

US REGULATIONS AND RULES FOR WOOD STOVES

Fagligt seminar 2019:

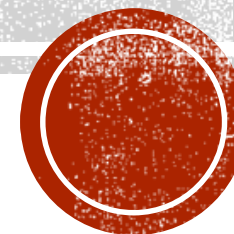
Biomassekedler og
brændeovne

Aarhus, Denmark 6/12/19

John Ackerly
President



ALLIANCE
FOR GREEN HEAT
low carbon, renewable and local



STATE & FEDERAL REGULATION TIMELINE

- **1986** Oregon was first US state to regulate wood stoves
- **1988** EPA adopts first NSPS, regulating at the federal level – 7.5 grams an hour
- **1995** Washington state adopts 4.5 grams an hour
- **2015** EPA enacts Step 1, at 4.5 grams an hour for wood and pellet stoves for the entire country (Boilers and furnaces also have Step 1 standards.)
- **2020** Step 2 of the NSPS takes effect at 2 grams/hr for cribs and 2.5 grams for cordwood
- **2023** EPA could/should undertake another NSPS in 2023, but likelier date may be to finalize it in 2024, 2025 or later.



FOR NOW, FEDERAL RULES PREVAIL

Clean Air Act.

- In 1963, Congress passed the Clean Air Act, but let each state set their own limits.
- In 1970, Congress said EPA should set minimum Uniform Standards for county.

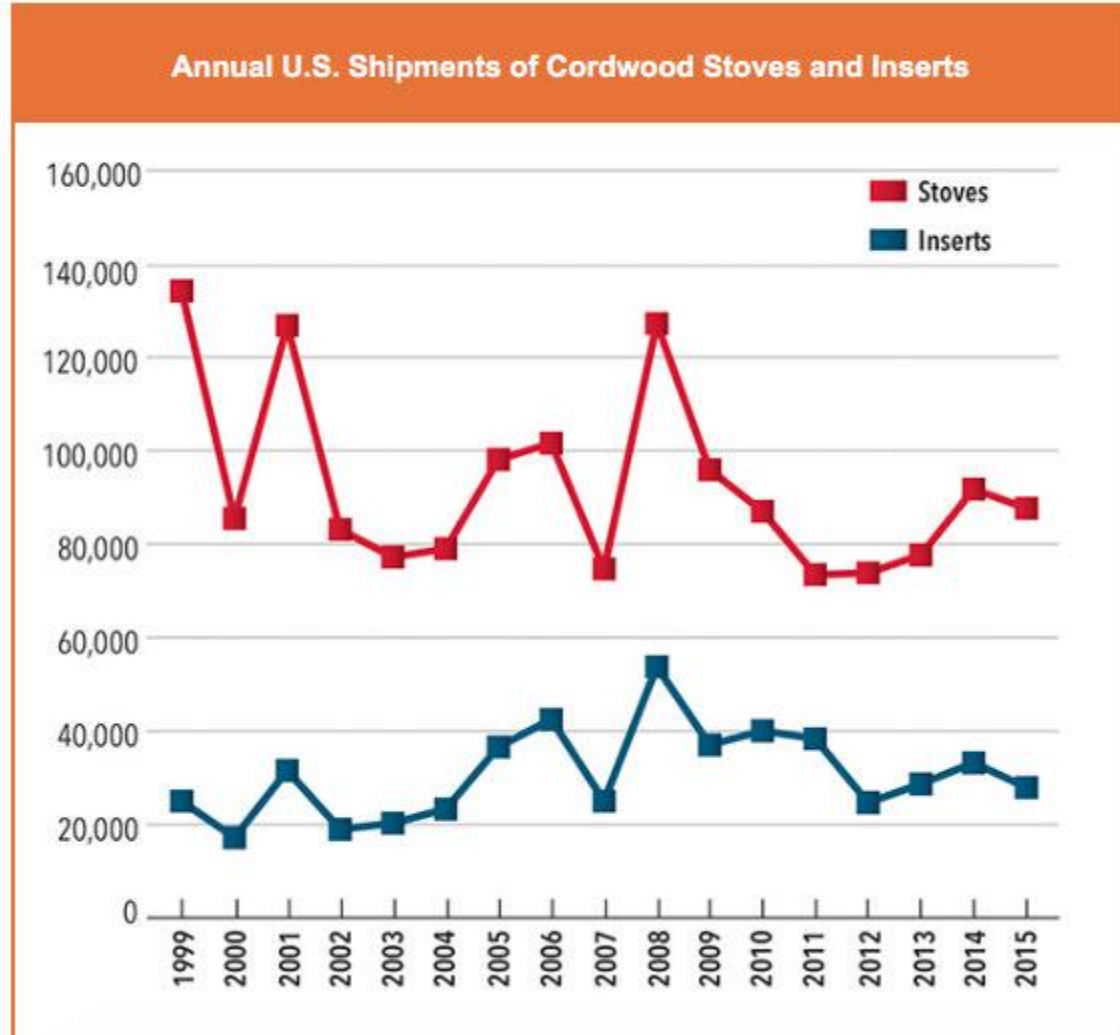
Wood Heater Emission standards

- Currently, there are no stricter state-wide emission regulations for stoves.
- If the EPA gives an additional 2-year sell-through for boilers or stoves, some states could stick to the original timeline and not allow any sell-through in their states.
- Washington state's stricter emission standard of 4.5 grams an hour disappeared in 2015 when the EPA/feds moved to 4.5.
- Different regulations at the state level aimed at reducing uncertified stoves
 - Washington and Oregon State requires that only certified stoves be installed – in effort to ban installation of 2d hand, uncertified stoves.
 - State of Oregon and some cities requires that uncertified stoves are removed upon sale of the home.

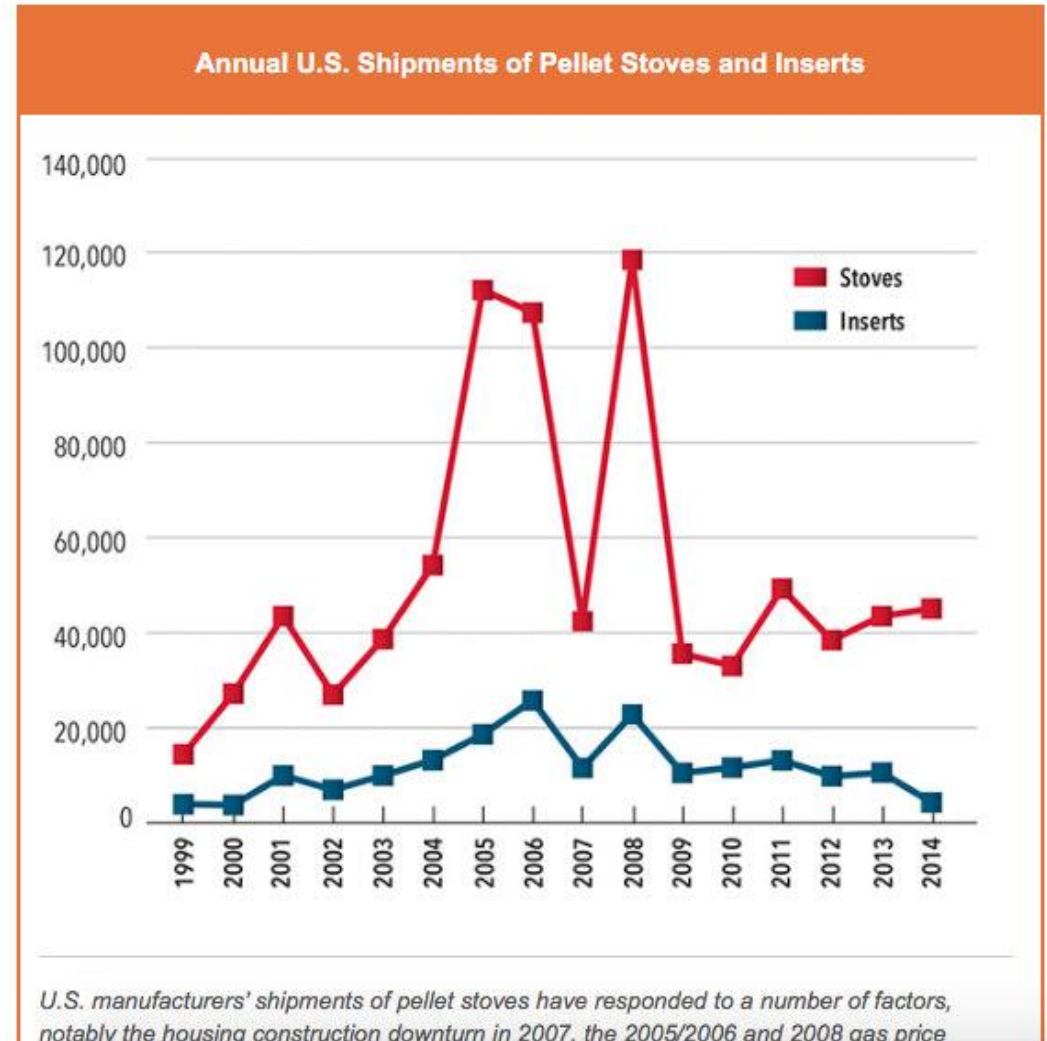


Stove Shipments: Combined annual shipments of wood and pellets stoves range between more than 300,000 to around 150,000. Data provided by HPBA. (HPBA stopped gathering and providing this data.)

Wood stoves



Pellet stoves

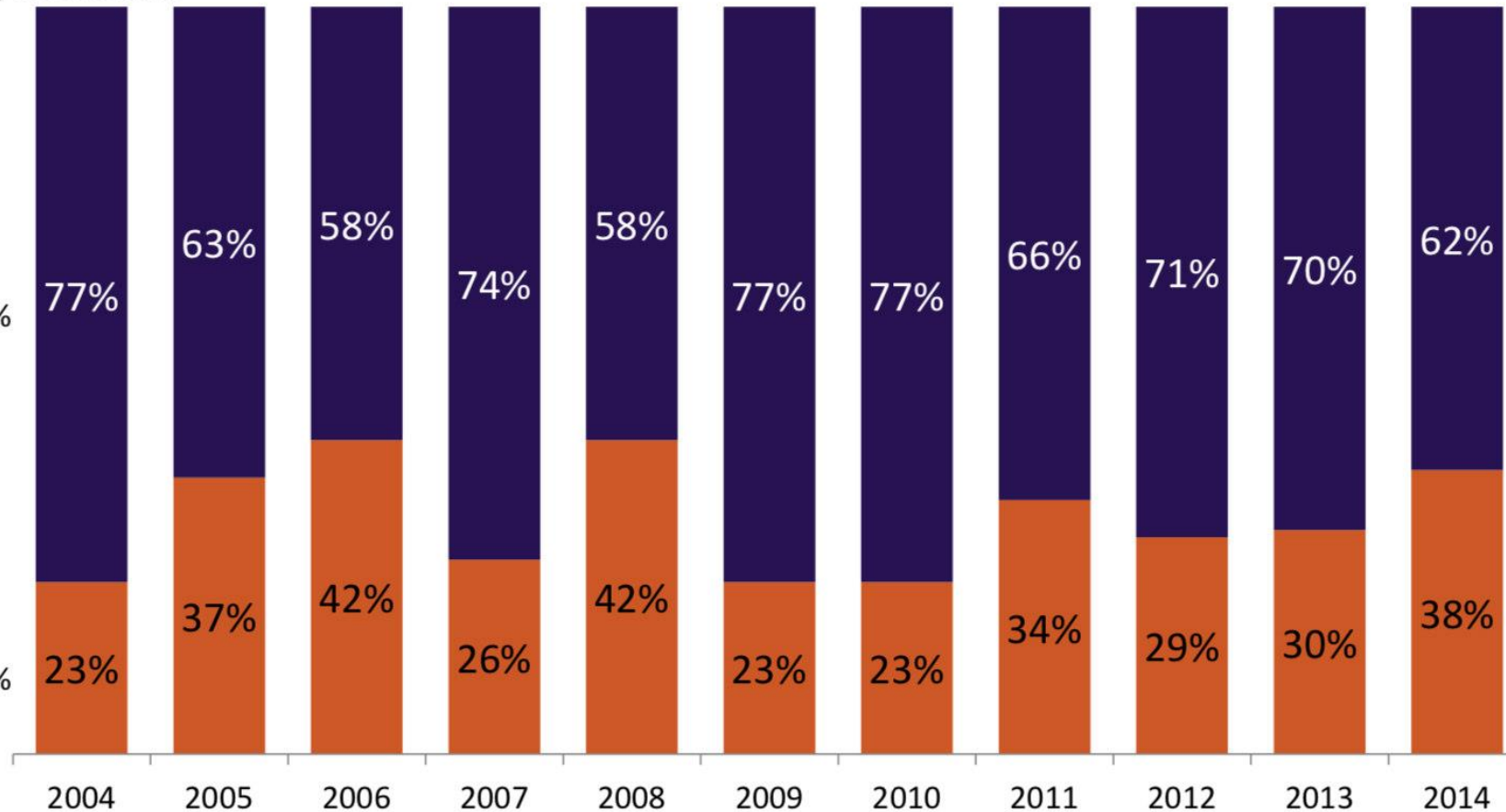


Freestanding Pellet Stoves remains around one-third of all U.S. Stove Shipments

Freestanding Stoves Units

Avg Time
Average: 68%

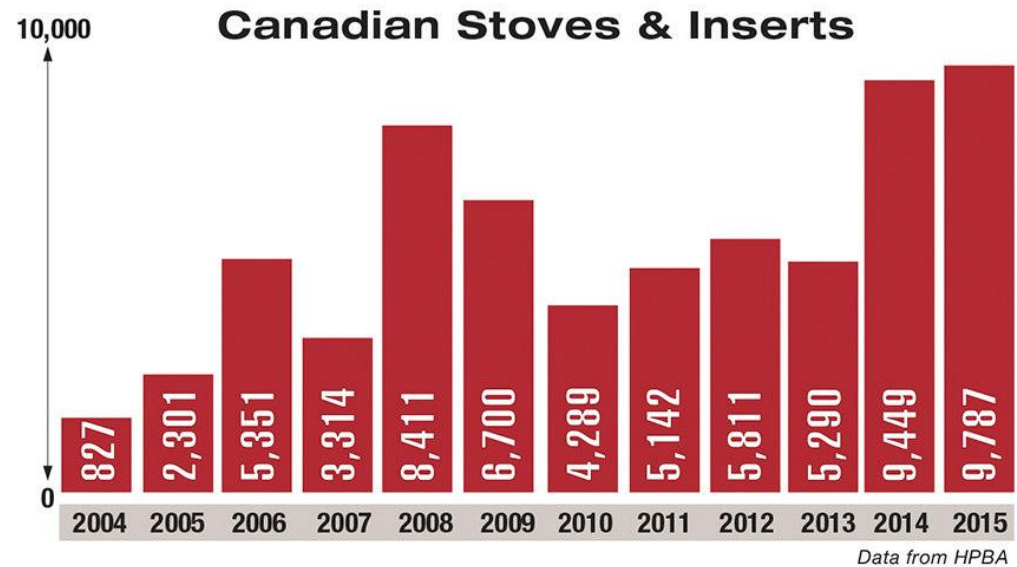
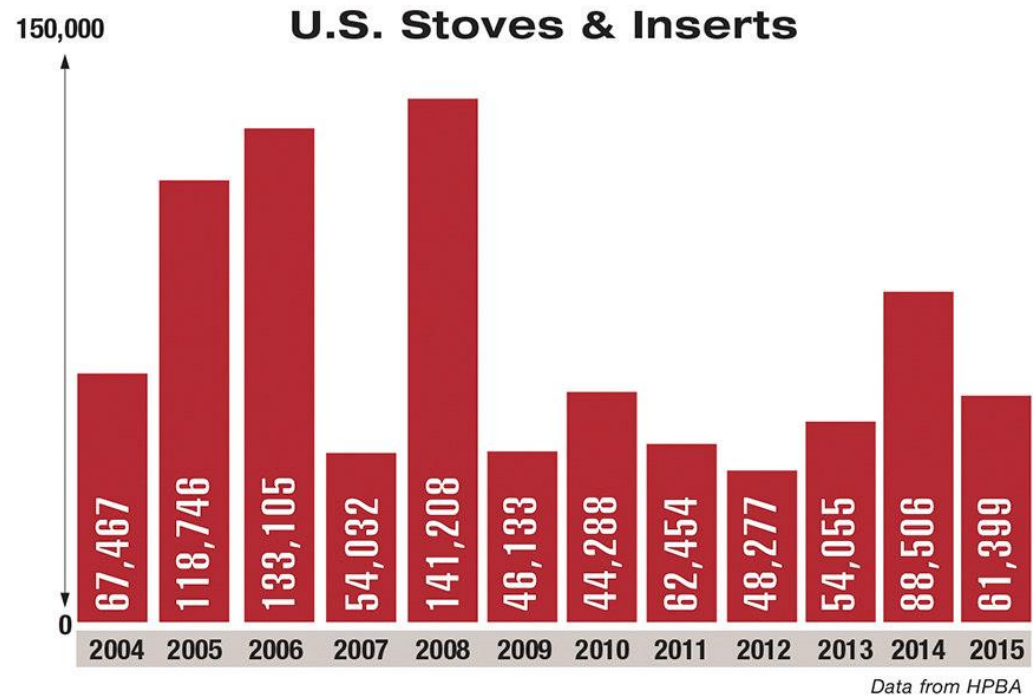
Avg Time
Average: 32%



■ Freestanding Stove (Cordwood/Gas) Units

■ Pellet Units

Shipments of Pellet Appliances



2015 WOOD HEATER NSPS

■ **Covers:**

- Heaters that use wood or wood pellets, such as ...
- New wood and pellet stoves, boilers and furnaces

■ **Does NOT cover:**

- Existing heaters already in homes
- Cook stoves (if oven and cooktop are certain sizes and meet other criteria)
- Masonry heaters
- Coal or corn stoves (or gas or oil)
- Fireplaces (that are not advertised as heaters)
- Pizza ovens, BBQs, chimeneas, sauna or hot tub stoves

In or out?

- Masonry heaters want to be regulated, but EPA says they are too small
- Coal stove manufacturers do not want to be regulated
- Some fireplace makers want regulation
- Fireplace inserts are covered if they advertise as heaters.



Table 2-1. Entities and Appliances Subject to the Rule

Entities Subject to Rule	Residential Wood-Burning Heaters Subject to Rule's Emission Limits		Appliances not Subject to Rule's Emission Limits
	Subpart AAA	Subpart QQQQ	
Manufacturers (of heaters subject to rule) including NAICS codes 333414 and 333415	Noncatalytic stoves	Indoor hydronic heaters (“wood boilers”)	Wood heaters already in use in homes
	Catalytic stoves	Outdoor hydronic heaters (“outdoor wood boilers”)	Non wood-burning heaters (<i>e.g.</i> , gas-only, oil-only, coal-only, corn-only)
	Hybrid stoves		
Test Laboratories (of heaters subject to rule) including NAICS code 541380 as applicable	Pellet stoves	Forced-air furnaces (“warm air furnaces”)	Masonry heaters
	Single burn rate stoves		Fireplaces, Cook stoves, Camp stoves, Pizza ovens, Fire pits, Barbecues, Chimineas, Traditional Native American bake ovens
Third-Party Certifiers (of heaters subject to rule)	Multi-fuel stoves if one fuel is wood	Multi-fuel central heaters if one fuel is wood	Heaters used only for Research and Development
Owners and Operators (of heaters subject to rule)	Other wood-burning stoves functioning as residential room / space heaters (<i>e.g.</i> , innovative design yet to be manufactured)	Other wood-burning heaters functioning as residential central heaters (<i>e.g.</i> , innovative design yet to be manufactured)	Export-only heaters
Retailers, Wholesalers, Importers and Distributors (of heaters subject to rule)			Heaters used to heat <i>only</i> commercial

Terminology

- Subpart AAA, the stove rules referred to as “Triple A”
- Subpart QQQQ, the boiler rules, referred to as “Quad Q”



LABS & THIRD PARTY CERTIFIERS

EPA-approved Test Labs and Third-party Certifying Entities for 2015 Residential Wood Heaters NSPS

Name	EPA-approved Test Lab ¹			EPA-approved Third-Party Certifier ²			Expiration Date of EPA Approval
	Wood Stove	Forced-Air Furnace	Hydronic Heater	Wood Stove	Forced-Air Furnace	Hydronic Heater	
PFS-TECO (formerly Dirigo Laboratories)	Yes	Yes	Yes	Yes	Yes	Yes	02/05/2023
Intertek	Yes	Yes	Yes	Yes	Yes	Yes	10/30/2020
OMNI	Yes	Yes	Yes	Yes	Yes	Yes	10/08/2020
Polytests Inc.	Yes	Yes	Yes	No	No	No	10/30/2020
PFS Corp.	No	No	No	Yes	Yes	Yes	11/04/2020
CSA Group	No	No	No	Yes	Yes	Yes	11/03/2020
UL, LLC	No	No	No	Yes	Yes	Yes	11/12/2020
Research Institutes of Sweden (RISE)	Yes	Yes	Yes	Yes	Yes	Yes	11/14/2022
ClearStak, LLC	Yes	Yes	Yes	No	No	No	11/07/2021
SZU	Yes	Yes	Yes	Yes	Yes	Yes	04/17/2022
Danish Technological Institute	Yes	Yes	Yes	No	No	No	11/22/2022
Guardian Fire Testing Laboratories, INC	No	No	No	Yes	Yes	Yes	04/25/2024

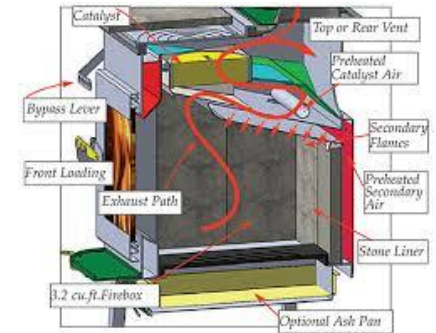
Key points

- The 2015 rule added a “Certifying-Body-Based Certification Process”
- Third party certifiers review test data and may certify initial compliance and submit application to the EPA.
- Only the EPA can issue the certificate
- Third party certifiers conduct unannounced audits on compliance with quality control plans.
- The lab and 3rd party certifier can be the same.



TECHNOLOGY IMPACT OF 2015 REGS

- **More catalysts/hybrid.** Many companies adding catalysts in addition to secondary air tubes. A few, like Jotul and MF Fire have the catalyst continually engaged, including during start-up.
- **Single burn rate.** Instead of the traditional variable burn rate, tested at 4 levels, some stoves have no control and can use a single, higher burn rate. These stoves are NOT approved for use with a flue damper.
- **Automated stoves.** Stoves with sensors to control air flow can be tested as single burn rate stoves, and still allow user to adjust heat output. This has not
- **Fewer models** on the market
- **Higher efficiencies**, especially in pellet stoves
- **Prices** should rise for most models but it may be much less than some expected.



EPA 2020 CERTIFICATION

QUADRA-FIRE
NOTHING BURNS LIKE A QUAD

EPA 2020 CERTIFIED PRODUCTS*



PRODUCTS BEING EPA 2020 CERTIFIED AFTER MAY 15, 2020



PRODUCTS BEING EPA 2020 CERTIFIED IN 2019



PRODUCTS BEING OBSOLETED



Example of the 2015 stove regulations on one large stove company: Quadrafire.

- 6 out of 34 are 2020 compliant
- 13 out of 34 obsolete
- 3 out of 34 will be compliant later in 2020



* As of 5/6/19



EPA INITIATES CHANGES TO 2015 NSPS

- Starting in Jan. 2017, Industry lobbied the newly elected Trump administration to weaken the 2015 Obama era stove and boiler regulations.
- **Role of states.** State governments and environmental groups opposed changes to the 2015 NSPS. No Republican led state government joined industry to support changes.
- **Sell-though.** The EPA only appears to be considered sell-throughs, not extensions or changes to emission standards. A 2-year sell-through would allow retailers to keep selling Step 1 stoves and/or boilers in stock up to 4.5 gr/hr, but manufacturers cannot make or ship Step 1 stoves or boilers after May 15, 2020.
- **Timetable.** To be effective, EPA should have announced changes in 2017 or 2018. With the Step 2 deadline of May 2020 quickly approaching, industry must prepare and assume there will be no changes.



HPBA LAWSUIT AGAINST EPA ON HOLD

- **Legal action:** After the 2015 NSPS HPBA sued the EPA. That lawsuit is on hold in District Court for the time being, as the EPA considers making adjustments to the NSPS.
- **Congress:** HPBA unsuccessfully lobbied Congress for a 3 year extension, allowing manufacturers to make, and retailers to sell stoves up to the Step 1 level of 4.5 grams an hour. No current Congressional push.
- Lawsuit does NOT challenge the 2 gram Step 2 standard for wood stoves.
 - It does challenge the Step 2, 2.5 gram standard for cordwood stoves, saying the EPA did not have sufficient evidence (but 2.5 grams using the ASTM standard seems to be working.)
 - It challenges the Step 2 boiler and furnace emission standards
 - It challenges the compliance testing provisions.



HPBA LAWSUIT #2

- **Challenges Compliance Audit Testing**
- The NSPS says the EPA can randomly choose a stove, select any third party lab, and retest the stove. Audit also inspects stove to ensure it hasn't been altered since it was originally tested. The manufacturer pays and if the stove does not pass the emission standard, the certification can be revoked.
- HPBA wants the manufacturer to choose the test lab and could be same one that tested it originally.
- EPA can revoke certificate if compliance testing produces 50% more emissions than certification testing.
- Most states want to require that a different lab conduct the audit test.



HPBA'S 5 SURVIVAL TIPS FOR RETAILERS

1. **Believe the facts not the hype.** On one extreme, some say the industry is going to be destroyed; on other extreme, some say just do business as usual. Truth is somewhere in between. Prepare for it NOW.
2. **Prepare your inventory now.** Take an inventory of all stoves in your stock and know which ones need to be sold by May 15, 2020. Work with your suppliers to help manufacturers sell Step 1 products and sell yours.
3. **Be prepared for the discounts that are coming.** Be prepared for an all-out discount war beyond anything you have ever seen. Its going to be a race to the bottom. Be diversified and invest in gas products too.
4. **Beware of manufacturers who are taking short-cuts.** Just because a produce is 2020 certified doesn't mean it will perform well in the field. Don't let your business and your customers be guinea pigs for products that are not field ready. Partner with reputable manufacturers.
5. **Get the latest scoop from HPBA.** HPBA knows exactly what's happening and wants to keep you in the loop. Attend the government affairs meeting at the HPBA Expo.



EPA UNVEILS SEARCHABLE DATABASE

<https://cfpub.epa.gov/oarweb/woodstove/index.cfm?fuseaction=app.about>

- Gives consumers tool to more easily search for cleanest & most efficient.
- If you are a manufacturer, you need to check new list for accuracy.
- Consumers unfamiliar with technical term “crib wood” and stoves tested with cordwood may see a sales boost.

2020 Compliant Fast facts

- 151 wood and pellet stoves
- Median pellet stove is 75% efficient or higher.
- Almost half of wood stoves are catalytic
- 23 tested with cordwood
- 9 stoves listed as hybrid (cat & not-cat)

Quick Searches

Most Efficient

[more info](#)

Cleanest

[more info](#)

Previously EPA Certified

[more info](#)

Search Terms

Manufacturer

Type


Subtype

Certified Fuel Type ☒ - any -
☐ Cord Wood
☐ Crib Wood
☐ Densified Firelogs
☐ Wood Chips
☐ Wood Pellets



CERTIFICATES AND TEST REPORTS

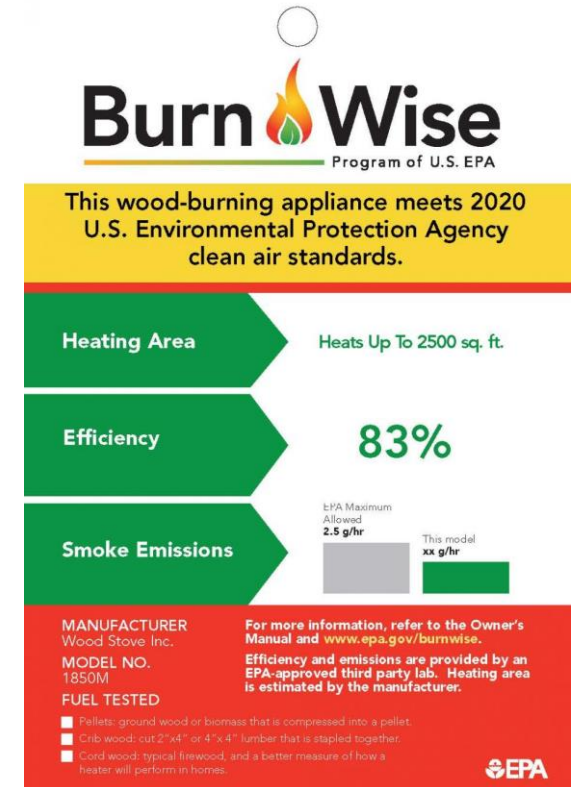
- Once a stove is certified, it receives a certificate that is good for 5 years, which can be updated without any retesting every 5 years, indefinitely. Some models tested in the early 1990s under 4.5 grams an hour are still being sold, but must be retested under 2 grams prior to May 2020 to remain on market.
- Certification test reports must be put on website of stove manufacturers. Known as “Non-CBI test reports,” meaning the information that is not confidential business information.

TEST REPORT	
	REPORT NUMBER: 102330677MID-002 REPORT DATE: December 21, 2015
	EVALUATION CENTER Intertek Testing Services NA Inc. 8431 Murphy Drive Middleton, WI 53562
	RENDERED TO LMF MANUFACTURING 900 PARK AVENUE WOOLRICH, PA 17779
	PRODUCT EVALUATED: MODEL B100 PELLET FUEL ROOM HEATER
	Report of Testing Model B100 Pellet Fuel Room Heater for compliance as an "Affected Wood Heater" with the applicable requirements of the following criteria: EPA 40 CFR Part 60 "Standards of Performance for New Residential Wood Heaters, New Residential Hydronic Heaters and Forced-Air Furnaces", March 16, 2015.
<small>This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to copy or distribute this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.</small>	



ECO-LABELS AND HANG-TAGS

- The United States has NO eco-label. Industry has generally opposed non-governmental eco-labels.
- Energy Star, the key government label does typically not add appliances without industry support – and has not done renewable energy equipment.
- The EPA hang tags, shown on right, helped consumers easily see more efficient appliances, but hang tags will go away after May 2020, except for heaters certified with cordwood.



INCENTIVE PROGRAMS

- Currently, there are no federal incentives for biomass heating equipment
- The federal tax credit may be reinstated at \$400 for stoves and boilers that are 73% HHV efficient or higher, moving to 75% in 2020. A \$400 tax credit helps sell some stoves but probably a majority of sales do not hinge on whether heater is eligible for the tax credit.
- A new tax credit or rebate could use a 75% HHV eligibility limit and it could be worth \$1,000 or more, if legislation passes. But they would have to be installed as part of a larger retrofit and probably would not drive large sales.
- Five northeastern states – MA, ME, NH, NY, VT – have provided incentives in the \$3,000 - \$10,000 range for automated pellet boilers.
- There are 20 – 30 mostly small scale change out programs that help sell new wood and pellet stoves.



INCENTIVE PROGRAMS #2

Stove incentives

- Many incentive and change out programs used to require stricter emission limits, like 2 or 3 grams. But with 2020 limit of 2, no program has any stricter emission limit.
- Some states require minimum of 70% efficiency.

Change out programs

- Many are seasonal and funding levels change from year to year
- Require trading in old stoves and professional installation

Boilers

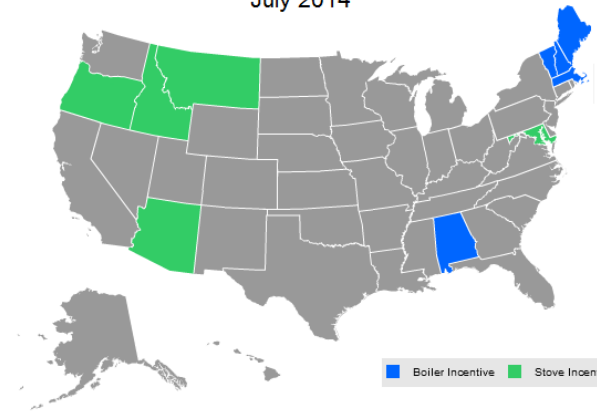
- Most programs restricted to pellet boilers.

Table 4. Northeast State Clean Unit Purchase Incentives

State	Stove Rebate/Incentive	Boiler Rebate/Incentive
Maine	\$500	Up to \$3,000 ⁶
Massachusetts	\$1,000-\$1,500	Up to \$12,000 ⁷
New Hampshire	None	Up to \$10,000 ⁸
New York	\$1,500	Up to \$21,000 ⁹
Vermont	\$800-\$1,000	Up to \$7,000 ¹⁰

Incentive Policies for Wood and Pellet Stoves and Boilers

July 2014



Prepared by the Alliance for Green Heat



35 CHANGE-OUT PROGRAMS IN 2017

YELLOW STARS: CHANGE-OUT PROGRAM; **RED CIRCLES:** INCENTIVE PROGRAMS



CRIB & CORDWOOD


- **Crib wood** testing still dominates, but manufacturers can voluntarily use ASTM cordwood, and possibly gain a market advantage
- “The EPA expressed the expectation that many manufacturers would choose the alternative cordwood compliance testing option so that consumers would have more opportunities to purchase stoves that are tuned for in-home use.” They were wrong.
- Currently, there is no formally referenced EPA test method for cordwood, but ...
- **ASTM E3053** is a “broadly applicable approved alternative test method” and the EPA will update the certificate after 5 years. All 23 cordwood certified models used this ASTM method.
- 23 models - As of June 2019, 23 models are certified with ASTM E3053 cordwood by SBI, Travis, Foyers Supreme, etc.



IDC CORDWOOD TESTING

Integrated Duty Cycle or IDC. Draft IDC test methods are being developed by NESCAUM, the northeastern state gov't air quality agency, and funded by NYSERDA – the state of NY.

- IDC built upon the knowledge of cordwood testing issues gained in the ASTM 3053-17 and European BeReal efforts.
- The goal of this test method is to increase the ability to reflect in-home performance.
- It creates a single test run that incorporates typical use patterns and incorporates variability both in the operational modes and the fuel use patterns.
- It allows for repeat tests (replicates) so testing can also assess variability of appliance performance.



The screenshot shows the NESCAUM website with a dark blue header. The header contains the NESCAUM logo and a navigation menu with links: ABOUT US, FOCUS AREAS, TOPICS, ACTIVITIES, and INITIATIVES. The main content area is titled "Test Methods" and lists three draft documents with their dates and titles. Each item has a small icon (a folder for the first two and a document for the third) and a link to the document.

NESCAUM

ABOUT US FOCUS AREAS TOPICS ACTIVITIES INITIATIVES

Test Methods

APRIL 02, 2019 WORKING DRAFT
📁 [Integrated Duty Cycle Test Method for Cordwood Stoves](#)

JANUARY 29, 2019 TEST METHOD DESCRIPTION (WORKING DRAFT)
📄 [Integrated Duty Cycle Protocol for Cordwood Boilers](#)

JANUARY 25, 2019 STANDARD OPERATION PROCEDURES DESCRIPTION (DRAFT)
📄 [NESCAUM Standard Operating Procedures for using TEOM 1405 in a dilution tunnel](#)



FUTURE OF CORDWOOD TESTING

- Probably no changes until the next NSPS which is 2023 *at the earliest*.
- **State rules.** A state, like NY or VT, could require IDC cordwood testing prior to the EPA, forcing a quicker change and increasing odds that the EPA will endorse the IDC.
- **Voluntary incentives.** States and/or federal incentive programs could favor and promote either ASTM and/or IDC cordwood certified stoves starting as soon as 2020.
- **Presidential elections.** The EPA under a democratic President may be more likely to favor the IDC over the industry backed ASTM.
- **Timetable:** theoretically, a timetable could be
 - 2025. No more crib testing. All testing after 2025 has to be with cordwood.
 - 2030. All stoves have to be tested with cordwood

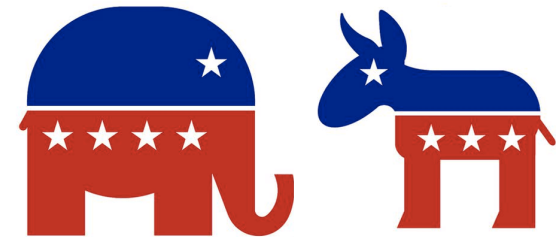
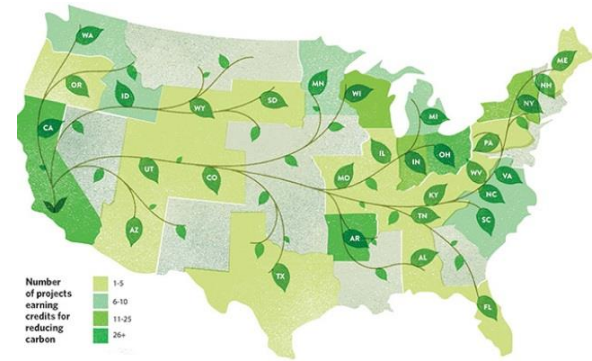


Table 8. Comparison of Key Characteristics of EPA, ASTM and IDC Test Method Approaches

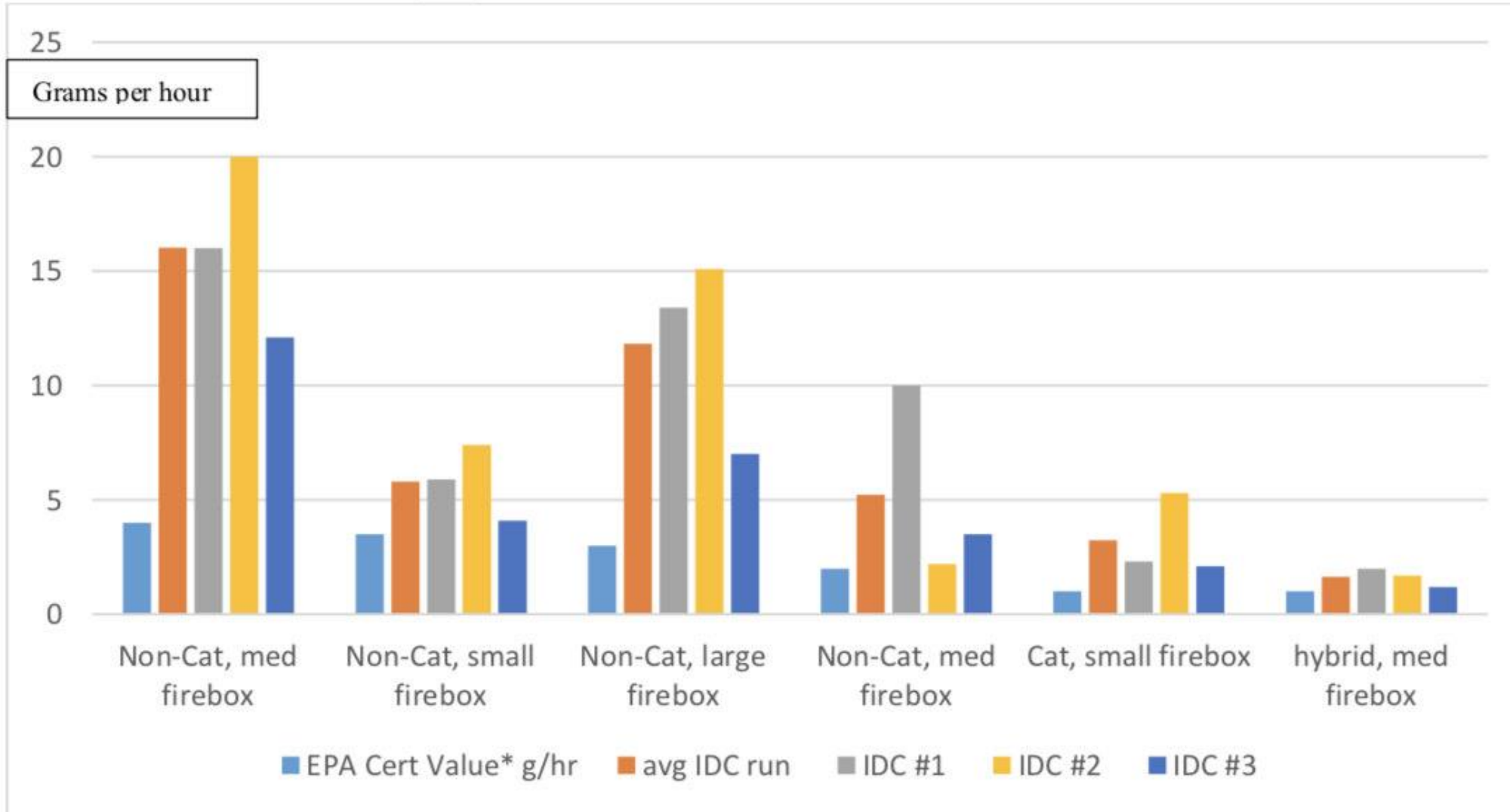
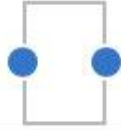
Element	M28R	ASTM 3053-17	IDC
Operational Parameters			
Number of loading events	1	1	4
Start-up	No	Yes, combined with high fire	Yes, separate phase
High fire	Yes	Yes, combined with start up	Yes
Maintenance – semi-active attended burn	No	No	Yes
Overnight burn	Yes	Yes	Yes
Replicates	None	None	3
Long charcoal tails	Yes	Yes	No
Protocol supported by user data	No	No	Yes
Precision and variability data	No	No	Yes
Fueling Parameters			
# of different load sizes by weight	1	2	4
# different piece configurations	1	1	4
# of allowed fuel species allowed	1	Unlimited based on density	2
Impact of species data	No	No	Yes
PM Measurement			
Real-time PM Measures	No	No	Yes
Changes in filter measurements to Increase method precision	No	No	Yes



**Excerpted from
NECSAUM ANPR
comment to EPA,
2/12/2019**



Figure 1. Comparison of EPA Certification Values with “In-use” Protocol




Excerpted from
NECSAUM ANPR
comment to EPA,
2/12/2019

**Certification values are rounded to the nearest 0.5 gram.*



CANADIAN REGULATIONS

 CODES & STANDARDS SUMMARY	WOOD BURNING FIREPLACE REGULATIONS		
	Compliance with CSA B415 - Performance testing of solid-fuel-burning heating appliances		Compliance with EPA New Source Performance Standards 40 CFR Part 60
British Columbia	YES	OR	YES
Alberta	YES	OR	YES
Saskatchewan	YES Enforcement Jan 1, 2019	OR	YES Enforcement Jan 1, 2019
Manitoba	YES	OR	YES
Ontario	YES	OR	YES 2013 Version
Quebec**	YES	OR	YES
Nova Scotia	YES	OR	YES
New Brunswick***	NO		NO
Prince Edward Island****	NO		NO
Newfoundland & Labrador	YES	OR	YES
Nunavut	NO		NO
Northwest Territories	NO		NO
Yukon	YES	OR	YES

Canada has a total of 35 million people. Of that, more than 60% lives in 2 provinces – Ontario & Quebec. Provinces that do not follow the US EPA's emission standards have less than 3% of the population.

The US has 309 million people and California has 40 million, more than all of Canada.

Canada on the other hand, has cold temperatures, a government led by rationale people and some carbon taxing.



THANK YOU

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ALLIANCE
FOR GREEN HEAT
low carbon, renewable and local



NEXT GENERATION
Woodstove
DesignChallenge

