

COOPERATIVE EXTENSION  
Washington State



University

ENERGY PROGRAM



*Building Standards  
& Science Group*

# Washington State Indoor Air Quality Code Whole House Ventilation Systems:

## RESEARCH RESULTS



# Washington State University

## Cooperative Extension Energy Program

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**Prepared by:**

**John Devine, WSU Energy Program**

**360-956-2095**

**[devinej@energy.wsu.edu](mailto:devinej@energy.wsu.edu)**

**Web Site: [www.energy.wsu.edu](http://www.energy.wsu.edu)**

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## Code Basics

- General Requirements
- Whole House Ventilation

## Telephone Survey

- Methodology
- Results

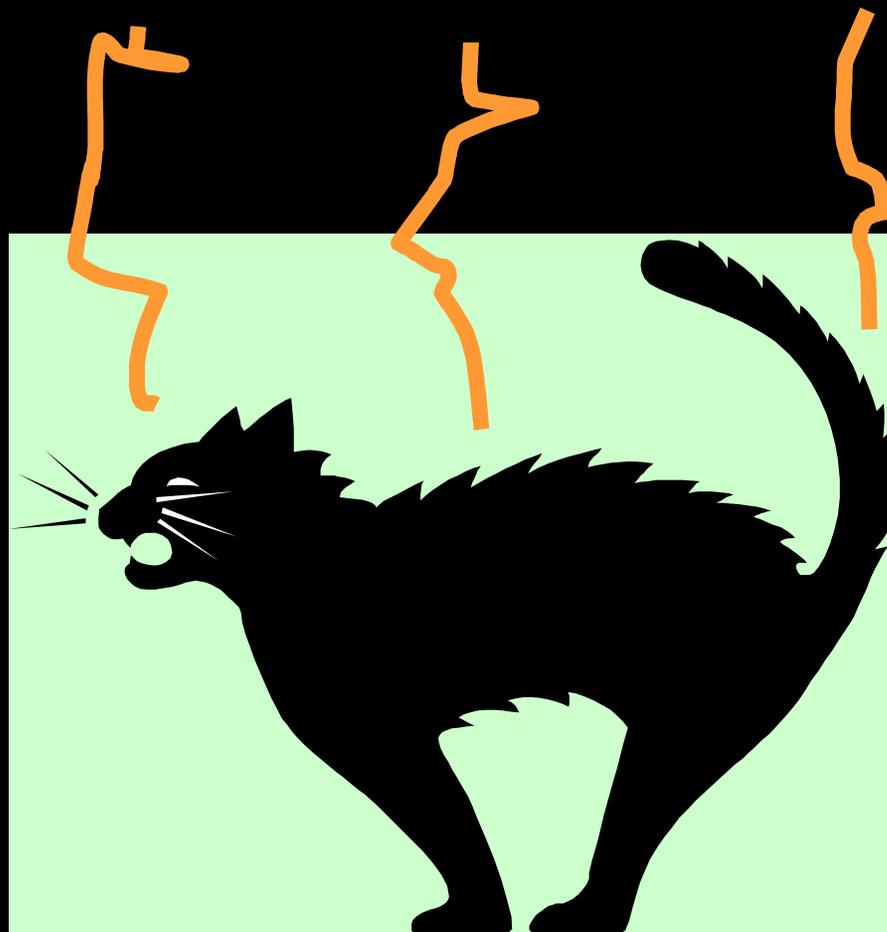
## Field Survey

- Methodology
- Results

## Opportunities



“Because it smells better than cat.”



# Key Acronym

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What IS The

Ventilation &

Indoor

Air

Quality

Code ????

# The Code: Washington's VIAQ Basics

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## Radon Resistive Construction

- Testing, Mitigation, & Resistive Construction

## Indoor Air Quality

- Solid Fuel Burning Appliances & Formaldehyde

## Mechanical Ventilation

- Source Specific & Whole House

# Washington's Mechanical Ventilation Requirements

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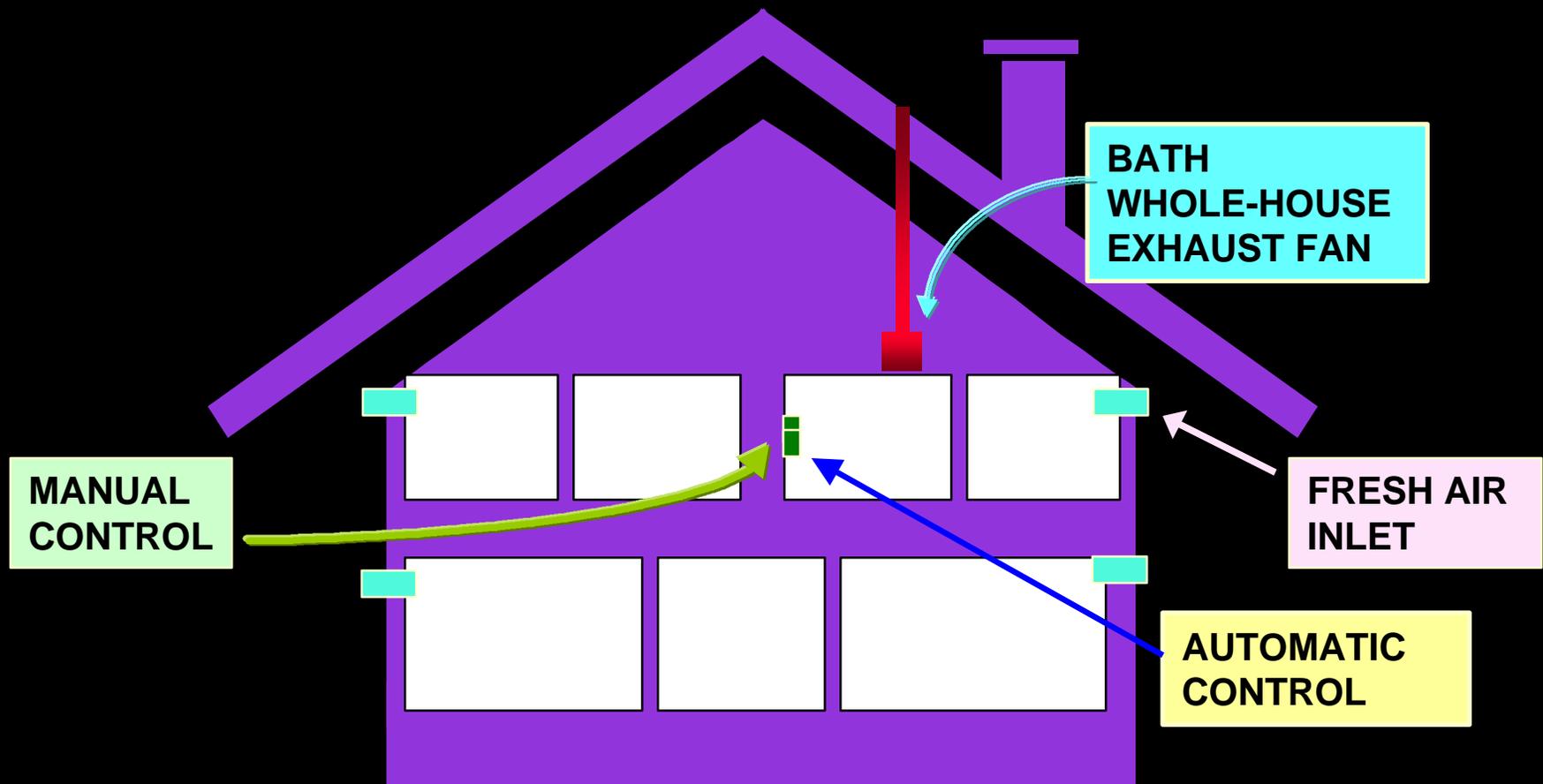


## Whole House Ventilation

- .35 - .50 ACH
- Fresh air to all habitable spaces
- Applies to most "R" Occupancies

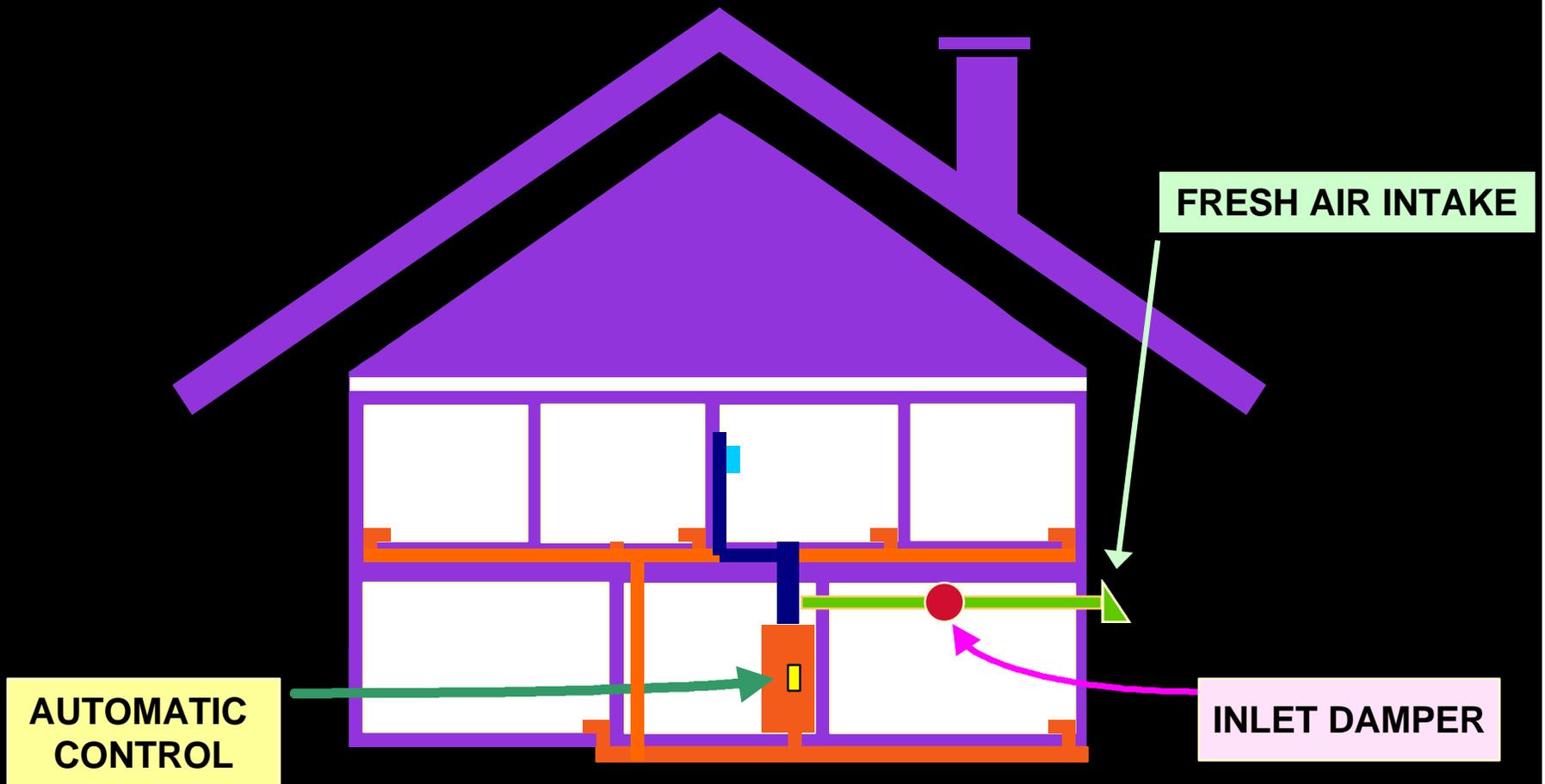
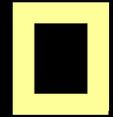
# Intermittent Exhaust Whole House Ventilation System

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# Integrated with the Forced Air Heating System

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# Why Did We Conduct the Telephone Survey ?

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- **We heard that the systems caused drafts.**
- **We heard that people disconnected them.**
- **We heard others didn't use them.**
- **We knew the code was not always understood.**

# Telephone Survey Hypothesis

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## **Homeowners:**

- **Are unaware, dislike, or don't know how to use their ventilation systems**
- **Misunderstand or are unconcerned about IAQ**

# Kinds of Questions We Asked

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- **Where is your timer?**
- **How often do you adjust it?**
- **Has any part needed repairs?**
- **How many hours does it run?**

# Telephone Survey Sample

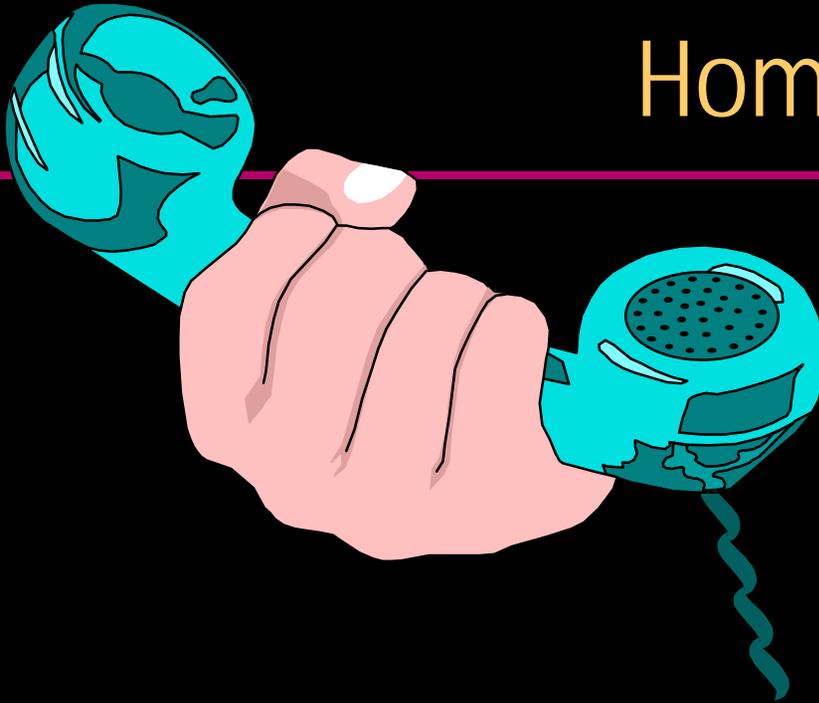
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- **Selected by County**
- **Selected by Heating System Type**
- **Selected by Year Built**
- **235 Subjects Interviewed**

# Homeowners Say:

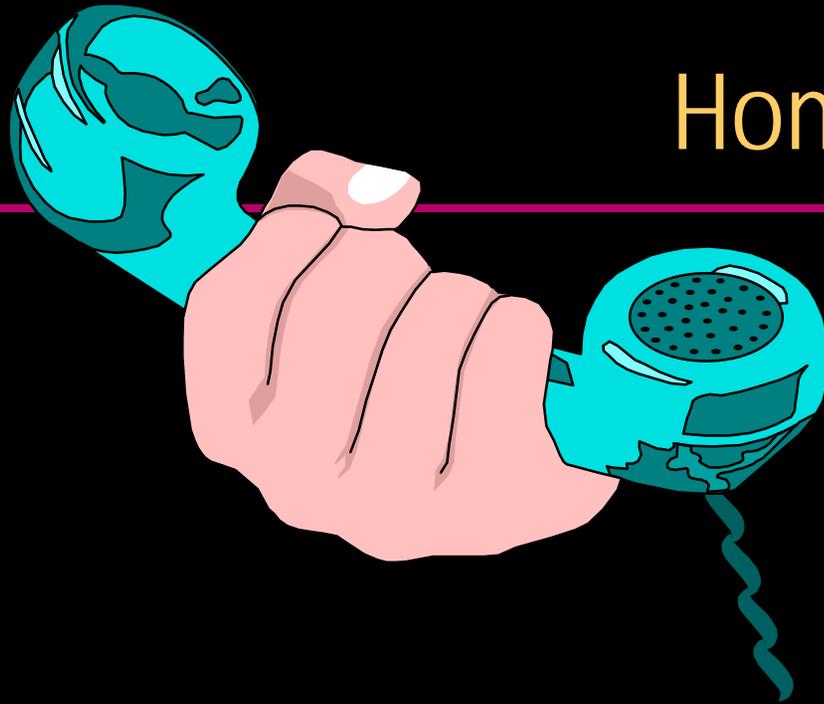
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- **Their houses have good IAQ. (81%)**
- **They like their systems. (64%)**
- **They operate their systems 3.4 Hours per day.**

# Homeowners Say:

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- Fresh air is important for health. (67%)
- Their system works as well as ever (95%)
- They don't have a ventilation system that brings in fresh air (24%)

# Questions that weren't Answered

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- **What type of system do you have?**
- **What system is most understood?**

# Field Study Follow-up

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- **Are the systems installed properly?**
- **Are the systems functioning properly?**
- **Do the systems waste energy?**

# Hypothesis

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## Ventilation Systems:

- Are not installed according to code
- Waste energy as installed

# The Field Study

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- **138 volunteered for the study**
- **Data collected at 31 homes**
- **Tested Ducts, air leakage and ventilation systems**
- **Looked at Energy and VIAQ code compliance**

# Field Study Findings

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- **Ventilation System ACH**
- **Air Leakage Rates**
- **Code Compliance**
- **Energy Impacts**

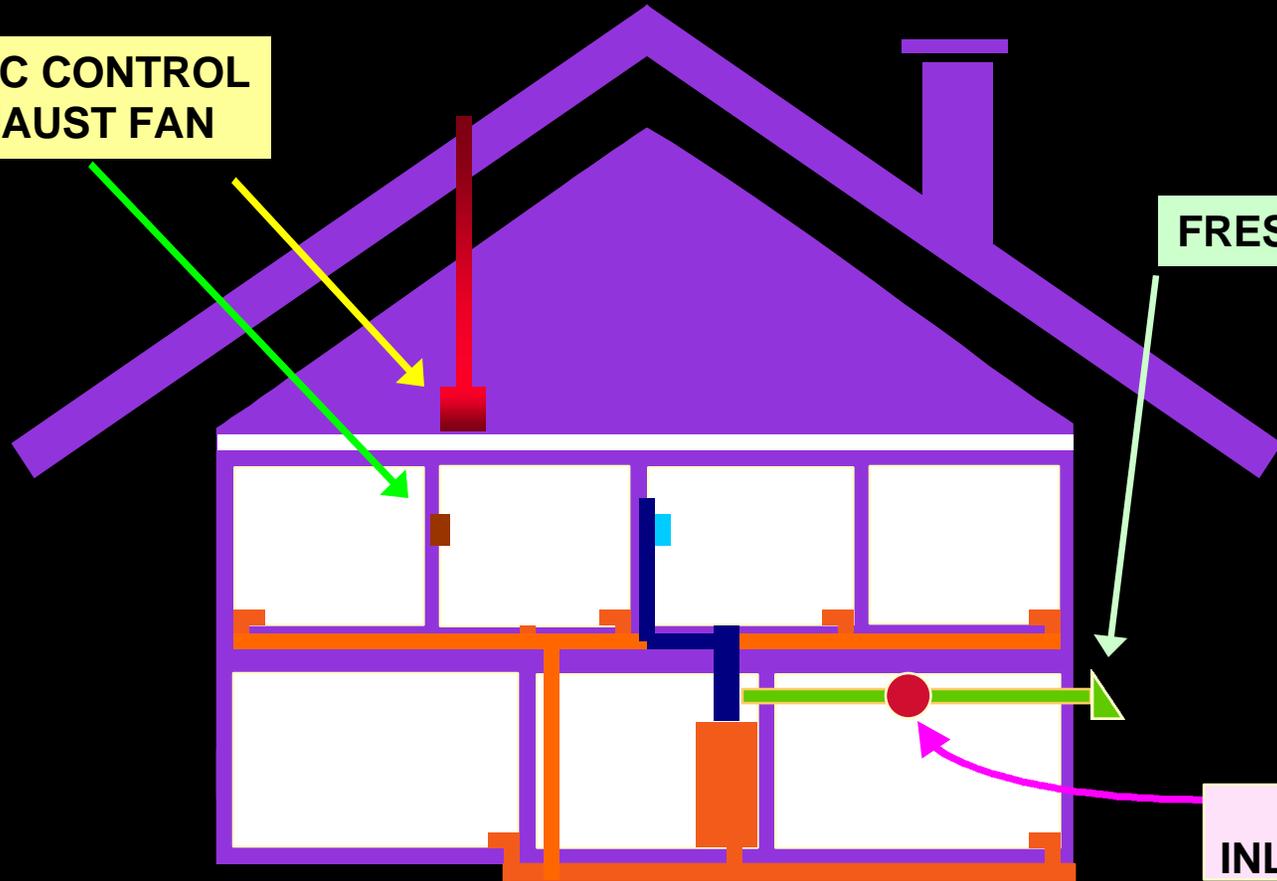
# Energy Wasting Integrated with Forced Air Heating Systems



**AUTOMATIC CONTROL AND EXHAUST FAN**

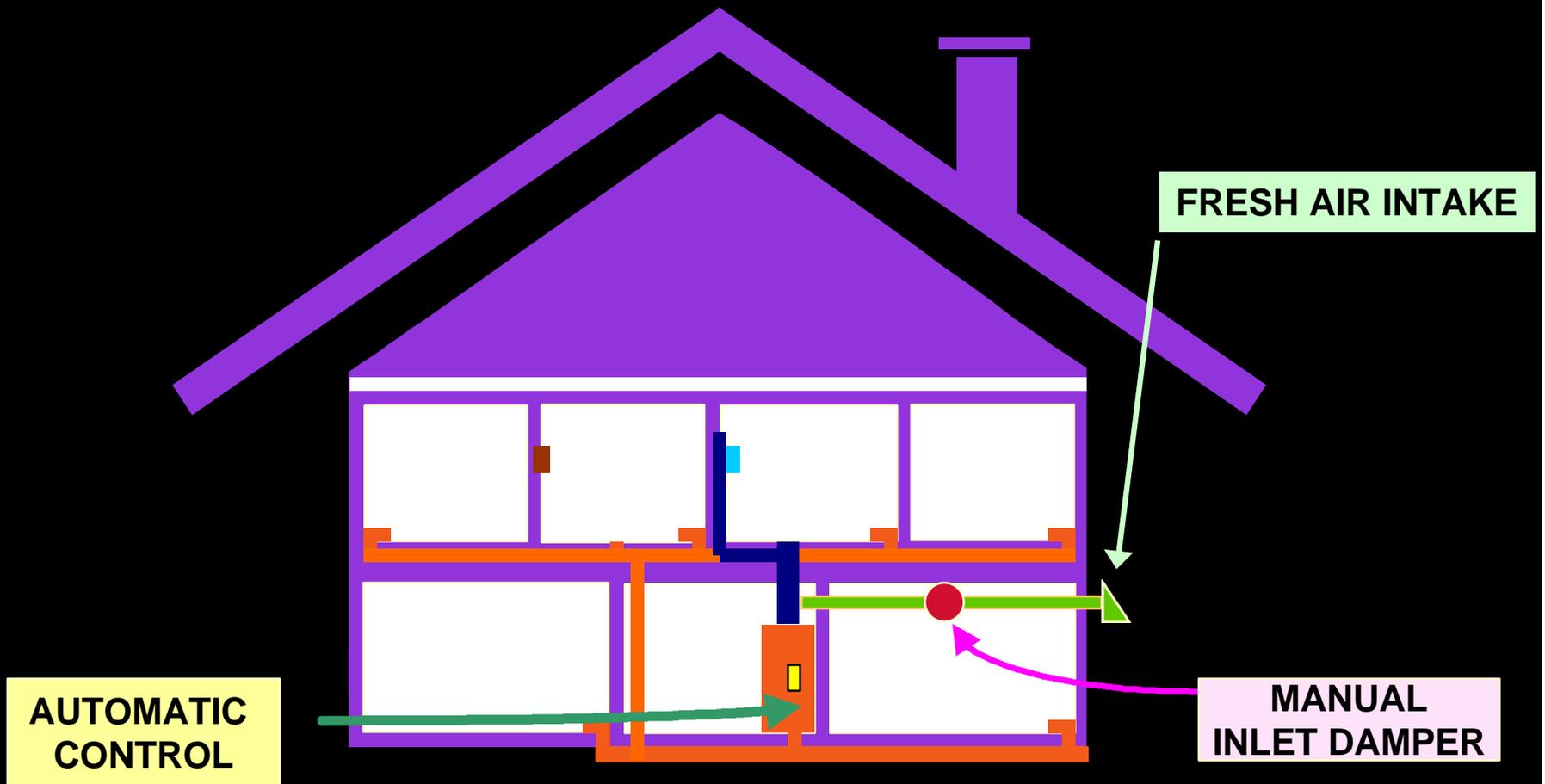
**FRESH AIR INTAKE**

**MANUAL INLET DAMPER**



# Energy Wasting Integrated with Forced Air Heating Systems

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# Action Items

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**Results from the study  
will be used to:**



- **formulate amendments**
- **provide information to other states**
- **develop VIAQ educational materials**

# COOPERATIVE EXTENSION Washington State



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**John Devine, Codes Tech Lead**

**360-956-2095**

**devinej@energy.wsu.edu**

**Web Site: [www.energy.wsu.edu](http://www.energy.wsu.edu)**