.45	12,084 - 29,605		63	Non Catalytic
^	Travis Industries, Inc.	Lopi Endeavor, Lopi Revere , Lopi Republic 1750,	1.94	9300-42200		63	Non Catalytic
	Travis Industries, Inc.	Avalon Rainier 90/Rainier 45	1.94	11200-40000		63	,
		Fireplace Xtrordinair Elite 36 Z.C. & B.I.	2.3	11200-40000		63 72	Non Catalytic Catalytic
x	Travis Industries, Inc. Travis Industries, Inc.	Model 44-A BI and Z.C.	2.3	10700-75700		72	
X	,		2.3			63	Catalytic
	Travis Industries, Inc.	Leyden and Avalon Arbor		10,700-33,900		63 72	Non Catalytic
	Travis Industries, Inc.	Fireplace Xtrordinair 44 Elite	2.5	11000-45300			Catalytic
.,	Travis Industries, Inc.	Avalon Olympic,Liberty, Freedom Bay	2.6	12000-45100		63 72	Non Catalytic
x	Travis Industries, Inc.	Lopi Flex FS, FL, LX	2.9	10900-31000			Catalytic
	Travis Industries, Inc.	Avalon Pendelton 90/Pendelton 45	3	8700-44400		63	Non Catalytic
x	Travis Industries, Inc.	LOPI Answer/Patriot (Formerly Answer-NT)	3.3	12000-41000		63	Non Catalytic
x	Travis Industries, Inc.	Avalon 1000C2	3.5	7300-47100		72	Catalytic
x	Travis Industries, Inc.	Model 36 F	4	11900-55000		72	Catalytic
х	Travis Industries, Inc.	Fireplace Xtrordinair Model 36A	4.1	10300-54700		72	Catalytic
х	Travis Industries, Inc.	Flex-95 FL, LX, and FS	4.1	10900-55300		72	Catalytic
х	Travis Industries, Inc.	Lopi Elan E1, E2	4.3	11700-26300		63	Non Catalytic

Out of Productic			Emission	Heat Output	Actual Measured Efficiency (CSA	EPA Estimated (Default)	
n	Manufacturer Name	Model Name	Rate G/Hr	btu/hr	B415.1)	Efficiency	Туре
		ANSWER/LOPI PATRIOT/LOPI PARLOR, Republic1250 and					
	Travis Industries, Inc.	Avalon Spokane, Avalon Camano	4.4	11600-38500		63	Non Catalytic
	Travis Industries, Inc.	Avalon 901	5.2	7500-45500		63	Non Catalytic
(Travis Industries, Inc.	LOPI 380-96	5.2	9400-52800		63	Non Catalytic
(Travis Industries, Inc.	Avalon 996	5.5	9500-45600		63	Non Catalytic
(Travis Industries, Inc.	Avalon 700	5.9	9200-39100		63	Non Catalytic
	Travis Industries, Inc.	Lopi X Fireplace Insert	6	13600-29100		63	Non Catalytic
(Travis Industries, Inc.	Lopi The Answer	6.7	10500-63100		63	Non Catalytic
x	Travis Industries, Inc.	Lopi Premiere Answer Series PA1, PA2, PA3, PA4, PA5	7	8000-31500		63	Non Catalytic
(Travis Industries, Inc.	Lopi X/96	7.2	11600-53900		63	Non Catalytic
(Travis Industries, Inc.	Avalon 1196, Lopi 520/96, Flush Bay-96	7.4	11300-43600		63	Non Catalytic
(Travis Industries, Inc.	Lopi Elan-96	7.4	12000-51400		63	Non Catalytic
	Travis Industries, Inc.	LG Flushwood Insert Hybrid - Fyre	0.58	8544-35278	80.3	72	Catalytic
	Travis Industries, Inc.	Cape Cod	0.45	10,749 - 39,413	80.1	72	Catalytic
	Travis Industries, Inc.	Flushwood Plus	4.4	12000 - 29600		72	Non Catalytic
(Tri-Fab, Inc.	SunRise P-54 & SunRise PIL-8	5	10600-26500		63	Non Catalytic
x	Tri-Fab, Inc.	SunRise P-48-H, P-48-L	5.5	11700-25800		63	Non Catalytic
x	Tri-Fab, Inc.	SunRise P56	6.2	10700-39700		63	Non Catalytic
	Tulikivi Oyj	Tulikivi Maxi XV 2	4.22	12,058-38,224		63	Non Catalytic
	Tulikivi Oyj	Tulikivi MINI XV 1	4.51	12,100-38,200		63	Non Catalytic
	United States Stove Company	Ashley CAHF-2, Atlanta ACF-2, King MCF-2	1.6	12,800 - 38.900		72	Catalytic
	United States Stove Company	Ashley AHS2, AHS2B; King KHS2	1.9	13700-34300		72	Catalytic
	United States Stove Company	2500 ST	3.1	11,576 - 36,295		63	Non Catalytic
	United States Stove Company	Country Hearth 2200l	5.4	27,136 - 69,000		63	Non Catalytic
	United States Stove Company	Ashley AFS24, King K3, cat., freestanding/insert	2.6	10300-34600		72	Catalytic
	United States Stove Company	Forester Model 5824	4.6	7,775 - 15,974		63	Non Catalytic
	United States Stove Company	Clayton Mfg Clay 60B, 70	2.7	12100-54300		72	Catalytic
	United States Stove Company	Ashley C-92	3	11000-36900		72	Catalytic
	United States Stove Company	Wonder Wood (Glass Front) 2921, Sears 143.8417	3.3	12500-54600		72	Catalytic
	United States Stove Company	Bay Insert 4500	3.7	9600-30700		72	Catalytic
	United States Stove Company	Wonder Wood 6000, 2821, Sears 143.8404	3.7	9100-18700		72	Catalytic
	United States Stove Company	ASHLEY NCA-1/KING KPS	7.16	6500-23200		63	Non Catalytic
	United States Stove Company	6039, 6039 T, 6039 HF, 6039 TP, 6041	1.5	8,528-29,921		78	Pellet
	United States Stove Company	5500M, 5500XL, 5500XLT	1.6	9,126-27,677		78	Pellet
	United States Stove Company	Model 2500, SW3100	3.06	10,100-25,000		63	Non Catalytic
	United States Stove Company	APS 1100B	5.9	10,100-25,000		63	Non Catalytic
	United States Stove Company	2000, SW2100	3.69	11,817 - 31,713		63	Non Catalytic
	United States Stove Company	2400	1.13	7,315 - 14,033		72	Non Catalytic
	United States Stove Company	3000 (AFS7500), SW4100	1.9	11,624 - 38,140		63	Non Catalytic
	United States Stove Company	3000 FT	1.9	11,624 - 38,140		63	Non Catalytic
	United States Stove Company	Breckwell W3000FS/W3000I	2.3	11,600 - 33,700		63	Non Catalytic
	United States Stove Company	Vogelzang, Ashley, King (5770, VG5770)	3.17	10,898-24,335		78	Pellet
	United States Stove Company	Breckwell (SW740)	2.47	11,057-36,681		63	Non Catalytic
	Vermont Castings	Encore 2040	1.6	9,975 - 33,963		63	Non Catalytic
	Vermont Castings	Defiant Encore	0.6	6200-32900		72	Catalytic
	Vermont Castings	Encore 1450 N/C	0.7	10,600-24050		63	Non Catalytic
	Vermont Castings	Defiant 1910 & 1945	0.8	10600-44400		72	Catalytic
	Vermont Castings	2370	1	5700-18300		72	Catalytic
	Vermont Castings	Century/Dutchmaster FW and CDW	1	11,800-32,300		63	Non Catalytic
	Vermont Castings	Dutchwest Small Convection Heater #2460	1.1	6600-27300		72	Catalytic

f Ictio			Emission	Heat Output	Actual Measured Efficiency (CSA	EPA Estimated (Default)	
	Manufacturer Name	Model Name	Rate G/Hr	btu/hr	B415.1)	Efficiency	Туре
	Vermont Castings	Dutchwest Extra Large Convection 2462	1.3	8300-28000		72	Catalytic
	Vermont Castings	FA455	1.3	10400-26500		72	Catalytic
	Vermont Castings	DutchWest Large 2479	1.31	11,300-26,500		63	Non Catalytic
	Vermont Castings	Dutchwest Large Convection Heater (Model 2461)	1.41	10700-29500		72	Catalytic
	Vermont Castings	DutchWest Small Model 2460	1.41	7,800-25,100		63	Non Catalytic
	Vermont Castings	DutchWest Medium 2478	1.5	10,600-25,300		63	Non Catalytic
	Vermont Castings	C.D. Lg. Fed. Convection Heater FA264CCL, FA264CCR	1.6	6600-26700		72	Catalytic
	Vermont Castings	Defiant Encore 2550 (Formerly 2190)	1.6	8700-41700		72	Catalytic
	Vermont Castings	Defiant Encore 2140	1.8	9000-41300		72	Catalytic
	Vermont Castings	Intrepid II Model 1990	2.1	8300-26700		72	Catalytic
	Vermont Castings	Model 2170	2.1	9400-22800		72	Catalytic
١	Vermont Castings	WinterWarm Fireplace Insert Model 1280	2.1	10300-30000		72	Catalytic
`	Vermont Castings	WinterWarm Small Insert Model 2080	2.1	8700-31100		72	Catalytic
`	Vermont Castings	FA264	2.2	9500-31700		72	Catalytic
١	Vermont Castings	Intrepid II Model 2070	2.4	9200-19300		72	Catalytic
``	Vermont Castings	Model EWF 36A	2.4	11,300-75,500		72	Catalytic
١	Vermont Castings	C.D. Extra-Lg. Federal Convection Heater FA288CCL	2.6	8400-38700		72	Catalytic
	Vermont Castings	EWF36	2.7	11,800-68,600		72	Catalytic
	Vermont Castings	C.D. Small Federal Convection Heater FA224CCL	2.8	7000-30600		72	Catalytic
	Vermont Castings	C.D. Rocky Mountain Heater FA211CL	2.9	6800-27800		72	Catalytic
	Vermont Castings	Montpelier	2.9	10,094-27,550		63	Non Catalytic
	Vermont Castings	Montelier/Stratton	2.9	10094-2727550		63	Non Catalytic
	Vermont Castings	Vermont Castings Defiant 1610	2.9	10,000-30,000		63	Non Catalytic
	Vermont Castings	2370	3	10.094-27,550		72	Catalytic
	Vermont Castings	FA224	3.1	9100-34800		72	Catalytic
	Vermont Castings	FA288	3.1	7800-29300		72	Catalytic
	Vermont Castings	Intrepid II 1308	3.1	10200-22500		72	,
		•					Catalytic
	Vermont Castings	Intrepid Model 1640	3.3	8200-19500		63	Non Catalytic
	Vermont Castings	Madison Model 1655	3.3	11,300-39,700		63	Non Catalytic
	Vermont Castings	Resolute Acclaim (Model Number 2490) & TLWS1	3.4	9500-33900		63	Non Catalytic
	Vermont Castings	C.D. Federal "A Plus" FA224ACL	3.5	7200-30000		72	Catalytic
	Vermont Castings	EWF 30	3.5	11,100-40,500		63	Non Catalytic
	Vermont Castings	C.D. Sequoia FA455	3.6	8700-60300		72	Catalytic
	Vermont Castings	C.D. Adirondack Wood Heater FA267CL	3.7	8400-40000		72	Catalytic
	Vermont Castings	WinterWarm Small Insert (model 2370)	4	9250-21500		72	Catalytic
	Vermont Castings	Aspen 1920 & Plymouth HWS10	4.3	9100-18000		63	Non Catalytic
`	Vermont Castings	C.D. Large Federal Box Heater FA209CL	4.3	9000-25600		72	Catalytic
١	Vermont Castings	C.D. Small Federal Box Heater FA207CL Campbell/Jacuzzi FW300005-FW300008 & FW300019-	4.3	6200-28000		72	Catalytic
١	Vermont Castings	FW300027	4.4	12000-55100		63	Non Catalytic
١	Vermont Castings	CJW2000L02, JW2000L10, DW2000XXX and JW2000P10	4.4	12000-55100		63	Non Catalytic
١	Vermont Castings	JW1500L10 and JW1500P10, FW1500, DW1500	4.4	10300-29200		63	Non Catalytic
`	Vermont Castings	S27X/S28X & FW27 Series, CJW1500L02, S27X/S28X & FW27 Series, CJW1500L02, JW1500L10 and	4.4	10300-29200		63	Non Catalytic
`	Vermont Castings	JW1500P10, FW1500, DW1500	4.4	10300-29200		63	Non Catalytic
	Vermont Castings	Seville 1635 and 1600 Insert	4.5	9,900-30,800		63	Non Catalytic
		CW2500X00, CW2500X02, JW2500X00, CJW2500X02,		1,111 00,000			eatalytio
١	Vermont Castings	DW2500 and JW2500X10	4.7	9500-57800		63	Non Catalytic
	Vermont Castings	FW247001 to FE247004 and JW1000PF1	5	11500-18900		63	Non Catalytic
	Vermont Castings	Resolute Acclaim 0041	5.1	8700-30900		72	Catalytic

Dut of Productio			Emission	Heat Output	Actual Measured Efficiency (CSA	EPA Estimated (Default)	
۱ I	Manufacturer Name	Model Name	Rate G/Hr	btu/hr	B415.1)	Efficiency	Туре
	Vermont Castings	Madison 1650	5.5	11400-31000		63	Non Catalytic
	Vermont Castings	Seville Insert	5.5	10200-27400		63	Non Catalytic
	Vermont Castings	Aspen Model 1920	6.3	10100-26400		63	Non Catalytic
	Vermont Castings	Dutchwest 2477	1.4	7800-25100		63	Non Catalytic
	Vermont Castings	Defiant 1975	1.1	11400-34065		72	Catalytic
	Vermont Castings	Savannah SSW30FTAL	2.5	11600-30601		63	Non Catalytic
	Vermont Castings	Savannah SSW30FTAPB	2.5	11600-30602		63	Non Catalytic
	Vermont Castings	Savannah SSW30STAPB	2.5	11600-30604		63	Non Catalytic
	Vermont Castings	Savannah SSW30STAL	2.5	11600-30-603		63	Non Catalytic
	Vermont Castings	Savannah SSW30FTPB	2.5	11600-30600		63	Catalytic
	Vermont Castings	Savannah SSI30	3.47	11000-30600		63	Non Catalytic
	Vermont Castings	Savannah SSW40	4.3	11953-35767		63	Non Catalytic
	Vermont Castings	Dutchwest DW270007	4.4	10300-29201		63	Non Catalytic
	Vermont Castings	Dutchwest DW2500X02	4.7	9500-57801		63	Non Catalytic
	Vermont Castings	Dutchwest DW2000L02	2.7	11800-32301		63	Non Catalytic
	Vermont Castings	Dutchwest DW1500L02	4.4	10300-29201		63	Non Catalytic
	Vermont Castings	Dutchwest DW244	5.3	10600-26101		63	Non Catalytic
	Vermont Castings	Dutchwest DW 247001	5	11500-18901		63	Non Catalytic
	Vermont Castings	Dutchwest DW1000L02	5.3	10600-26101		63	Non Catalytic
	Vermont Castings	Dutchwest DW300007	2.7	11800-32300		63	Non Catalytic
	Vermont Castings	Merrimack	3.6	10574-31780		63	Non Catalytic
	Vermont Castings	Savannah SSW20	3.8	11000-45000		63	Non Catalytic
	Vermont Castings	Windsor WR244	5.3	10600-26100		63	Non Catalytic
	Vermont Castings	Seville 1630, Stratton	6.3	12000-27300		63	Non Catalytic
	Vestal Manufacturing	Vestal Fireplace Insert V-200-I, V-200-P, V-200-L	2	11700-26500		72	Catalytic
	Vestal Manufacturing	Vestal Radiant Heater V-100	2.2	9400-27700		72	Catalytic
	Vogelzang International Corporation	TR-009B Performer	3.73	11,299-36,089		63	Non Catalytic
	Vogelzang International Corporation	TR-009 Performer	3.89	11,299-36,089		63	Non Catalytic
	Vogelzang International Corporation	TR-004 Colonial	4.02	11,299-36,089		63	Non Catalytic
	Vogelzang International Corporation	Durango TR001 and Model TR002	3.6	11,299-36,089		63	Non Catalytic
	Vogelzang International Corporation	Highlander, Shiloh Insert, Model TR003	3.8	9000-26300		63	Non Catalytic
	Vogelzang International Corporation	TR007 Norwood, TR011 Norwood	3.2	11,913-34,108		63	Non Catalytic
	Vogelzang International Incorporated	Defender	4.18	9200-28300		63	Non Catalytic
	Wamsler Herd und Ofen GmbH	HOK 10	4.6	9200-16900		63	Non Catalytic
	Waterford Stanley Limited	104 MK II 31	2.9	8800-25900		63	Non Catalytic
	Waterford Stanley Limited	100B 90 32 TV	3.1	10800-32400		63	Non Catalytic
	Waterford Stanley Limited	100B 90 32 RV	3.9	10600-26500		63	Non Catalytic
	Waterford Stanley Limited	Trinity OA	3.97	11500-43800		63	Non Catalytic
	Waterford Stanley Limited	Ashling	4.1	12000-29800		63	Non Catalytic
	Waterford Stanley Limited	Erin OA	4.1	10400-30300		63	Non Catalytic
	Waterford Stanley Limited	Erin/90 TV	4.1	10500-40900		63	Non Catalytic
				9000-26700		63	
	Waterford Stanley Limited	Model 100B, 100B O.S.A., Leprechaun	4.3			63	Non Catalytic
	Waterford Stanley Limited	Erin/90 TV Tribity 25	5.7 7	10200-39900		63 63	Non Catalytic
	Waterford Stanley Limited	Trinity 35		11800-39300			Non Catalytic
	Waterford Stanley Limited	100B Design 29, Fionn	7.5	7200-27500		63	Non Catalytic
	Waterford Stanley Limited	Erin	7.6	11800-41500		63	Non Catalytic
	Webco Industries	Marquis 800, 800 XL	3.6	9900-20000		72	Catalytic
	Weitz & Co., Inc.	Briarwood XE 88	6.4	12800-34200		63	Non Catalytic
	Weitz & Co., Inc.	Briarwood BB, BBI and BBZC	4.8	10600-25300		63	Non Catalytic
	Weitz & Co., Inc.	Eagle 88, Pioneer ZC	6.4	12800-22800		63	Non Catalytic

Out of Productic			Emission	Heat Output	Actual Measured Efficiency (CSA	(Default)	
n	Manufacturer Name	Model Name	Rate G/Hr	btu/hr	B415.1)	Efficiency	Туре
х	Weitz & Co., Inc.	Briarwood II 87	7.3	9900-45900		63	Non Catalytic
х	Welenco Manufacturing, Inc.	P-1000W	0.7	9600-23900		78	Pellet
	Weso-Aurorahautte GmbH	Prestige 125, 225, 325, 425	7.3	8900-31200		63	Non Catalytic
	Weso-Aurorahautte GmbH	Renaissance 326	8	9200-32900		63	Non Catalytic
	Winrich International	Winrich Pellet Stove	1.6	8500-27900		78	Pellet
х	Winston Stove Company	Model WP-18	0.6	10000-21300		78	Pellet
х	Winston Stove Company	Model WP-24	1.5	9700-29400		78	Pellet
	Wiseway Pellet Stoves	GW1949	1.9	7481-19475		78	Pellet
	Wittus Fire By Design	XEOOS Twinfire	2.4	11,519- 27,432		63	Non Catalytic
	Wittus Fire By Design	Shaker Stove	7.3	9,667-29,242		63	Non Catalytic
	Wolf Steel Ltd.	NPS45	2.4	8,827 - 29,023		78	Pellet
	Wolf Steel Ltd.	1900 series (Napoleon 1900)	2.9	11800-34000		63	Non Catalytic
	Wolf Steel Ltd.	Napoleon 2000	3.2	11000-31100		63	Non Catalytic
	Wolf Steel Ltd.	1400 series (Napoleon 1400, 1400L, 1450,1401)	3.5	11500-33600		63	Non Catalytic
	Wolf Steel Ltd.	2200 series (Timberwolf 2200, 2201)	3.6	12,084-31436		63	Non Catalytic
	Wolf Steel Ltd.	2100 series (Timberwolf)	3.9	11,238-37580		63	Non Catalytic
	Wolf Steel Ltd.	1100 series (Napoleon 1100, 1100L, 1100C, 1150, 1101)	4.1	11700-32700		63	Non Catalytic
	Wolf Steel Ltd.	NZ25	4.46	11200-32300		63	Non Catalytic
	Wolf Steel Ltd.	EPA1600C	5.4	12,375-28,127		63	Non Catalytic
	Wolf Steel Ltd.	NZ-26	5.4	11500-27400		63	Non Catalytic
	Wolf Steel Ltd.	Napoleon 1000	6.5	10200-30800		63	Non Catalytic
	Wolf Steel Ltd.	Napoleon 1500	7	11700-23100		63	Non Catalytic
	Wolf Steel Ltd.	1600C-1	7.18	9,200-33,400		63	Non Catalytic
	Wolf Steel Ltd.	TPSI35	2.1	11,200 - 36,000		78	Pellet
	Wolf Steel Ltd.	NZ3000	7.2	11129-31436		63	Non Catalytic
	Wolf Steel Ltd.	EPI22	2.6	11129-31436		63	Non Catalytic
	Wolf Steel Ltd.	EPI3	2.6	11,281 - 28,500		63	Non Catalytic
х	Wolf's Casual Living	BV	3.8	10800-35400		72	Catalytic
х	Wolf's Stoves	BV2 Elite Bay	2.6	11700-46100		63	Non Catalytic
х	Woodkiln Inc.	Woodkiln WK-23	3.8	10700-27200		63	Non Catalytic
	Woodstock Soapstone Company, Inc.	Catalytic Fireview Soapstone Stove #205	1.35	10900-42900		72	Catalytic
	Woodstock Soapstone Company, Inc.	Paladian Model 202, Paladian Model 203 & Keystone Model 204	1.9	8500-35000		72	Catalytic
	Woodstock Soapstone Company, Inc.	Catalytic Fireview Soapstone Stove #201, Classic #200	3.5	13200-40000		72	Catalytic
	Woodstock Soapstone Company, Inc.	Progress Hybrid Soapstone Stove #209	1.33	12,538 - 73,171	81	78	Catalytic-Hybrid
х	Yunca Heating	Yunca WEGJ E/481	5	10700-30300	-	63	Non Catalytic
	Zephyr Stoves, Inc.	View 2.0	4.5	10,700-34,800		63	Non Catalytic

Appendix J

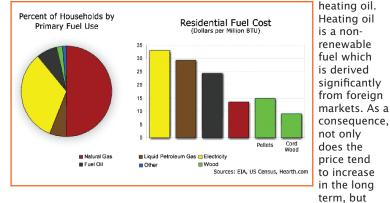
BTEC Residential Heating Fact Sheet

Residential Heating



There are numerous benefits to using biomass instead of fossil fuels like oil, coal, and gas for providing heat for homes, commercial users, and industrial processes.

Space heating represents about 40% of the total energy consumption of the average American home¹. In colder regions such as New England, this number can climb as high as 60% or more. Meaning that the heating choice the homeowners make can have a significant impact on the environment



and their heating bills. One often overlooked option that has the capacity to address both of these issues, is heating with biomass.

Heating Fuels

As with most energy consumptive sectors, the majority of residential heating is currently being met with non-renewable sources, such as natural gas and fuel oil. These fuels are typically combusted in a furnace or boiler, and are the primary source of heat for the whole house. Depending on the appliance, biomass can provide heat to an entire home in much the same way as a conventional furnace; or it can be used as a secondary heating source. Wood burning stoves can provide primary heating for small homes and are an excellent back-up heat source. Currently, there are about 12 million wood stoves being used in American homes for either primary or secondary heating purposes².

Regardless of the size of a biomass appliance, the bottom line is that when in use, it can replace or supplement the consumption of fossil fuels.

Heating Oil

Homeowners use biomass to heat their homes for a variety of reasons, but often cost savings is of the greatest priority. From this standpoint biomass is particularly well suited to displace There are many other reasons that people choose to heat their homes with biomass as well: becoming energy independent, supporting local economies, or reducing their carbon footprint. Many homeowners, however, are simply enamored with the ambiance that wood and pellet stoves provide. Whatever the reason, there are a range of heating appliances on the market which can fulfill the needs of any particular homeowner.

it can also fluctuate dramatically in the short

term; a phenomenon which is becoming more

of heat can mitigate the costs associated with

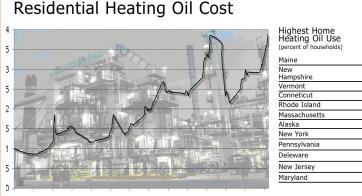
these fluctuations. Heating a home solely with

biomass can rid a homeowner of these pricing

pronounced today than ever before. Using a

wood or pellet stove as a secondary source

fluctuations altogether.



Source: Hearth, Pation, and Barbeque Association (HPBA). Hearth Industry Unit Shipments. 2010.

¹ Energy Information Administration, (2009). Residential Energy Consumption Survey: Home Energy Uses and Costs.

- ² US Census, (2011). American Housing Survey for the United States: 2009.
- ³ The Alliance for Green Heat, (2009). Available at http://www.forgreenheat.org/technology
- ⁴ Environmental Protection Agency Burnwise Program, (2011). Available at http://www.epa.gov/burnwise/appliances.html
- ⁵ Environmental Protection Agency, (2011). List of EPA Certified Wood Stoves.

Appliances^{3,4}

Many people associate wood heating with billowing chimneys and smoky emissions, when in fact visible smoke is merely symptomatic of an inefficient combustion process. Not only have technological advances led to cleaner burning conventional wood stoves, but they have also spawned a new generation of extremely efficient, automated biomass heating appliances.

Fireplaces

Conventional fireplaces represent the lowest efficiency wood burning technology, and are not generally considered a heating appliance at all. Often, it feels warmest directly in front of the fireplace, however the majority of the hot air is being sucked up the chimney. There are, however, a number of models in production which meet EPA's voluntary standard for fireplaces, and are 70% cleaner than older models. A much better option, that lends itself well to older fireplaces, is a fireplace insert; which is essentially a woodstove that fits into the existing space and greatly increases the efficiency of its use by offering more complete combustion and redirecting more heat into the living space.

Wood Stoves

Fireplaces and woodstoves typically burn cordwood, or small logs, an attribute that offers a high degree of fuel cost flexibility, since cordwood can often be purchased locally or self harvested. Modern woodstoves, freestanding units usually made from cast iron or steel,



Example of a freestanding wood stove. Source: harmanstoves. com

are much more efficient than fireplaces. This is due in part to EPA regulations that went into effect in the early 1990's aimed at significantly reducing emissions from new wood stoves. Stoves belonging to this new generation are intrinsically more efficient because in reducing their emissions, they combust more of the materials that would otherwise escape the flue as particulate pollution. Currently, the EPA maintains a list of over 900 models of certified wood stoves from manufactures. These models are offered in a range of sizes, styles and applications, and can provide either primary or secondary heating within the home.

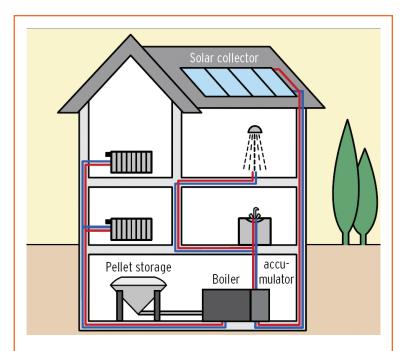
Pellet Stoves

Pellet stoves represent the nexus of convenience, automation, and efficiency. As the name implies, these stoves typically burn wood pellets (uniformly sized condensed biomass) but they can also burn corn kernels. Some units can operate on either type of fuel. The high degree of automation, coupled with the uniform, low-moisture fuel allows for an unprecedented emission profile, high efficiency, and user friendliness. Demand from the user is typically limited to reloading the pellet hopper and intermittently removing ash from the collection bin. Wood and corn pellets can be ordered by the ton and delivered

Zone Heating

Wood and pellet stoves are often categorized as zone heaters, meaning that heat is sourced directly from the appliance into the room and adjacent areas. Installing a stove in the highest used 'zone' of the house allows for the thermostat be turned down for the entire home without compromising comfort. This strategy can significantly shrink heating bills and fossil fuel usage alike.

take advantage of existing ductwork and radiators. Much like pellet stoves, they also can enjoy a high degree of automation which allows for extremely high conversion efficiencies and low emissions. However, many low efficiency and high emission boilers are also available, particularly traditional outdoor wood boilers, and should be avoided. Since pellets have a high energy density and uniformity, their utilization in a central heater is very similar to an oil furnace. The fuel being stored in a bin which is automatically fed into the combustor at the rate required to maintain the temperature dictated



Schematic of a biomass central heating system. Source: Biomass heating in Upper Austria

by the thermostat. The only additional user input that these systems could require is ash removal and refilling the fuel bin as necessary.

The Future of Biomass Heating

Many European countries represent the future potential of residential biomass heating in the United States. Upper Austria, for example, was highly dependent upon heating oil until the emergence of state policies, technological innovation, and forward-thinking forest owners initiated the growth of the its biomass heating market. Today, upper Austria enjoys a

strong pellet distribution network, which fuels tens of thousands of fully automated residential pellet heating systems6. Furthermore, biomass now accounts for 1/3 of the thermal energy use in that region. Meanwhile, pellet production capacity is rapidly expanding in the United States, but so is exportation to European markets. With greater domestic residential heating adoption, the United States can also realize the energy independence,

environmental mitigation, and financial saving that biomass offers.

Conclusion

Using biomass for residential heating is a simple way to reduce fossil fuel consumption while securing a more energy independent home. The variety of choices concerning both appliances and fuel allows for nearly any homeowner to take advantage of the benefits that heating with biomass can provide.

WOOD EDUCATION AND RESOURCE CENTER

The work upon which this publication is based was funded in whole or in part through a grant awarded by the Wood Education and Resource Center, Northeastern Area State and Private Forestry, U.S. Forest Service. This institution is an equal opportunity provider.

This fact sheet is available online at www.biomassthermal.org.

directly to the home, or they can be purchased

by the bag (typically 40 lbs) from a variety of vendors including: stove dealers, hardware, home and garden, and feed supply stores.

Wood Furnaces and Boilers

Wood furnaces and boilers are centralized heating systems and can provide both space and water heating. They are used to heat the entire home in much the same fashion as conventional oil and gas systems, and can even

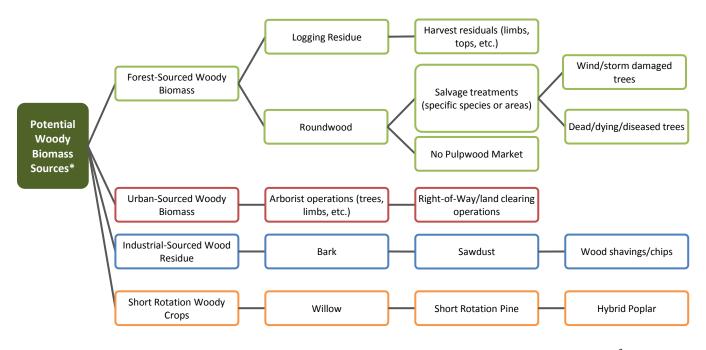


Example of a fully automated wood pellet boiler. Source: wood-boilers.com

Appendix K

Potential Woody Biomass Sources

POTENTIAL WOODY BIOMASS SOURCES



*Adapted from Kittler et al., 2010²

Appendix L

Preliminary List of Public and Private Facilities for Biomass Heating

List of facilities that should be considered for conversion to biomass heating.

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Crawford County Courthouse	Prairie du Chien
Crawford County Admin Bldg	Prairie du Chien
Crawford County Highway Department	Seneca
Crawford County Sheriff's Office	Prairie du Chien
Monroe County Courthouse	Sparta
Monroe County Administrative Center	Sparta
Monroe County Community Services Center	Sparta
Monroe County Highway Office	Sparta
Monroe County Highway Office	Sparta
Monroe County Highway Office	Tomah
Monroe County Highway Office	Wilton
Monroe County Highway Office	Cashton
Monroe County Sheriff's Department	Sparta
Vernon Cnty-Erlandson Office Building	Viroqua
Vernon Memorial Hospital	Viroqua
Courthouse Annex	Viroqua
Vernon Cnty-Land & Water Conservation Bldg	Viroqua
Vernon County Sheriff's Office	Viroqua
Health & Human Services Community Services Building	Richland Center
Richland County Courthouse	Richland Center
Symons Recreation Complex	Richland Center
Richland County Highway Shop	Richland Center
Pine Valley Healthcare and Rehabilitation	Richland Center
Land Conservation Department	Richland Center
LIBRARIES	
Gays Mills Public Library	Gays Mills
Joseph W & Emma L Wachute Memorial Library	Prairie du Chien
Soliders Grove Public Library	Soldiers Grove
Cashton Memorial Library	Cashton
Kendall Public Library	Kendall
Norwalk Public Library	Norwalk
Sparta Free Library	Sparta
Sparta Free Library Tomah Public Library	Sparta Tomah
	•
Tomah Public Library	Tomah
Tomah Public Library Wilton Public Library	Tomah Wilton
Tomah Public Library Wilton Public Library Knutson Memorial Library	Tomah Wilton Coon Valley
Tomah Public Library Wilton Public Library Knutson Memorial Library La Farge New Library	Tomah Wilton Coon Valley LaFarge
Tomah Public Library Wilton Public Library Knutson Memorial Library La Farge New Library DeSoto Public Library	Tomah Wilton Coon Valley LaFarge DeSoto
Tomah Public Library Wilton Public Library Knutson Memorial Library La Farge New Library DeSoto Public Library Hillsboro Public Library	Tomah Wilton Coon Valley LaFarge DeSoto Hillsboro
Tomah Public Library Wilton Public Library Knutson Memorial Library La Farge New Library DeSoto Public Library Hillsboro Public Library Lawton Memorial Library	Tomah Wilton Coon Valley LaFarge DeSoto Hillsboro La Farge
Tomah Public Library Wilton Public Library Knutson Memorial Library La Farge New Library DeSoto Public Library Hillsboro Public Library Lawton Memorial Library Ontario Public Library	Tomah Wilton Coon Valley LaFarge DeSoto Hillsboro La Farge Ontario
Tomah Public Library Wilton Public Library Knutson Memorial Library La Farge New Library DeSoto Public Library Hillsboro Public Library Lawton Memorial Library Ontario Public Library Readstown Public Library	Tomah Wilton Coon Valley LaFarge DeSoto Hillsboro La Farge Ontario Readstown
Tomah Public Library Wilton Public Library Knutson Memorial Library La Farge New Library DeSoto Public Library Hillsboro Public Library Lawton Memorial Library Ontario Public Library Readstown Public Library McIntosh Memorial Library	Tomah Wilton Coon Valley LaFarge DeSoto Hillsboro La Farge Ontario Readstown Viroqua
Tomah Public Library Wilton Public Library Knutson Memorial Library La Farge New Library DeSoto Public Library Hillsboro Public Library Lawton Memorial Library Ontario Public Library Readstown Public Library McIntosh Memorial Library Bekkum Memorial Public Library	Tomah Wilton Coon Valley LaFarge DeSoto Hillsboro La Farge Ontario Readstown Viroqua Westby

SCHOOLS (Public & Private) BA Kennedy School	Prairie du Chie
Bluff View Elementary and Intermediate	Prairie du Chie
Mighty River AcadVirtual Edu	Prairie du Chie
Bible Baptist Academy	Prairie du Chie
Prairie Catholic Schools	Prairie du Chie
Prairie du Chien High School	Prairie du Chie
	Prairie du Chie
Wyalusing Academy	
Seneca Elementary	Seneca
Seneca Jr High School	Seneca
Seneca High School	Seneca
North Crawford Elementary	Soldiers Grove
North Crawford High School	Soldiers Grove
Wauzeka Elementary	Wauzeka
Wauzeka Middle	Wauzeka
Wauzeka High School	Wauzeka
Warrens Walk-In Clinic	Warrens
Gundersen Lutheran Medical Ctr-Sparta	Sparta
Cashton Public Schools - High School	Cashton
Cashton Public Schools - Elementary	Cashton
Cataract Elementary School	Sparta
•	
Sacred Heart School	Cashton
Norwalk-Ontario-Wilton Elementary School	Ontario
Norwalk-Ontario-Wilton High School	Ontario
Sparta Meadowview Schools	Sparta
Cartaract Elementary	Sparta
Lakeview Montessori School	Sparta
Lawrence Lawson Elementary School	Sparta
Maplewood Elementary School	Sparta
Southside Elementary School	Sparta
Sparta High School	Sparta
Administrative and Educational Center	Sparta
	Tomah
Timber PUPS Learning Center	
LaGrange Elementary	Tomah
Lemonweir Elementary	Tomah
Miller Elementary	Tomah
Oakdale Elementary	Tomah
Warrens Elementary	Warrens
Wyeville Elementary	Wyeville
SAILS Sparta Alt Indep Lrn Sch	Sparta
Sparta Mennonite School	Sparta
St. Mary Grade School	Tomah
St. Patrick's Grade School	Sparta
St. Paul Lutheran School	Tomah
Tomah Baptist Academy	Tomah
Tomah Middle School	Tomah
Tomah High School	
5	Tomah
Robert Kupper Learning Center	Tomah
Coon Valley Elementary	Coon Valley
De Soto Middle School	De Soto
De Soto High School	De Soto
Prairie View Elementary School	De Soto
English Lutheran School	Viroqua
Hillsboro Elementary and Middle School	Hillsboro
Hillsboro High School	Hillsboro
La Farge Elementary School	La Farge
La Farge Middle School	La Farge
La Farge High School	
	La Farge
St. Charles Elementary School	Genoa
St. Matthews Lutheran School	Stoddard
Stoddard Elementary	Stoddard
Kickapoo ElementarySchool	Viola
Kickapoo High School	Viola
Pleasant Ridge Waldorf School	Viroqua
Viroqua Elementary School	Viroqua
Viroqua Middle School	Viroqua
Viroqua High School	Viroqua
Youth Initiative High School	Viroqua
Cornerstone Christian Academy	Viroqua
•	
Westby Elementary School	Westby
Westby Middle School	Westby
Westby High School	Westby
Doudna Elementary	Richland Cente
Ithaca Elementary, Middle and High School	Richland Cente
thaca High School	Richland Cente
Lincoln Elementary	Richland Cente
•	Richland Cente
Richland Middle School	

MEDICAL FACILITIES & NURSING HOMES/RESIDENTIAL CARE FA	CILITIES
Franciscan Skemp Health Care Prairie du Chien Clinic	Prairie du Chien
Gundersen Lutheran Prairie du Chien Clinic	Prairie du Chien
Prairie du Chien Memorial Hospital	Prairie du Chien
Prairie Health Care Center	Prairie du Chien
Scenic Bluffs CommunityHealth	Cashton
Franciscan Skemp Health Care - Lake Tomah Clinic	Tomah
Gundersen Lutheran-Tomah Clinic	Tomah
Scenic Bluffs Community Center-Norwalk	Norwalk
Mayo Clinic Health System - Franciscan Health Care in Sparta	Sparta
Tomah Memorial Hospital	Tomah
Rolling Hills Rehabilitation Center	Sparta
Tomah Nursing and Rehabilitation Center	Tomah
Morrow Memorial Home	Sparta
Sannes Skogdalen	Soldiers Grove
Gundersen Lutheran Hillsboro Clinic	Hillsboro
Gundersen Lutheran Viroqua Clinic	Viroqua
LaFarge Medical Clinic	La Farge
Hirsch Clinic	Viroqua
Bland Clinic	Westby
Viola Health Services	Viola
Gundersen St. Joseph's Hospital and Clinics Hillsboro	Hillsboro
Kickapoo Valley Medical Clinic	Soldiers Grove
St. Joseph's Nursing Home	Hillsboro
Bethel Home and Services, Inc.	Viroqua
Vernon Manor	Viroqua
Norseland Nursing Home	Westby
Bethany Parkside Elderly Group Home	La Farge
Davis Duehr Dean - Richland Center	Richland Center
The Richland Hospital, Inc.	Richland Center
Schmitt Woodland Hills, Inc.	Richland
Richland Medical Center LTD	Richland Center

HIGHER LEARNING CENTERS	
Upper Iowa University- PDC Campus	Prairie du Chien
Western Technical College - Tomah Campus	Tomah
Western Wis Technical College - Viroqua Campus	Viroqua
University of Wisconsin-Richland	Richland Center

STATE/FEDERAL FACILTIES	LOCATION
National Guard Armory - PDC	Prairie du Chien
Tomah VA Medical Center	Tomah
Fort McCoy Fire Department	Fort McCoy
Veterans Administration	Tomah
Fort McCoy	Fort McCoy
Prairie du Chien Correctional Institute	Prairie du Chien
National Guard Armory-Viroqua	Viroqua
Kickapoo Reserve Visitors Center	La Farge

INDUSTRY	
Organic Valley	Vernon
Gile Cheese-Carr Cheese Factory	Grant
Mt. Sterling Cheese Co-op	Crawford
K&K Cheese	Monroe
Old Country Cheese	Monroe
Morning Glory Farms	Vernon
Westby Co-op Creamery	Vernon
Three Bears Resort	Monroe

Biomass Thermal Utilization (BTU) Act of 2013 (S. 1007, H.R. 2715) Co-sponsors: Senators King (I-ME), Collins, (R-ME), Shaheen (D-NH), Franken (D-MN), Merkley (D-OR), and Sanders

Co-sponsors: Senators King (I-ME), Collins, (R-ME), Shaheen (D-NH), Franken (D-MN), Merkley (D-OR), and Sanders (I-VT), and Representatives Michaud (D-ME2), Welch (D-VT), Gibson (NY-19), Kuster (NH-2), Nolan (MN-8), and Owens (NY-21)

What is thermal biomass?	A thermal biomass system is a stove, furnace or boiler that runs on biomass fuels such as wood pellets and chips, solid wood or agricultural residues. The system produces thermal energy for heating residential, commercial and industrial buildings, as well as process heat for industrial applications. Wood pellets, chips and solid wood are the most common fuels for biomass heating systems, although agricultural wastes will see growth in the future. Wood pellets are generally made from wood waste, condensed under heat and pressure, with no additives. They have high energy density, low moisture content, and are as easy to transport and use as traditional fossil fuels. Wood chips offer a	slightly less refined form of biomass fuel, but also allow for easy transport and storage. Advanced combustion technologies allow the use of biomass fuels with very high efficiencies and low emissions. Leading technologies have been developed in Europe, but are now entering the U.S. market. Domestic U.S. manufacturers are also developing advanced technologies.
What are the economic and environmental benefits of renewable thermal biomass?	These technologies utilize fuels and feedstocks that support forest- and agricultural-based economic development in rural regions. Many rural regions are dependent on imported fossil heating fuels such as oil and propane, and do not have access to natural gas. Locally produced biomass fuels can displace dependence on these expensive imported fuels, thereby keeping fuel dollars local and greatly reducing heating costs. Wood pellet and chip manufacturing, as well as dedicated production of agricultural feedstocks for thermal applications can help revitalize economies in	regions that have been impacted by decline in forest industry or agriculture. Biomass thermal creates and helps retain JOBS. Biomass fuels are low carbon and result in net reduction of greenhouse gas emissions when displacing high carbon intensity fuels such as heating oil. In addition, the use of wood fuels reduces sulfur emissions that contribute to acid rain. The use of biomass fuels produced in America helps strengthen American energy independence and security.
Why is the BTU Act important?	The BTU Act adds high efficiency biomass thermal technologies to the list of renewable energy technologies that current benefit from investment tax credits under section 25D (residential) and Section 48 (commercial/industrial) of the tax code. This investment credit currently applies to solar thermal and geothermal technologies, but not to biomass thermal. The BTU Act corrects this oversight. The BTU Act only qualifies the most efficient and advanced technologies for the credit. Investment credits are needed for advanced biomass thermal technologies because of their comparatively	high up front capital cost. This "capital hurdle" must be overcome to build the market and gain economies of scale that will bring system costs down. Similar policy has been very effective in reducing the cost of solar (PV and thermal) and geothermal technologies.
Who supports the BTU Act?	Alliance for Green Heat American Boiler Manufacturers Association American Forest Foundation Aroostook Partnership for Progress Biomass Energy Resource Center Biomass Thermal Energy Council Central Oregon Intergovernmental Council Development Council Forest Guild Hardwood Federation Heating the Midwest with Renewable Biomass International District Energy Association Maine Pellet Fuels Association Mt. Adams Resource Stewards	National Association of Forest Service Retirees National Association of State Foresters National Network of Forest Practitioners New York Biomass Energy Alliance North Country Resource Conservation and Development Council Northeast Biomass Thermal Working Group Northern Forest Center Oregon Department of State Forestry Pellet Fuels Institute Pennsylvania Biomass Energy Association Society of American Foresters Sustainable Northwest Vermont Energy Investment Corporation Watershed Research & Training Center

Biomass Thermal Utilization (BTU) Act of 2013

Senator Angus King

Summary

The BTU Act of 2013 seeks to recognize and promote the many economic and environmental benefits that biomass thermal energy provides by opening the door to two sections of the Internal Revenue Code that already incentivize renewable energy. Currently, a host of renewable energy technologies qualify for investment tax credits for capital costs incurred in residential and commercial installations. Simply, this legislation seeks to achieve parity between thermal biomass and other renewable systems.

Section 1: The title underscores that heat from biomass is an underutilized energy source in this country. Converting biomass—in the form of agricultural crop waste, wood chips, pellets or sawmill residuals—into thermal energy is one of the most efficient uses of this resource. Biomass heating systems now entering the marketplace operate at efficiency levels of 80 percent or higher.

Section 2, Residential Tax Credit: This provision adds biomass fuel property to the list of existing technologies that qualify for the residential renewable energy investment tax credit in Section 25d of the Internal Revenue Code. To qualify, the biomass fuel property must operate at a thermal efficiency rate of at least 75 percent and be used to either heat space within the dwelling or heat water.

Included in this section is a broad definition of "biomass fuel." The term applies both to agricultural and woody biomass, wood processing residues and wastes and grasses. Essentially, any plant derived fuel that is available on a recurring and renewable basis is eligible, including densified biomass fuel.

This provision would apply to expenses incurred in years following 2013. The existing 25d tax credit expires at the end of 2016.

Section 3, Industrial Investment Tax Credit: This provision adds open-loop biomass heating property to the list of existing technologies that qualify for the commercial renewable energy investment tax credit in Section 48 of the Internal Revenue Code. Qualifying biomass heating property must operate at thermal output efficiencies of at least 65 percent (higher heating value) and be used to generate heat, hot water, steam or industrial process heat.

The credit specified in this section is two tiered. For those technologies that operate at thermal output efficiencies between 65 percent and 80 percent, the investment tax credit is limited to 15 percent of installed capital cost. Technologies operating at thermal output efficiencies greater than 80 percent would be eligible for the full 30 percent investment tax credit under Section 48.

The existing section 48 investment tax credit expires at the end of 2016.

113TH CONGRESS 1ST SESSION

To amend the Internal Revenue Code of 1986 to include biomass heating appliances for tax credits available for energy-efficient building property and energy property.

IN THE SENATE OF THE UNITED STATES

Mr. KING introduced the following bill; which was read twice and referred to the Committee on _____

A BILL

- To amend the Internal Revenue Code of 1986 to include biomass heating appliances for tax credits available for energy-efficient building property and energy property.
 - 1 Be it enacted by the Senate and House of Representa-
 - 2 tives of the United States of America in Congress assembled,

3 SECTION 1. SHORT TITLE.

- 4 This Act may be cited as the "Biomass Thermal Uti-
- 5 lization Act of 2013" or the "BTU Act of 2013".

1	SEC. 2. RESIDENTIAL ENERGY-EFFICIENT PROPERTY
2	CREDIT FOR BIOMASS FUEL PROPERTY EX-
3	PENDITURES.
4	(a) Allowance of Credit.—Subsection (a) of sec-
5	tion 25D of the Internal Revenue Code of 1986 is amend-
6	ed—
7	(1) by striking "and" at the end of paragraph
8	(4),
9	(2) by striking the period at the end of para-
10	graph (5) and inserting ", and", and
11	(3) by adding at the end the following new
12	paragraph:
13	"(6) 30 percent of the qualified biomass fuel
14	property expenditures made by the taxpayer during
15	such year.".
16	(b) Qualified Biomass Fuel Property Expendi-
17	TURES.—Subsection (d) of section 25D of the Internal
18	Revenue Code of 1986 is amended by adding at the end
19	the following new paragraph:
20	"(6) Qualified biomass fuel property ex-
21	PENDITURE.—
22	"(A) IN GENERAL.—The term 'qualified
23	biomass fuel property expenditure' means an
24	expenditure for property—
25	"(i) which uses the burning of bio-
26	mass fuel to heat a dwelling unit located in

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1	the United States and used as a residence
2	by the taxpayer, or to heat water for use
3	in such a dwelling unit, and
4	"(ii) which has a thermal efficiency
5	rating of at least 75 percent (measured by
6	the higher heating value of the fuel).
7	"(B) BIOMASS FUEL.—For purposes of
8	this section, the term 'biomass fuel' means any
9	plant-derived fuel available on a renewable or
10	recurring basis, including agricultural crops and
11	trees, wood and wood waste and residues,
12	plants (including aquatic plants), grasses, resi-
13	dues, and fibers. Such term includes densified
14	biomass fuels such as wood pellets.".
15	(c) EFFECTIVE DATE.—The amendments made by
16	this section shall apply to expenditures paid or incurred
17	in taxable years beginning after December 31, 2013.
18	SEC. 3. INVESTMENT TAX CREDIT FOR BIOMASS HEATING
19	PROPERTY.
20	(a) IN GENERAL.—Subparagraph (A) of section
21	48(a)(3) is amended by striking "or" at the end of clause
22	(vi), by inserting "or" at the end of clause (vii), and by
23	inserting after clause (vii) the following new clause:
24	"(viii) open-loop biomass (within the
25	meaning of section $45(c)(3)$) heating prop-

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1	erty, including boilers or furnaces which
2	operate at thermal output efficiencies of
3	not less than 65 percent (measured by the
4	higher heating value of the fuel) and which
5	provide thermal energy in the form of heat,
6	hot water, or steam for space heating, air
7	conditioning, domestic hot water, or indus-
8	trial process heat, but only with respect to
9	periods ending before January 1, 2017,".
10	(b) 30 Percent and 15 Percent Credits.—
11	(1) IN GENERAL.—Subparagraph (A) of section
12	48(a)(2) is amended—
13	(A) by redesignating clause (ii) as clause
14	(iii),
15	(B) by inserting after clause (i) the fol-
16	lowing new clause:
17	"(ii) except as provided in clause
18	(i)(V), 15 percent in the case of energy
19	property described in paragraph
20	(3)(A)(viii), and", and
21	(C) by inserting "or (ii)" after "clause (i)"
22	in clause (iii), as so redesignated.
23	(2) INCREASED CREDIT FOR GREATER EFFI-
24	CIENCY.—Clause (i) of section $48(a)(2)(A)$ is
25	amended by striking "and" at the end of subclause

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1	(III) and by inserting after subclause (IV) the fol-
2	lowing new subclause:
3	"(V) energy property described in
4	paragraph (3)(A)(viii) which operates
5	at a thermal output efficiency of not
6	less than 80 percent (measured by the
7	higher heating value of the fuel),".
8	(c) Effective Date.—The amendments made by
9	this section shall apply to periods after the date of the
10	enactment of this Act, in taxable years ending after such
11	date, under rules similar to the rules of section 48(m) of
12	the Internal Revenue Code of 1986 (as in effect on the
13	day before the date of the enactment of the Revenue Rec-
14	onciliation Act of 1990).





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