Woodstove Changeout Programs

John Crouch
Director of Public Affairs
Hearth, Patio & Barbeque Association

September 27, 2016
Fairbanks, Ak

wood stove CHANGEOUT

HPBA Hearth, Patio & Barbecue Association

Goal for Today

- Changeouts – understand the
  - Strengths
  - Limitations

- EPA Certified Woodstoves –
  - Strengths
  - Limitations

wood stove CHANGEOUT

HPBA Hearth, Patio & Barbecue Association

WHY changeouts?

- Heat
- Most stoves pre-date 1988 rule
- Old stoves don’t wear out
- Incentivizes consumers to act
  - Brings emission reductions forward
  - Similar to Diesel changeout programs
- Opportunity for education
- No cookbook, each program unique

wood stove CHANGEOUT

HPBA Hearth, Patio & Barbecue Association

Changeout Fundamentals

Fundamentals of Wood Stove changeouts: (HPBA version)

1. Fuel neutral: wood, pellet, or gas – *anything* is better!
2. No fuel bias: let the consumer decide
3. Careful installation: NFI
4. Education benefit: leverage

- 5. Old stove **must** be destroyed:
- 6. Government incentives critical to "harvest the old stove"

wood stove CHANGEOUT

HPBA Hearth, Patio & Barbecue Association

History of Changeouts

- 1989, Medford, Oregon – 10%
- 1990-91, Seattle, WA
- 2000-2001, Great Lakes
- 2005, Pittsburg & Libby,
- 2010 - 1st settlement changeout
- Since then 17 major settlements
- Targeted Airshed Grants

wood stove CHANGEOUT

HPBA Hearth, Patio & Barbecue Association

Other Changeouts

- Washington State – every 2 years,
- Oregon, stimulus funds,
- California, local funds, very different programs in different areas,
- San Joaquin Valley –Serious NAA,
- Powertrain – Mobil Source
- Harley Davidson - $3 Million
- California Cap and Trade

wood stove CHANGEOUT

HPBA Hearth, Patio & Barbecue Association

Typical aspects of all changeouts

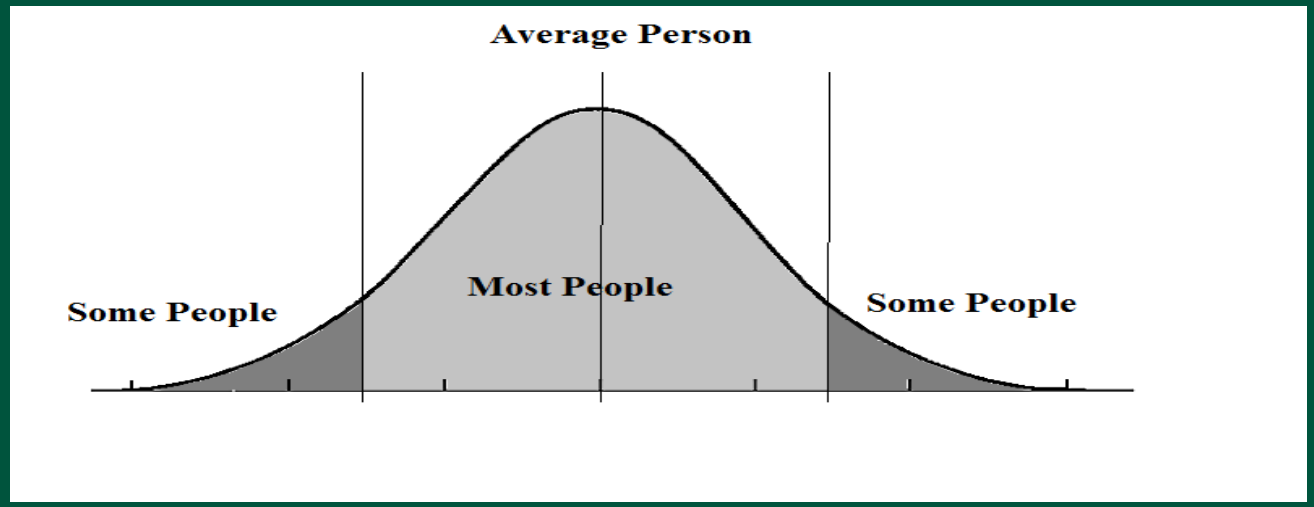
- Old woodstove is surrendered
  and Destroyed.
- Replacement may be anything cleaner: EPA-certified woodstove, pellet stove, gas hearth product, electric or oil heater
- Programs have 2 categories:
  - General
  - Low income

wood stove CHANGEOUT

HPBA Hearth, Patio & Barbecue Association

Changeout Issues

- Tension between replacing the most stoves, and decreasing smoke
- Where to set the incentive levels?



wood stove CHANGEOUT

HPBA Hearth, Patio & Barbecue Association

2 Whole Town Changeouts

- Crested Butte - 1989-1990
- Libby, Mt - 2005 – 2007
- Both collaborative efforts -- Government & Industry,
- Neither had natural gas and wood heat was common in most homes
- Both communities had back-stop regulation
- Both already had some cert. stoves

wood stove CHANGEOUT

HPBA Hearth, Patio & Barbecue Association

Crested Butte 1989-1990

- Voluntary Program,
- Change by date certain, OR,
  - Pay $30/month polluters fee – 3 years,
- New homes, more insulation, 1 stove
- Real Estate Changeout
- City inspected every home & installation, industry brought discounts on few models.
- 11,500 DD, Softwood Pine only

wood stove CHANGEOUT

HPBA Hearth, Patio & Barbecue Association

Crested Butte Results

- 516 Solid fuel appliances,
- 81 already certified,
- (29 exempt elderly coal burners)
- After changeout –
  - 195 replaced to certified stove
  - 135 removed
  - 76 no action
- Before/After results – 59% improved

wood stove CHANGEOUT

HPBA Hearth, Patio & Barbecue Association

Libby, Mt Changeout 2005-07

- Annual non-attainment
- No Nat Gas
- Asbestosis
- App 1800 stoves, 1/3 cert
  - (real estate transfer rule)
- Target = 1200 Homes
  - 900 ‘middle’, 300 ‘low’
- 7200 DD
- Fuel, Larch, Fir, Pine

wood stove CHANGEOUT

HPBA Hearth, Patio & Barbecue Association

Libby Vouchers

- Low income – complete woodstove, chimney, and hearth pad,
- Middle income,
  - $700 for any heater,
  - $200 for professional installation
  - $1400 for wood furnace
  - $100 for early birds, 1st 250
  - $350 for cat replacement/stove repair
- Our Big “Miss”
  - Should have had chimney voucher

wood stove CHANGEOUT

HPBA Hearth, Patio & Barbecue Association

Box Score

• Pellet Insert/Stove	121
• Pellet Furnace	46
• Gas Stove/Heater	50
• Oil Stove/Furnace	19
• Electric Heat Pump	14
• Wood Furnace	11
• Wood Stove/Insert	510
• Surrendered Old Stove	9
• Stoves Rebuilt/Cats	79

wood stove CHANGEOUT

HPBA Hearth, Patio & Barbecue Association

Backstop

- Both City of Libby, & Lincoln county adopted ordinances that made it illegal to continue to use an uncertified stove, unless registered and issuesd a sole source exemption.
- Tough vote, but essential to move holdouts to act.
- Easier in light of changeout.

wood stove CHANGEOUT

HPBA Hearth, Patio & Barbecue Association

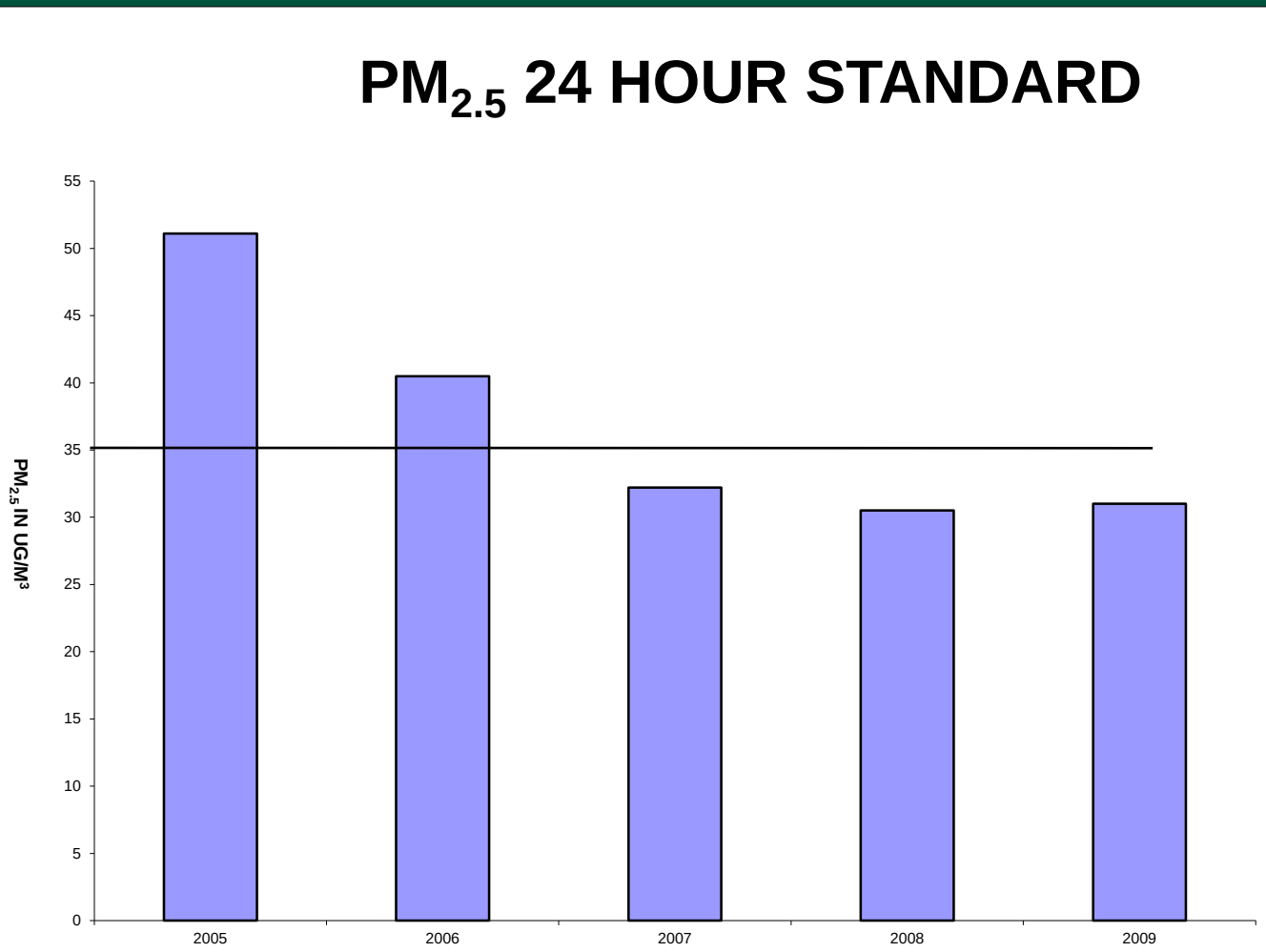
Cost

- 10 years ago,
- ~ 1200 stoves,
  - ~1,000,000 from industry,
  - ~1,100,000 from EPA “earmark”
  - ~1,000,000+ local residents
- No Hydronic Heaters,
- Most changeouts now use,
  - $3500 - $4,000 for total costs
    - (lower 48 costs)

wood stove CHANGEOUT

HPBA Hearth, Patio & Barbecue Association

Lower PM 2.5



wood stove CHANGEOUT

HPBA Hearth, Patio & Barbecue Association

INDOOR AIR QUALITY

- 20 homes - U of Montana study of indoor air quality
- Indoor $PM_{2.5}$ levels measured for 24 hour periods pre- & post-changeout
- Homeowners kept logs during the testing for unusual events
- Average reduction in indoor $PM_{2.5}$ levels to be approximately 72%

wood stove CHANGEOUT

HPBA Hearth, Patio & Barbecue Association

Harvest Time

Lesson's learned from Libby

- Hidden wood heat
- Communication challenges
  - "Really, a free stove?"
  - Just getting by families
- Wood vs. more expensive options
- Rental & landlords were tricky
- Limited number of good installers
- Fixed many potential fire hazards
- Dedicated "Champion" was key

wood stove CHANGEOUT

HPBA Hearth, Patio & Barbecue Association

Operators – Not Numbers

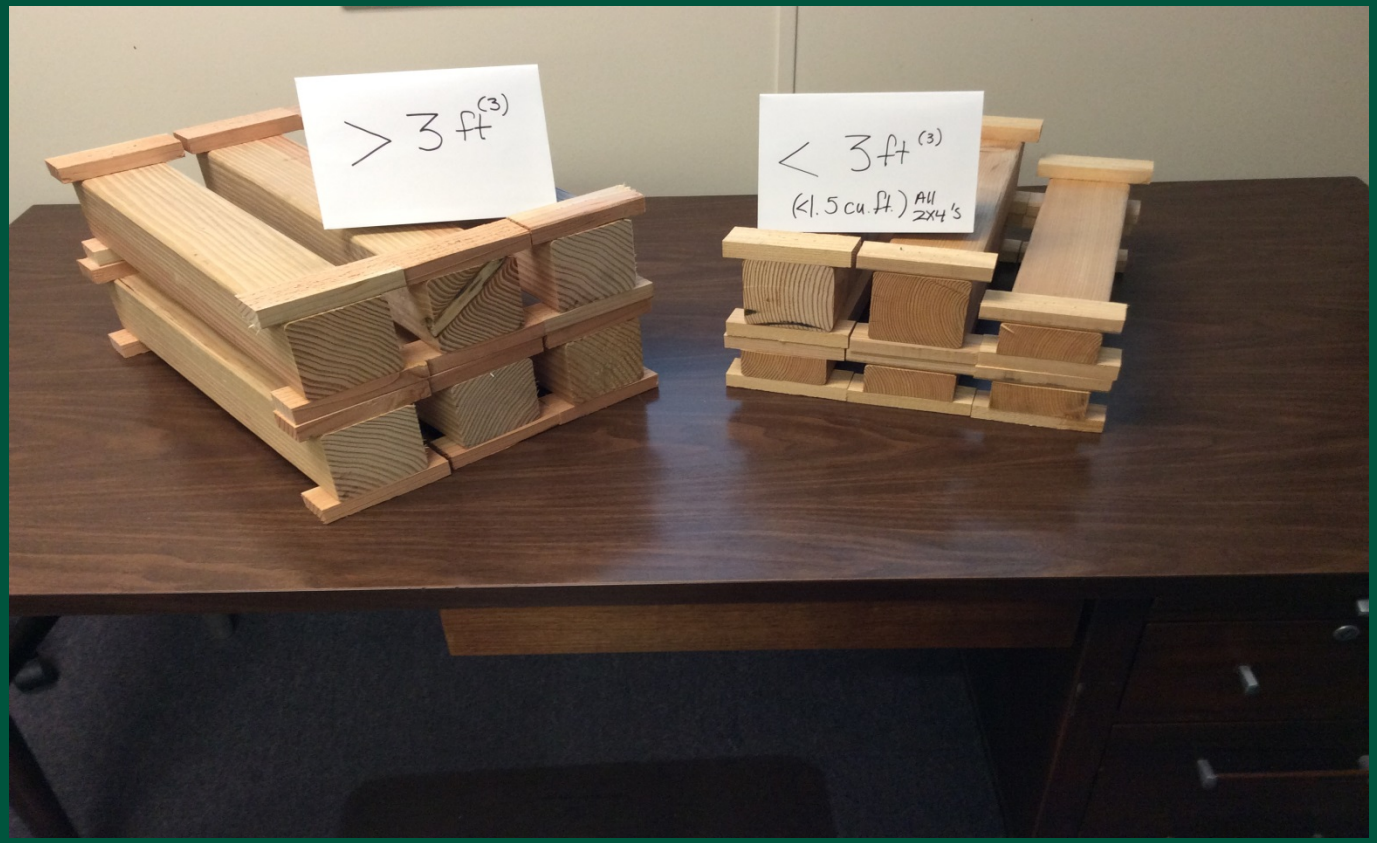
- Stove Fair
- Burn Smart Fair
- Local Coordinator followed up & intervened to re-teach
- Hammered away at moisture
- Emphasized tall Chimneys
- Did Not – worry about stoves g/h

wood stove CHANGEOUT

HPBA Hearth, Patio & Barbecue Association

EPA test Method – 30 years old

- Based on Douglas Fir Lumber



wood stove CHANGEOUT

HPBA Hearth, Patio & Barbecue Association

Lab Conditions

- Smoke diluted by ‘ambient air’
  - From Laboratory ~ 70 degrees
- Single story stack
- Light load, 7 lb/ cu ft
- 4 burns, averaged, low to high
- More surface area than cordwood
- Lower the passing grade, the closer it is tuned

wood stove CHANGEOUT

HPBA Hearth, Patio & Barbecue Association

Numbers only go so far

- Not that grams/hour have no value,
  - 3.5 g/h stove is certainly cleaner that 7.4 g/h stove.
  - Variability in method 2-3 g/h
- Method provides guide to:
  - “Good, Better, Best”
- Operator makes big difference

wood stove CHANGEOUT

HPBA Hearth, Patio & Barbecue Association

We're Stuck with this Test

- Areas that understand limitations of method can mitigate them
- Good chimneys err on taller side
- Wood moisture – obvious
- Piece size - smaller is better
- Details in new EPA rule such that industry must use cribs
- Someday, a real world cordwood method – but it won't be 2.5 g/h

wood stove CHANGEOUT

HPBA Hearth, Patio & Barbecue Association

Summary

- Changeouts can work,
  - Change appliances, and help change wood burning culture
  - Not a panacea
- Grams per hour are indicator, but only that
  - Laboratory numbers only
  - Operators are the real key

wood stove CHANGEOUT

HPBA Hearth, Patio & Barbecue Association