

# Retrofitting Residential Properties (1-4 unit homes)

Special Challenges, cost-benefit analyses and solutions

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# Houses leak heat



# The more heat loss, the more ice melt

## National Geographic Drawing



# How many houses leak heat?



# An “easy” house retrofit will pay for itself quickly

## Energy Retrofit Priorities

(chart stolen from Michael Blasnik, 2011)

| <b>Retrofit</b>                                       | <b>Cost</b> | <b>\$/yr save</b> | <b>Lbs. CO2/yr saved</b> |
|---|-------------|-------------------|--------------------------|
| Insulate empty attic (air-seal) 1000 ft <sup>2</sup>  | \$1,000     | \$400             | 2600                     |
| Insulate empty walls Dense pack, 1000 ft <sup>2</sup> | \$1,200     | \$350             | 2200                     |
| Insulate attic: add to existing (and air-seal)        | \$800       | \$125             | 700                      |
| AIRSEAL using BLOWER DOOR                             | \$600       | \$75-\$250        | 500-1600                 |

What is an easy  
house?

# A box



# “Easy” Houses will have:

- Unfinished attic
- Unfinished basement
- No duct work in attic
- No recessed lights in attic floor
- No skylight or whole house fan
- No knee walls
- No flat roofs
- No dormers
- No cathedral ceilings
- No additions
- No back plaster in walls



# For a “complicated” attic, get:

- A second opinion from an independent expert because MassSAVE energy specialists will typically tell you only what the MassSAVE program covers. You get the truth but not the whole truth.
- **The best air-sealer:** The best air-sealer uses a blower-door and smoke stick to check his work. (MassSAVE does not require this from their air-sealers)

# MassSAVE:

- Is one of the main reasons that Massachusetts is the most successful weatherization state in the country
- 85% effective

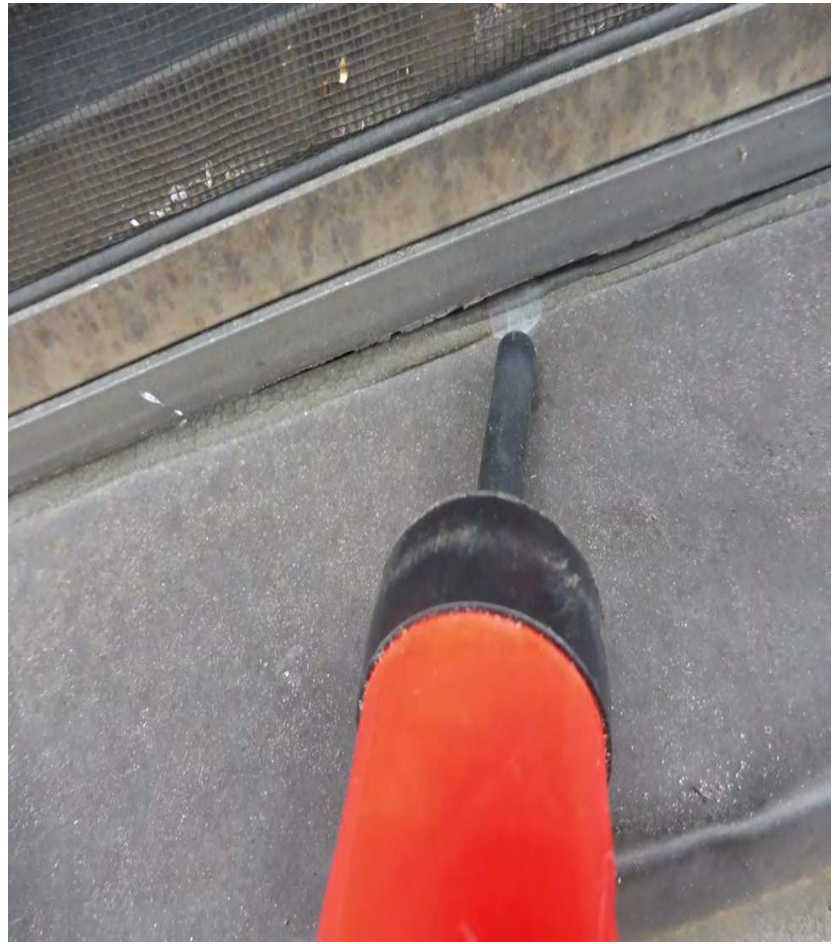
# Complicated Houses





To fix this you need:





# An Ode to the Blower Door

O, Blower Door

You red glowing beauty

Giver of wisdom

Revealer of mystery and hidden secrets

Perfection-maker

You lift me with your sweet lusty breeze

Though some may think that I'm a boor

I'll never stop my blower door.

# What can a blower door do?

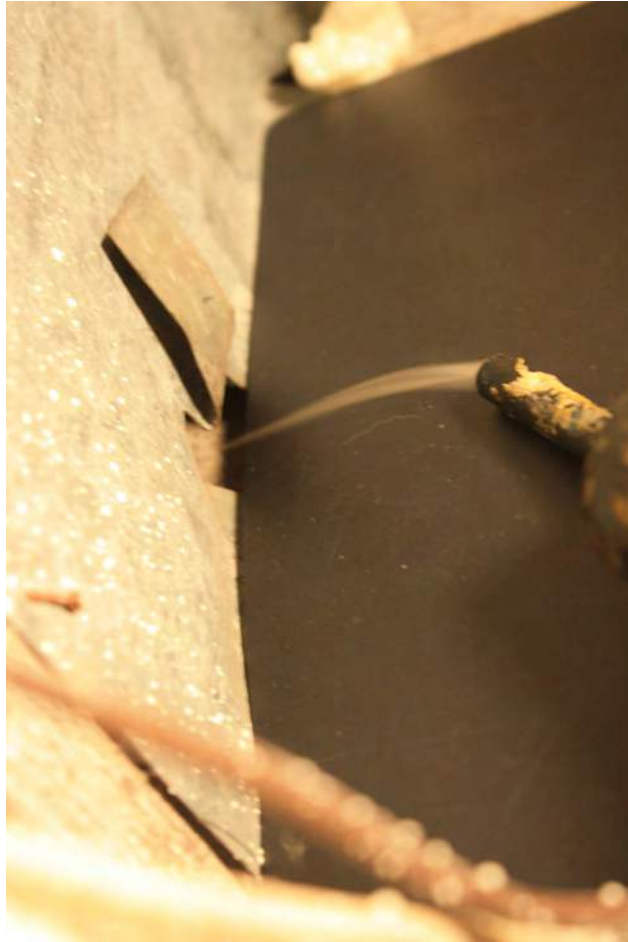




It quantifies the draftiness of a home



It helps you find holes



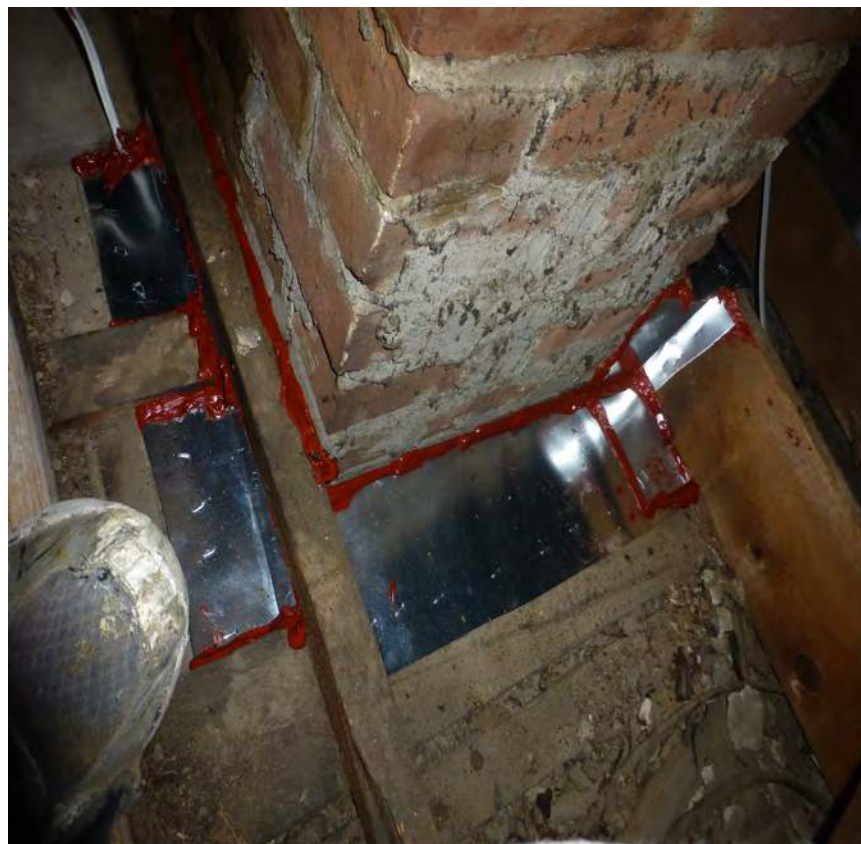




# The Mysterious and Wonderful world of Air-sealing

Ten Most Typical Places to Air-seal an Attic

# Chimney



# Recessed Lights



# Recessed Lights





# Bathroom Fan



# Stink Pipe/Wet Wall



# All Wall Tops



# Duct Work



# Duct Work



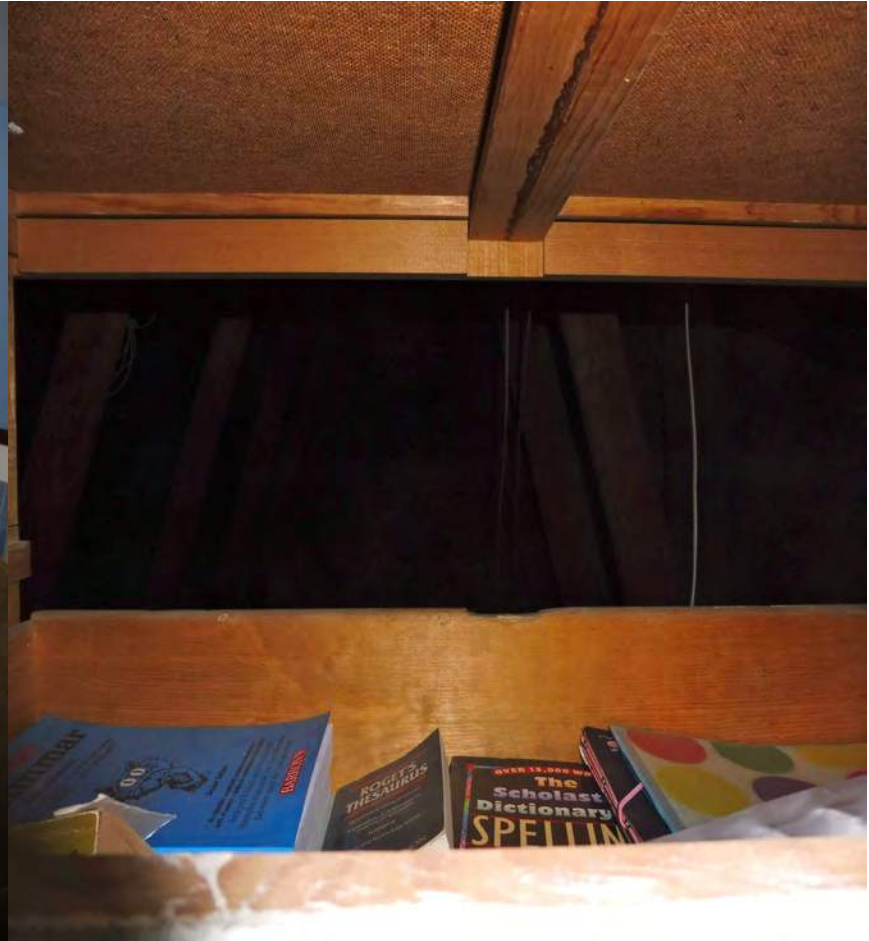
# Attic Entrances



# Gable Ends



# Surprises!!!





# Junction Boxes



## Part 2: Ten most typical places that need sealing in an attic

- Chimneys
- Recessed Lights
- Bathroom Fans (vents)
- Stink Pipe Chases
- Wet Walls (and all wall tops)
- Duct Work
- Attic Entrances
- Gable Ends
- Surprises
- Junction Boxes

# Three more Common Air-sealing Challenges

# Dropped Soffits



# Ceiling Height Changes



# Knee-Walled Spaces

