Fixing Existing Homes

Part 1

Dave Keefe

Part 1

- A brief history of energy retrofitting
- State of the art -- diagnostics
- State of the art – installations
- Misconceptions & complications

Part 2

- Physical and technical challenges
- Sales and marketing challenges
- Some comments on economics
- Group discussion
  - How do we improve quality?
  - How do we increase quantity?

We need to talk

- We’re all friends here, right?
- And we want the best for our state, our country, our world
- Climate change is hitting us here faster and stronger than we expected
  - Average winter temperature in Burlington has increased 7 degrees in less than 50 years
- Space heating of existing buildings is a big part of the fossil fuel (carbon) load in Vermont
- Fixing the existing buildings is essential

History

- Still a fledgling industry
  - There’s not many of us
- The Weatherization Assistance Program
- The 1970’s – birth
- The 1980’s – learning to crawl
- The 1990’s – growing up
- Since 2000 – trying to become mainstream

History

- Lessons learned
  - Moisture
  - Combustion safety
    - Chimneys
    - Carbon Monoxide
  - Indoor Air Quality
  - Ventilation

Current activity in Vermont

- Weatherization Assistance Program
  - About 800 jobs/yr, about $10K average
- Home Performance with ENERGY STAR
  - About 800 jobs/yr, about $8K average
- Limited info about average savings from those two programs, but probably about 20% or less
- Efficiency Vermont's attic/basement incentive, about 100 projects/yr, not comprehensive, quality uncertain
- Other projects outside of these programs

How are we doing?

- There are about 200,000 houses/small apt buildings in Vermont
- We are doing less than 2000 per year, less than 1%
- Average savings are probably less than 20%
- That means our effect is less than 0.2% per year
  - At that rate, it will take 250 years to cut usage in half
- Vermont's goal in 2008 was to get 25% savings in 80,000 homes by 2020. To do that, we would have had to do at least 5 times as much as we actually did

How are we doing?

- Should we assume we’re done with a building once we get 20% or so?
- How high are we aiming?

Action in 2019

- Last spring, the legislature allocated more money for weatherizing homes. Some of it went to WAP, some to EVT
- Efficiency Vermont has increased incentives, especially for moderate income households, and is recruiting and training new contractors. There is also financing with income-sensitive interest rates.
- One of the main limitations going forward is contractor capacity. We need many more people with the appropriate skills

State of the art -- Diagnostics

- Blower doors
  - Building tightness, interconnections, duct tightness
- Infrared
- Worst-case depressurization
- Carbon monoxide

State of the art -- Installations

- Moisture control
- Air sealing
- Dense-pack
- Spray foam
- Ventilation

How not to do attics

- A brief rant, please forgive me

Misconceptions

- Houses have to “breathe”, you don’t want them “too tight”
- Installing insulation is simple, any moron can do it
- The most skilled people should be the auditors
- Leaky houses are healthier
- If I’m going to have to borrow money to do it, it doesn’t make sense
- Of course, the windows need to be replaced
- My house doesn’t need anything, it’s only 20 years old

Complications

- People have to be pushed to do something now in exchange for a future benefit. We're not good at that. The default is always to do nothing
- The future benefit is uncertain. Maybe it can't be counted on
- Split incentives in rental situations
- Folks move a lot, and might not want to put money into a building they might sell sometime soon
- It doesn't make things look any better, there's nothing to show off
- It ain't sexy

If you're a home energy pro, you should check out

Homeenergypros.org

If you search under "Keefe" you'll find a short video you might like called "A Climate Report from the Field"