



*Session 2: Ventilation & Baseloads*

May 5, 2015

**Ben Tucker & Jake McAlpine**

Minnesota Department of Commerce

Division of Energy Resources

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# Mechanical Ventilation

- Why do we ventilate?
  - DOE requires ASHRAE 62.2 on all dwellings weatherized.
  - **Durability**
    - “Built tight, ventilate right”
    - Moisture balance
  - **Health & Safety**
    - CO removal
    - Humidity reduction (mold, dust mites)
  - **Natural vs Mechanical Ventilation**
    - Seasonal changes in ventilation
    - Consistency of mechanical ventilation

# Mechanical Ventilation

- Ventilation is made up of 4 sections
  - Exhaust
  - Supply
  - Whole Building Ventilation
  - Additional Resources

# Mechanical Ventilation

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## Standard Work Specifications Tool

Search All Topics  [Go](#)

[Health & Safety](#) | [Air Sealing](#) | [Insulation](#) | [Heating & Cooling](#) | **[Ventilation](#)** | [Baseload](#)

<b>EXHAUST</b>	<del><b>SUPPLY</b></del>	<b>WHOLE BUILDING VENTILATION</b>	<b>ADDITIONAL RESOURCES</b>
<a href="#">Components</a>	<del><a href="#">Components</a></del>	<a href="#">Air Flow Requirements</a>	<a href="#">Codes &amp; Standards Resources</a>
<a href="#">Fans</a>	<del><a href="#">Fans</a></del>	<a href="#">Components</a>	
<a href="#">Exhaust Ventilation Systems</a>	<del><a href="#">Supply Ventilation Systems</a></del>	<a href="#">Dehumidifiers</a>	
<a href="#">Appliance Exhaust Vents</a>	<del><a href="#">Special Considerations</a></del>	<a href="#">Equipment Evaluation</a>	
<a href="#">Special Considerations</a>		<a href="#">Exhaust-Only System</a>	
		<a href="#">Equipment Removal</a>	
		<a href="#">Passive Ventilation</a>	
		<a href="#">Special Considerations</a>	

# Mechanical Ventilation

- ⊕ 1. Using the Standard Work Specifications
- ⊕ 2. Health & Safety
- ⊕ 3. Air Sealing
- ⊕ 4. Insulation
- ⊕ 5. Heating & Cooling
- ⊖ 6. Ventilation
  - ⊕ 6.60: Exhaust
  - ⊕ 6.61: Supply
  - ⊕ 6.62: Whole Building Ventilation
  - ⊖ 6.99: Additional Resources
    - [Codes & Standards Resources](#)
- ⊕ 7. Baseload

## 6.9901.1 Supplemental Ventilation Information—ASHRAE 62.2

**Topic:** Additional Resources

☆ Favorite

**Subtopic:** Codes and Standards Resources

**Desired Outcome:** To provide supplemental ventilation information—ASHRAE 62.2

For supporting material, see [Calculation of the Infiltration Credit](#) and [Referenced Standards](#).

Single-Family Homes		Manufactured Housing	
TITLE	SPECIFICATION(S)	OBJECTIVE(S)	
<input type="checkbox"/> 6.9901.1a Ventilation fan flow rate	<a href="#">ASHRAE</a> Standard 62.2-2013 and the calculation of the <a href="#">infiltration</a> credit allow adjustments to primary ventilation fan flow rates for existing houses using a single fan.	To provide supplemental ventilation information-- <a href="#">ASHRAE</a> 62.2	

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<a href="#">Special Considerations</a>		<a href="#">Exhaust-Only System</a>	
		<a href="#">Equipment Removal</a>	
		<a href="#">Passive Ventilation</a>	
		<a href="#">Special Considerations</a>	

# Mechanical Ventilation

The screenshot shows the NREL Standard Work Specifications tool interface. At the top right, there are navigation links: Home, About, Help, My Account, and Sign In. Below the NREL logo is a search bar labeled "Search All Topics". A horizontal navigation bar contains tabs for "Mechanical Ventilation", "Sealing & Insulation", "Equipment", "Lighting & Controls", "Ventilation", and "Energy". The "Ventilation" tab is currently selected. Below the navigation bar, the content is organized into four columns: EXHAUST, SUPPLY, WHOLE-BUILDING VENTILATION, and ADDITIONAL RESOURCES. The EXHAUST column lists Components, Fans, Exhaust Ventilation Systems, Appliance Exhaust Vents, and Special Considerations. The SUPPLY column lists Components, Fans, Supply Ventilation Systems, and Special Considerations. The WHOLE-BUILDING VENTILATION column lists Components, Dehumidifiers, Equipment Evaluation, Exhaust-Only System, Equipment Removal, Passive Ventilation, and Special Considerations. The ADDITIONAL RESOURCES column lists Codes & Standards Resources.

**Exercise: How to install an SWS compliant dryer vent**

# Mechanical Ventilation

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- EXHAUST**
  - Components
  - Fans
  - Exhaust Vents
  - Appliance Exhaust Vents
  - Special Considerations
- SUPPLY**
  - Components
  - Fans
  - Special Considerations
- WHOLE-BUILDING VENTILATION**
  - Components
  - Demand/Controllers
  - Equipment Evaluation
  - Exhaust-Only System
  - Equipment Removal
  - Passive Ventilation
  - Special Considerations
- ADDITIONAL RESOURCES**
  - Codes & Standards Resources

Overlaid on the grid is the text: "Exercise: How to install an SWS compliant bath fan with continuous function to meet ASHRAE 62.2-2013".

# Standard Work Specifications

## Minnesota WAP Weatherization Field Guide SWS-Aligned Edition

Primary author: John Krigger

Illustrators: John Krigger, Bob Starkey,  
Steve Hogan, Wayne Harney, Darrel Tenter

Technical publisher: Darrel Tenter

Editors: Darrel Tenter, Timmie Smart, and Mary Coster

*The Minnesota Weatherization Field Guide*  
describes procedures used to analyze and improve the  
performance of existing homes retrofitted under the  
Department of Energy's Weatherization Assistance Program. This  
field guide is cross referenced to DOE's Standard Work Specifications  
for Home Energy Upgrades.

The author recognizes the knowledge, ingenuity, and creativity of the  
weatherization network throughout the United States for pioneering,  
changing, and perfecting the standards, specifications and  
procedures documented in this field guide.

Customers Reviewers, Project Manager and other participants

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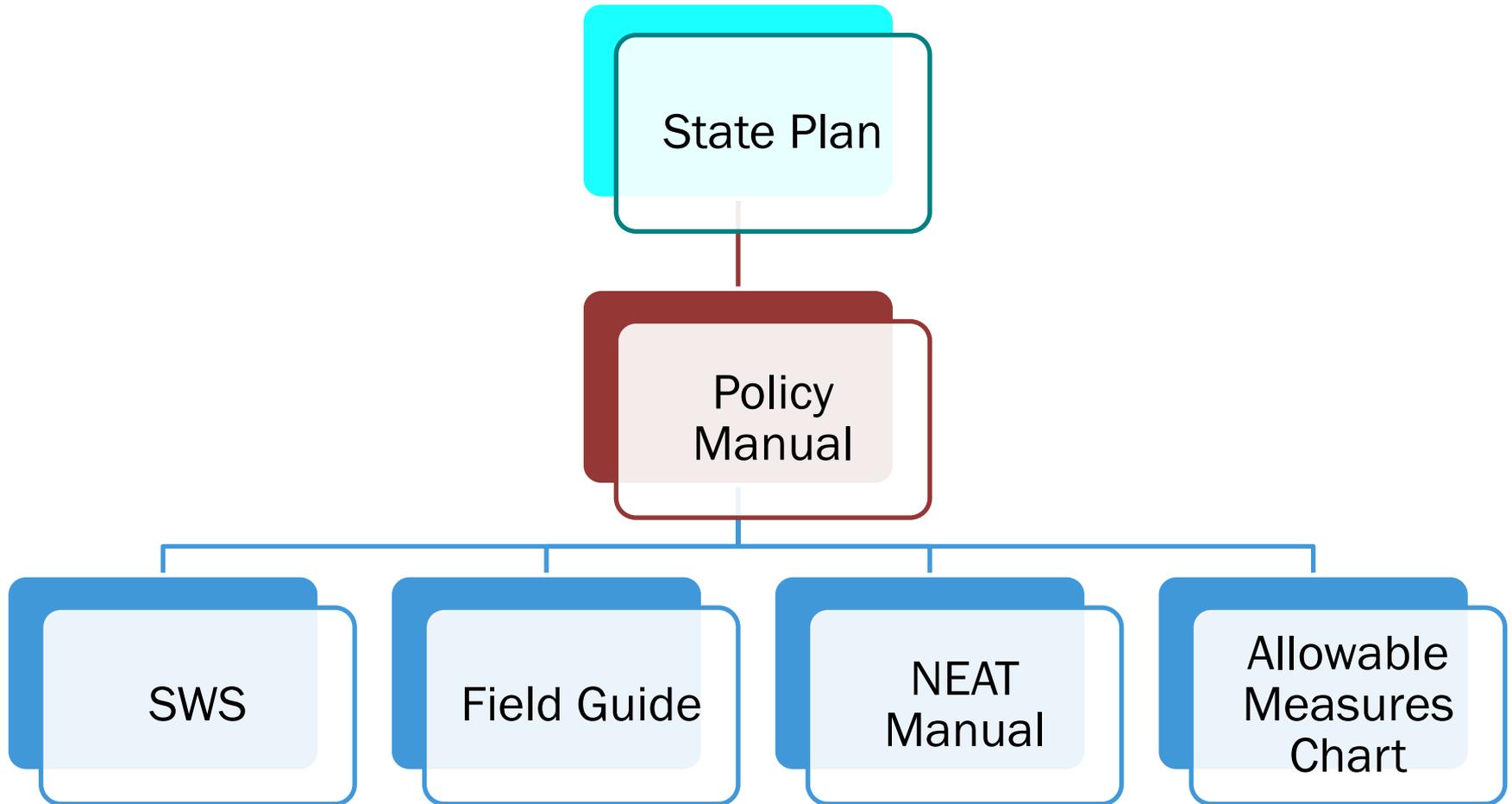
# Standard Work Specifications

SWS For Single Family Homes	SWS Field Guide
1. Using the Standard Work Specifications	Not Explicitly in Field Guide
2. Health and Safety	1. Health and Safety
3. Air Sealing	3. Weatherization Materials, 4. Attics and Roofs, 5. Walls, 6. Floors and Foundations, 7. Windows and Doors
4. Insulation	3. Weatherization Materials, 4. Attics and Roofs, 5. Walls, 6. Floors and Foundations, 7. Windows and Doors
5. Heating and Cooling	8. Heating and Cooling Systems
6. Ventilation	9. Ventilation
7. Baseloads	10. Baseload Measures
SWS for Mobile Homes	11. Mobile Homes
Not Explicitly in SWS	2. Energy Audits and Quality Control Inspections, 12. Air Leakage Diagnostics

# Mechanical Ventilation

- Termination fittings (367)
- Duct sizing—follow manufacturer's specs (369, 370)
- Attic ventilation (378)
- Ventilated crawlspace (381)
- Whole building ventilation (pg 361)
- Whole house fan specs (pg 365, 366)

# Standard Work Specifications



# Standard Work Specifications

- ASHRAE 62.2-2013
  - Any questions?
    - Spot ventilation vs Continuous
    - Spot ventilation deficit
    - Placement of fan matters

# Mechanical Ventilation

- Any questions?
- Please take a moment to fill out any input forms you have.

# Baseload Measures

Bookmarks

- Table of Contents
- Chapter 1: Health and Safety
- Chapter 2: Energy Audits and Quality Control Inspections
- Chapter 3: Weatherization Materials
- Chapter 4: Attics and Roofs
- Chapter 5: Walls
- Chapter 6: Floors and Foundations
- Chapter 7: Windows and Doors
- Chapter 8: Heating and Cooling Systems
- Chapter 9: Ventilation
- Chapter 10: Baseload Measures**
  - Table 10-1: Levels of Household Electric Baseload Consumption
  - Table 10-2: Electrical Consumption of Typical Appliances
  - 10.1 Refrigerator Replacement and Maintenance
  - 10.2 Entertainment and Computer Systems**
  - 10.3 Lighting-Efficiency Improvements
  - 10.4 Water-Heating Energy Savings
  - 10.5 Selecting Storage Water Heaters
  - 10.6 Alternative Water-Heaters
  - 10.7 Water Heater Installation
  - 10.8 Comparing Water Heaters
  - 10.9 SWS Alignment
- Chapter 11: Mobile Homes
- Chapter 12: Air Leakage Diagnostics
- Appendices
  - Glossary
  - Index

## CHAPTER 10: BASELOAD MEASURES

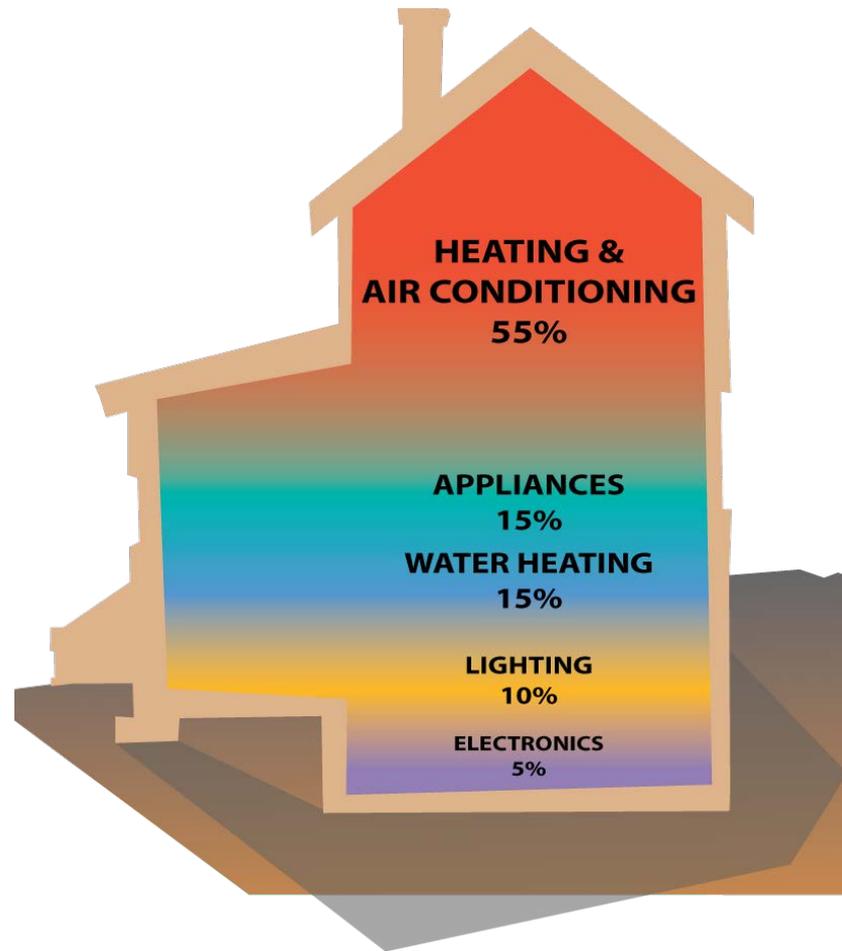
Baseload energy consumption accounts for a large part of home energy use. This chapter discusses energy savings for refrigeration, entertainment, lighting, laundry, and water heating.

Table 10-1: Levels of Household Electric Baseload Consumption

Indicator	Low	Medium	High
kWh per Year	<4500	4500-8500	>8500
kWh per Month	<375	375-700	>700
kWh per Day	<12	12-23	>23
kWh per Person (Annual)	<1900	1900-3500	>3500

Doesn't include heating, cooling, or water heating. Assumes 2.4 persons per household and average annual consumption of 6500 kWh per household.

# Baseload Measures



# Baseload Measures

- Refrigerators
  - Client Education pg. 380
  - Clean and Tune pg. 381
  - Metering when possible pg. 383
    - Using data plate when not possible VARIANCE REQUESTED
- Lighting
  - LED Update pg. WA
  - Considerations pg. 387
    - “Make sure customer is satisfied with light level”

# Baseload Measures

- Dryer Venting pg. 388
  - Compare SWS to Field Guide

# Baseload Measures

- Water Heater Energy Usage
  - Reference our required tests,
    - Water temp.
    - R value a required input
    - Measuring shower head flow—Not currently required
  - Blankets—let WA determine
    - Determining insulation level pg. 394 & 399
  - Heat Traps
    - Are they built into the water heater?
    - We are considering how this will impact WAP.

# Baseload Measures

- Water Heater Selection
  - Energy factor—where does this come from? pg. 399
  - Power Vent verses Direct Vent pg. 400
  - On Demand—no way to model them in WA
  - Install of DWH pg. 403
    - Most aren't a big deal
    - Expansion tank? VARIANCE REQUEST
  - Comparing WH pg. 404

# Baseload Measures

- Any questions?
- Please take a moment to fill out any input forms you have.
- Break time!!