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National Residential Wood Combustion Survey Results

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Residential Wood Combustion in the NEI

- Residential Wood Combustion (RWC) is a significant source of air pollution
 - Approx. 6% of all primary particulate matter =< 2.5 microns in diameter ($PM_{2.5}$) emissions in 2014
- Emissions estimation method uses survey data to estimate:
 - Fraction of homes in each county that use wood-burning appliances
 - Average amount of wood burned in each appliance
- 2014 NEI used data from Energy Information Administration's Residential Energy Consumption Survey



2017 National Survey



- 2017 NEI will use data from a national survey supported by the Commission for Environmental Cooperation (CEC) and Northeast States for Coordinated Air Use Management (NESCAUM)
- Surveyed 21 states throughout the U.S.
- Mailed letters and follow-up post cards; survey conducted by web
- Stratified: more surveys sent to areas likely to burn wood

State	# of Responses	# of Surveys Sent	Response Rate (%)
AR	68	2,992	2.27
CO	90	2,625	3.43
CT	140	4,310	3.25
GA	91	4,976	1.83
ID	42	1,737	2.42
LA	33	2,113	1.56
ME	223	5,184	4.30
MA	215	6,781	3.17
MI	237	7,418	3.19
MO	113	5,083	2.22
NH	150	3,529	4.25
NJ	46	2,216	2.08
NY	240	7,738	3.10
NC	183	7,011	2.61
OH	170	7,117	2.39
PA	301	8,640	3.48
RI	34	1,118	3.04
UT	37	1,007	3.67
VT	126	2,538	4.96
WA	181	5,006	3.62
WI	264	5,363	4.92
TOTAL	2,984	94,502	3.16

2017 National Survey

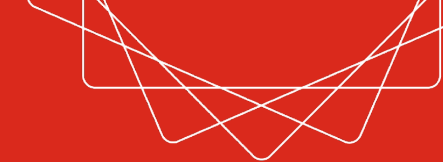


- Survey asked:
 - Whether respondent used a particular type of wood-burning appliance
 - How much wood they burn (cordwood, pellets, or wax logs)
 - When and how often they burn
 - Age and model number of appliance
 - Demographic data

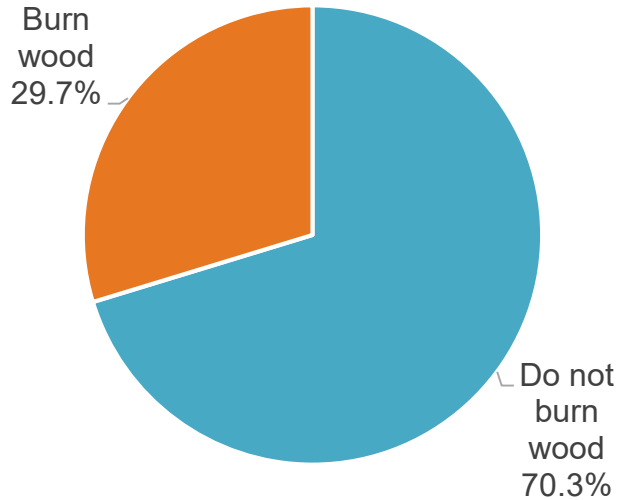
Appliances included:

- Conventional Fireplaces
- Fireplace inserts
- Woodstoves
- Wood-fired furnaces
- Wood-fired boilers
- Pellet stoves
- Outdoor recreational equipment (e.g. fire pits)

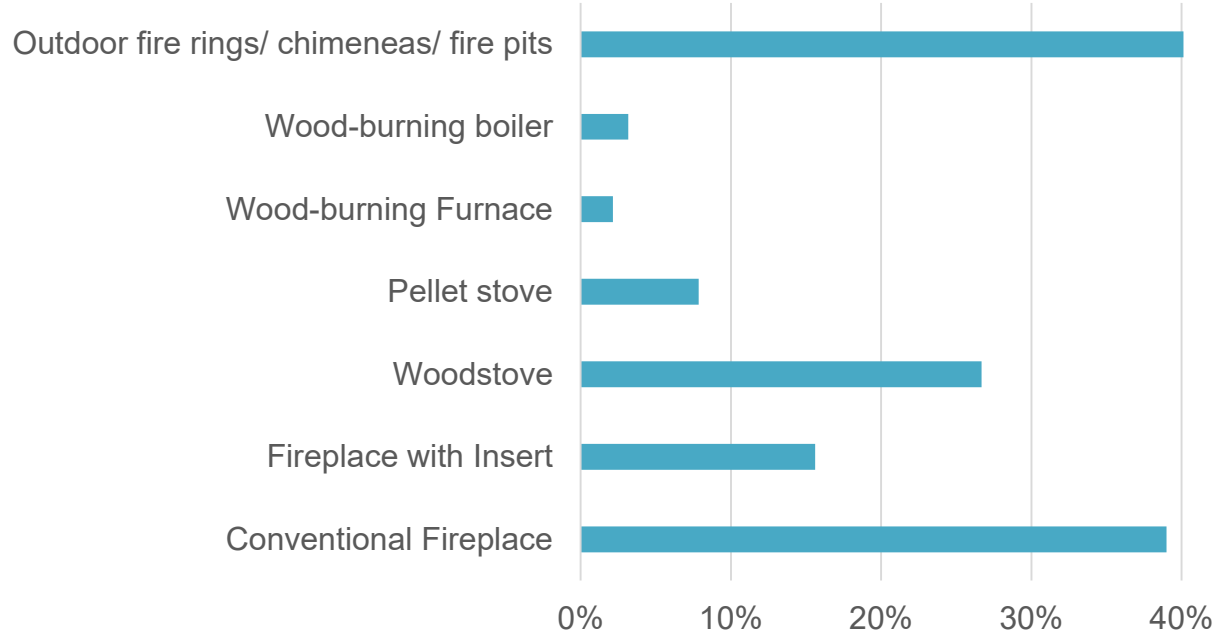
Survey Results - Summary



Percentage of wood-burning households that use each appliance



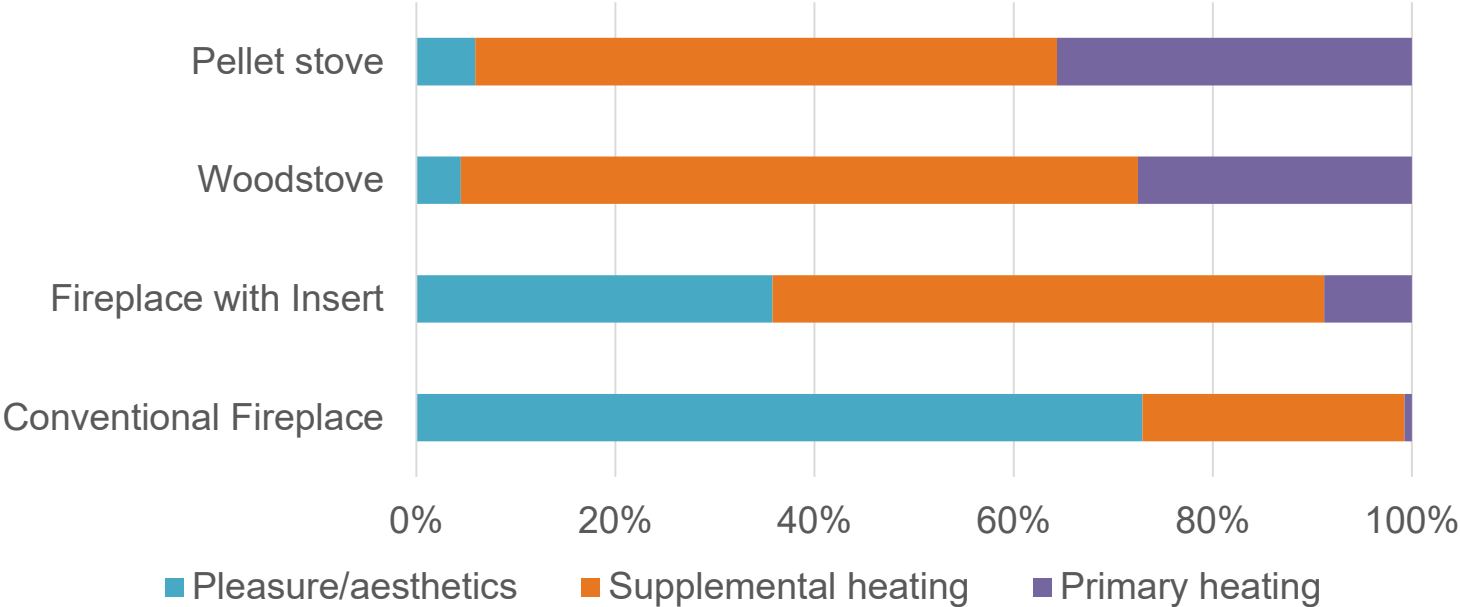
Percentage of households that burn wood



Survey Results – Primary Use



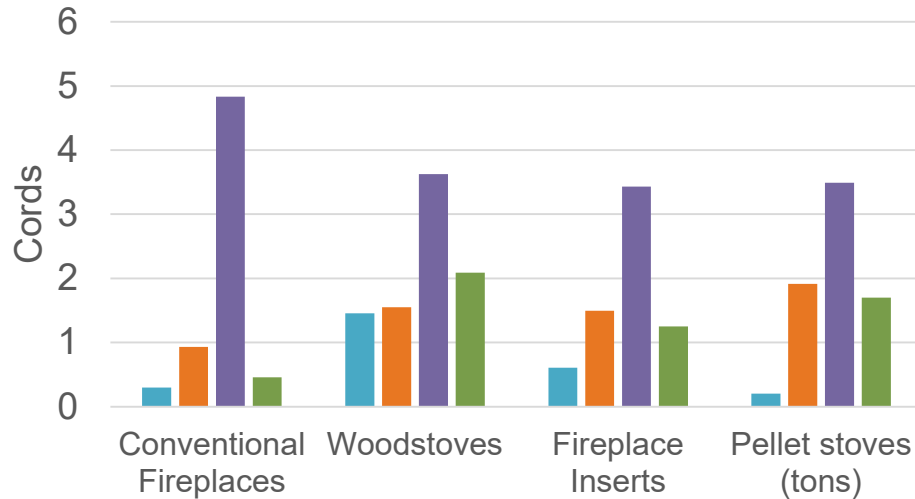
Primary use of wood-burning appliances



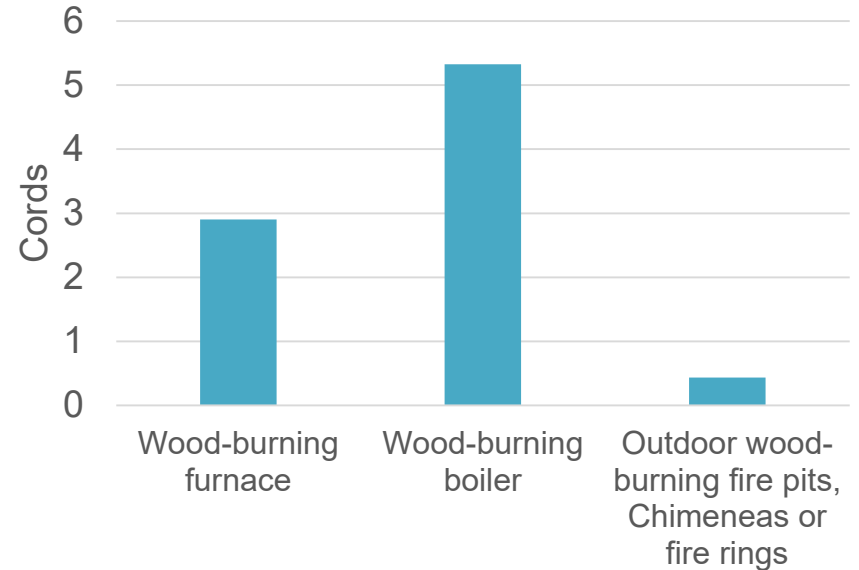
Survey Results – Cords Burned



Average Cords Burned Per Appliance

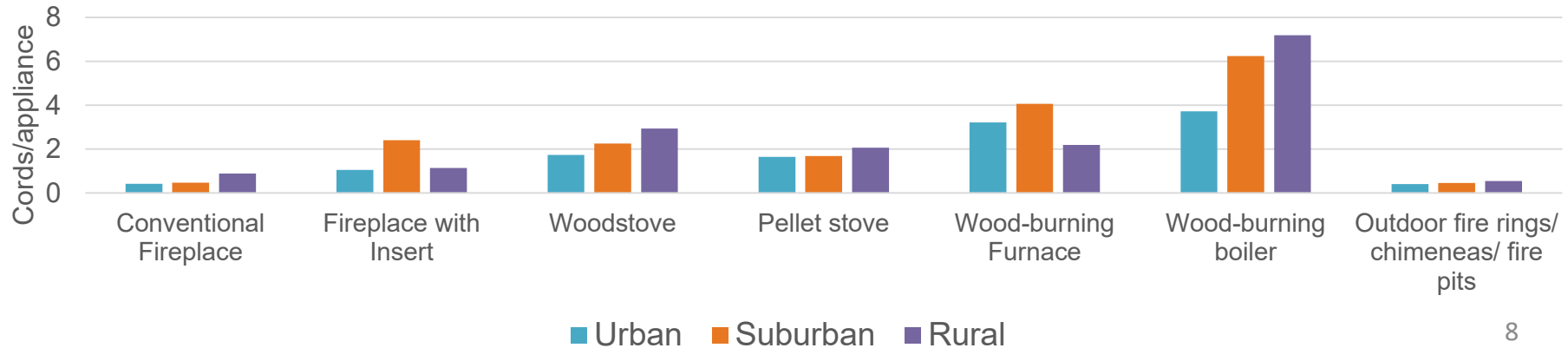
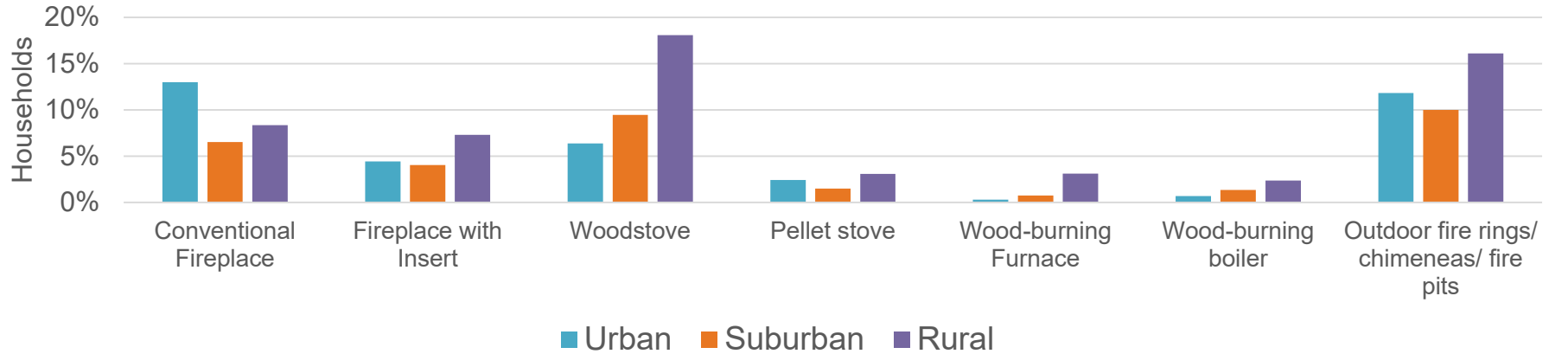


- Pleasure/ aesthetics
- Back-up, room heating or supplemental heating
- Primary source of heat
- Weighted Average

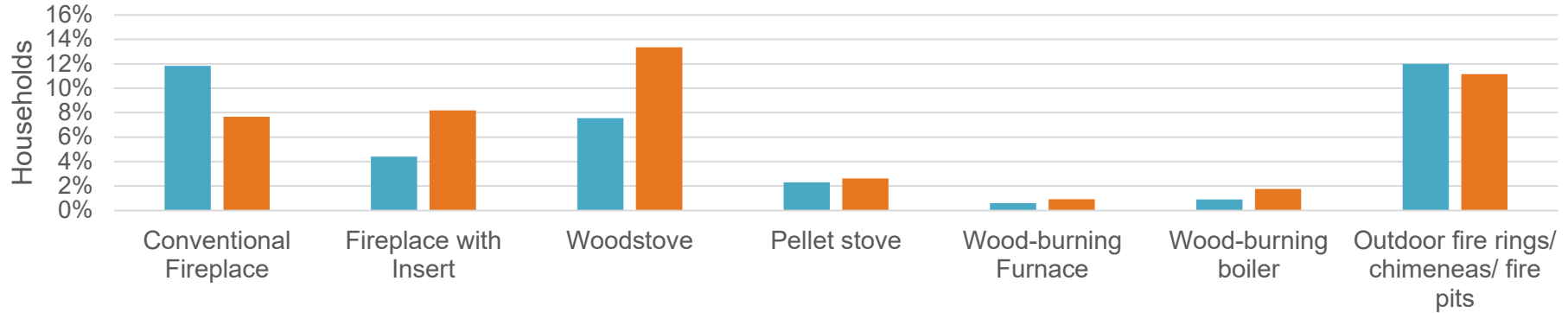


- Weighted Average

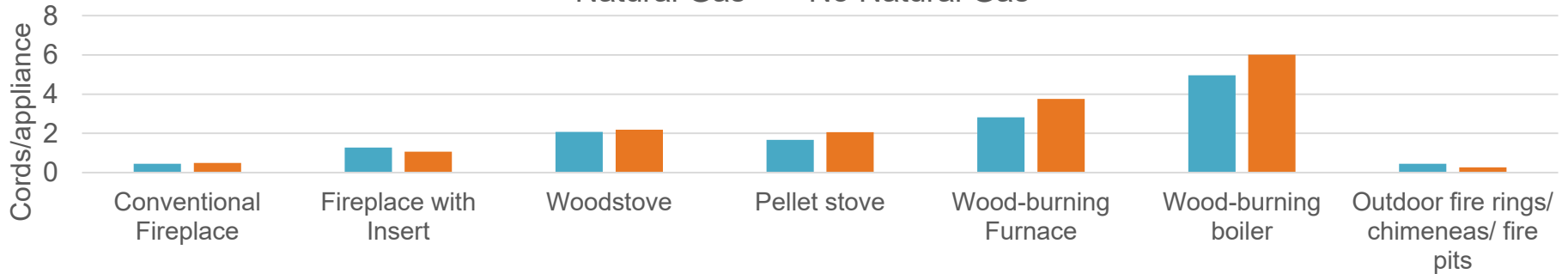
Appliance Fractions and Burn Rates by County Type



Survey Results – Natural Gas Access



■ Natural Gas ■ No Natural Gas



■ Natural Gas ■ No Natural Gas

Survey Results – Type of Dwelling

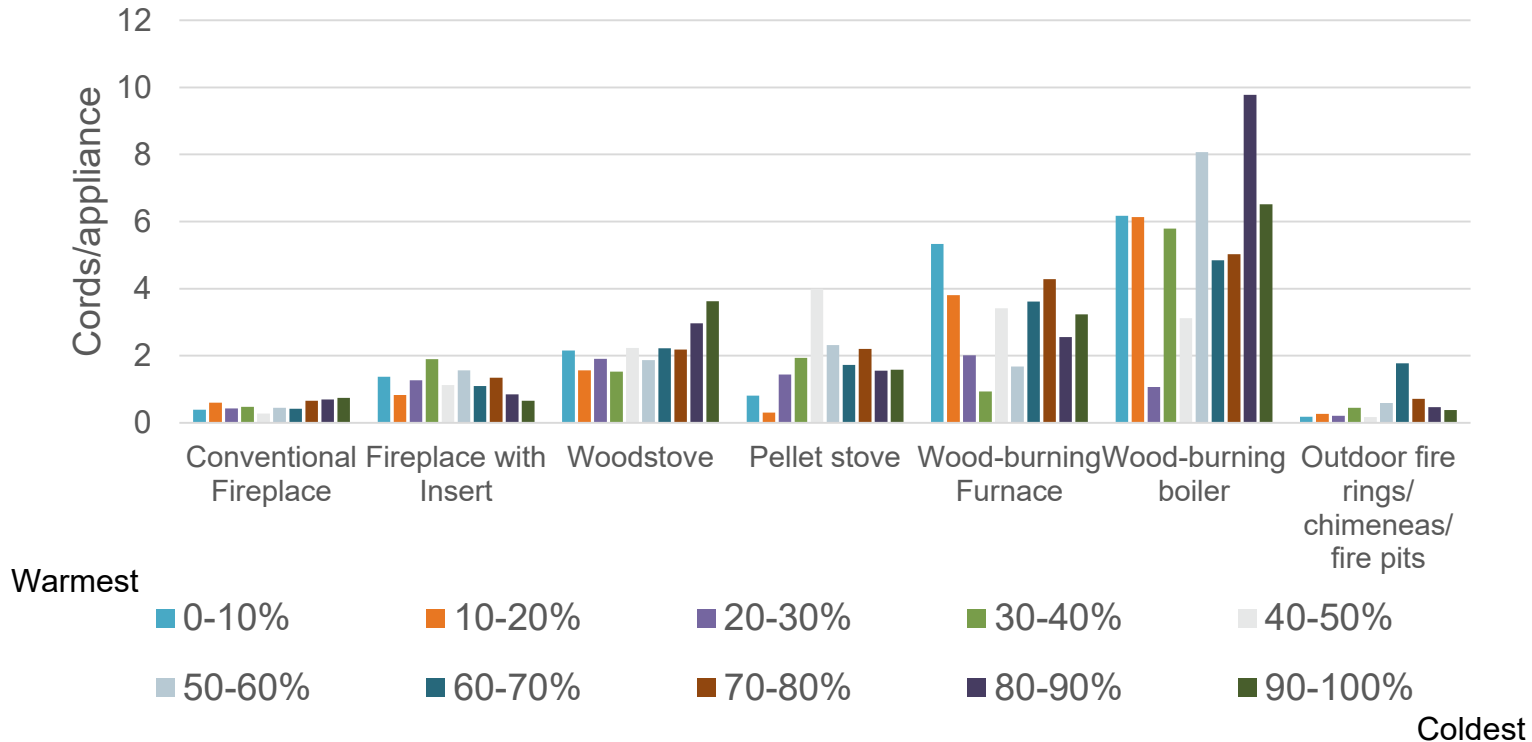


Percent of Households Using Each Appliance by Type of Dwelling



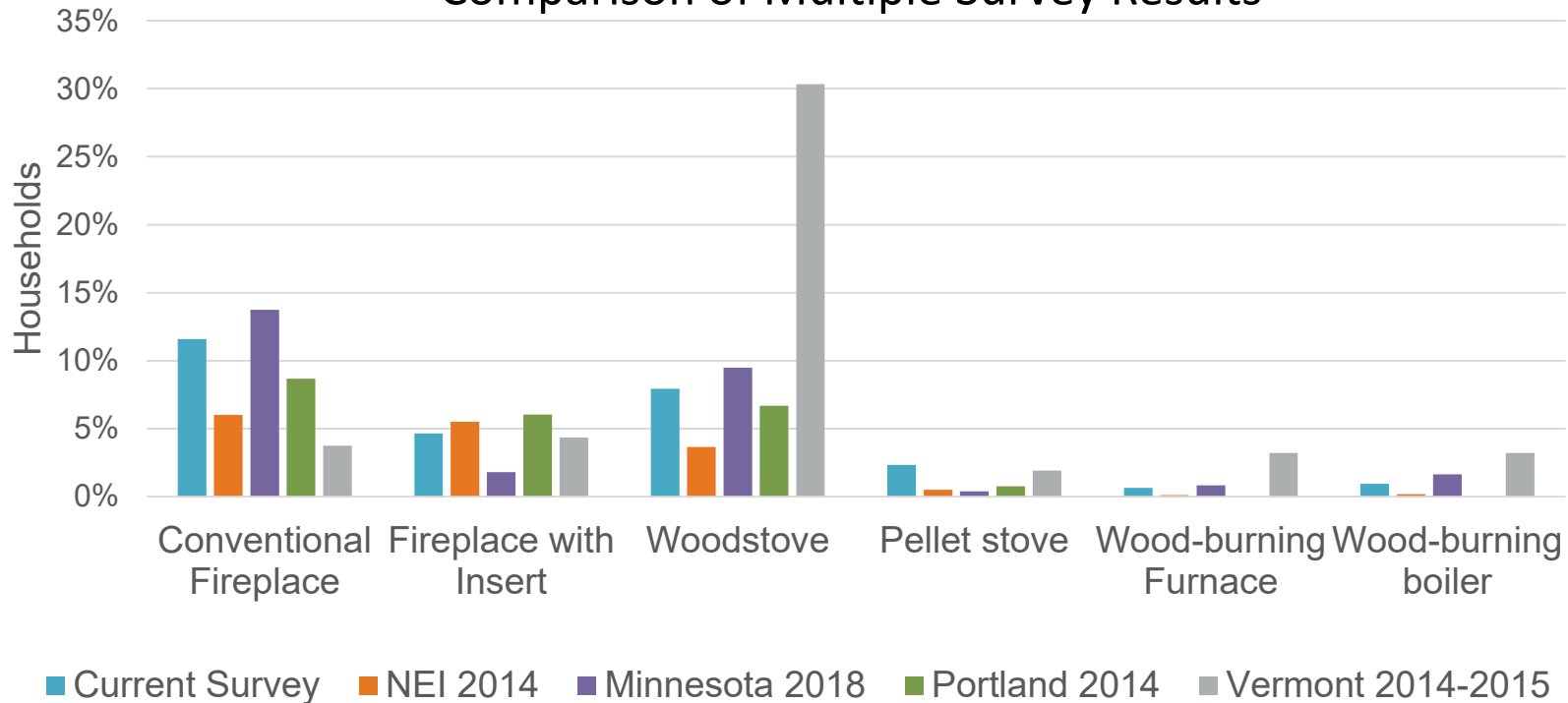
Survey Results – Heating Degree Days

Average Cords Burned Per Year by Heating Degree Day Bins



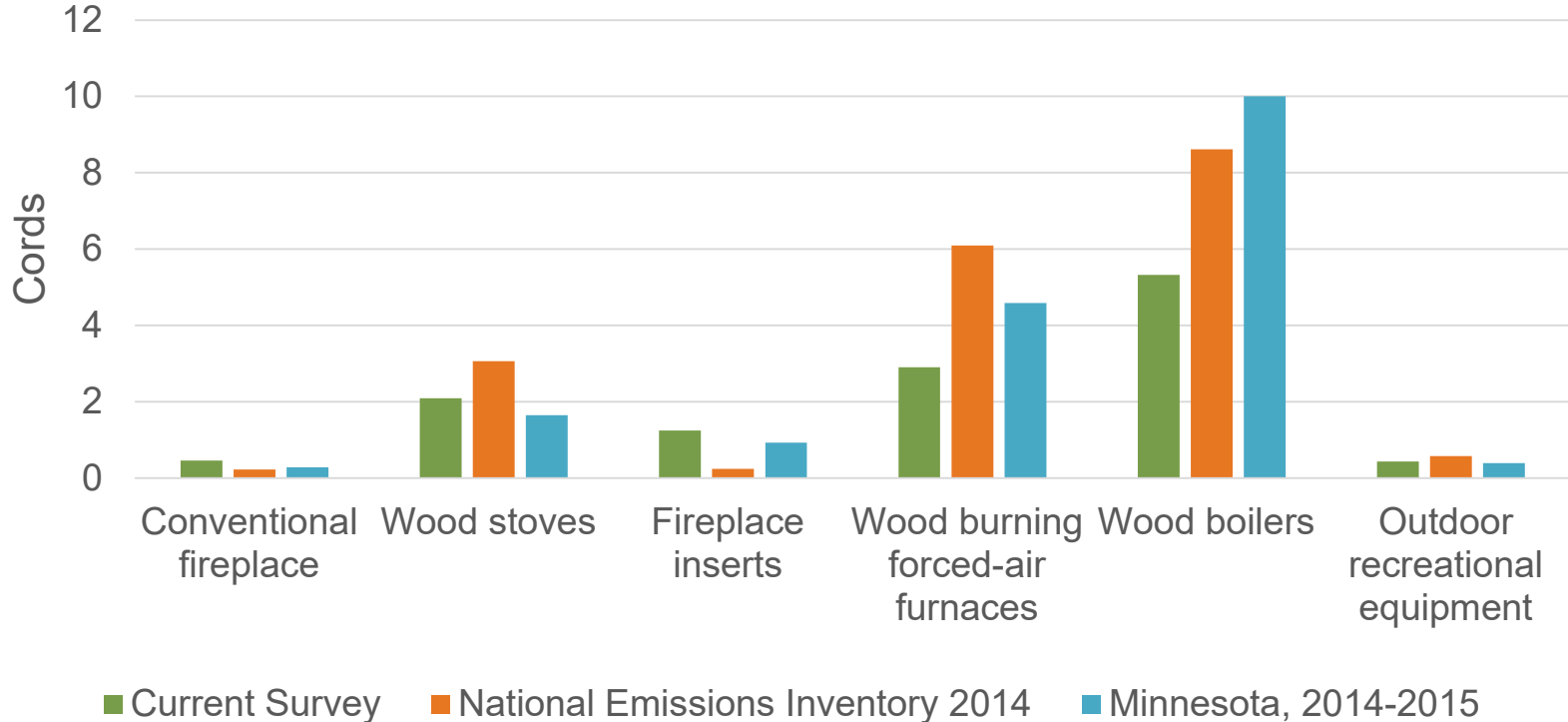
Survey Results – Comparison to Other Surveys

Percentage of Households Using Each Appliance Type: Comparison of Multiple Survey Results

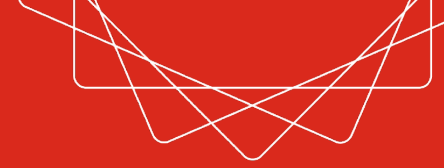


Survey Results – Comparison to Other Surveys

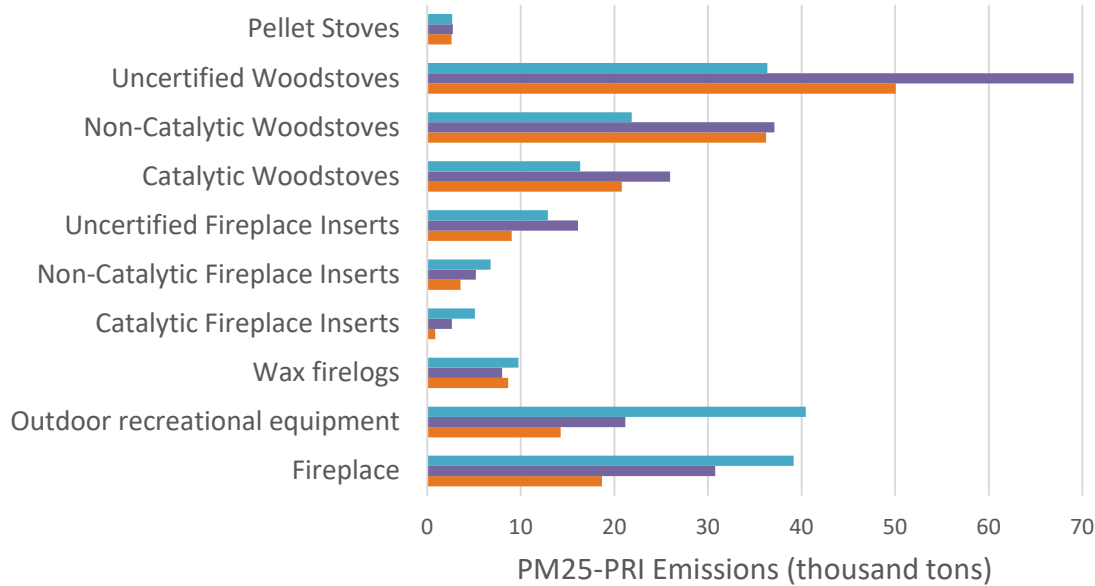
Average Cords Burned per Appliance Type: Comparison of Multiple Survey Results



Comparing RWC NEI Emissions

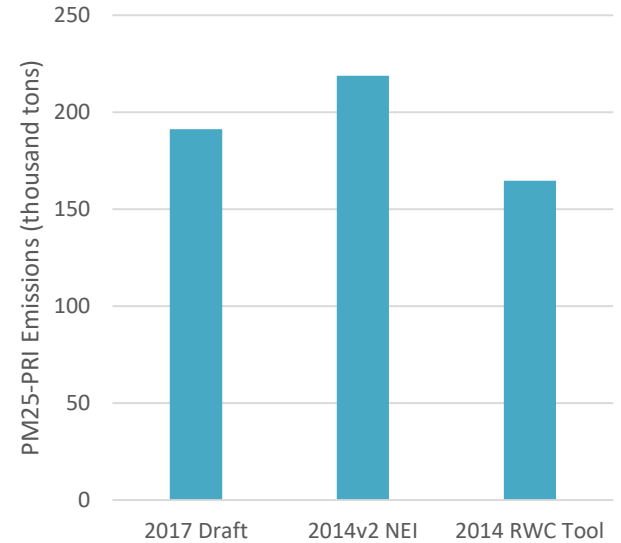


By Appliance



■ 2017 Draft ■ 2014v2 NEI ■ 2014 RWC Tool

Total



Summary



- The survey represents the most comprehensive national assessment of wood-burning activity in the United States to date
- The most common wood-burning appliances—fireplaces and outdoor recreational equipment—have the lowest burn rates
- There are notable differences in urban, suburban, and rural burning, with wood-burning activity generally being more common in rural areas and areas with little natural gas access
- Results compared reasonably well to other state and local surveys

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