ENERGY FIT HOMES

Real savings. Lasting comfort.

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Energy Fit Homes℠

In accordance with the Department of Labor and Industry's statute 326.0981, Subd. 11,

"This educational offering is recognized by the Minnesota Department of Labor and Industry as satisfying **1.5 hours** of credit toward **Building Officials and Residential Contractors code/energy** continuing education requirements."

For additional continuing education approvals, please see your credit tracking card.

Certification Program Partnership

cee
Center for Energy and Environment

nec
Neighborhood Energy Connection
making energy conservation easy

Outline

- Why Energy Fit Homes was created
- Energy Fitness Score
- Energy Fit Homes requirements and process
- Current status and case studies
- Future plans
- Questions

Why Energy Fit Homes was created?

Energy Fit Homes

We are still moving too slowly…

Minnesotans waste over $55 million/year just from insufficient insulation levels in existing homes

We need accelerators to drive demand.

Tools that incorporate the value of efficiency in home sales transactions

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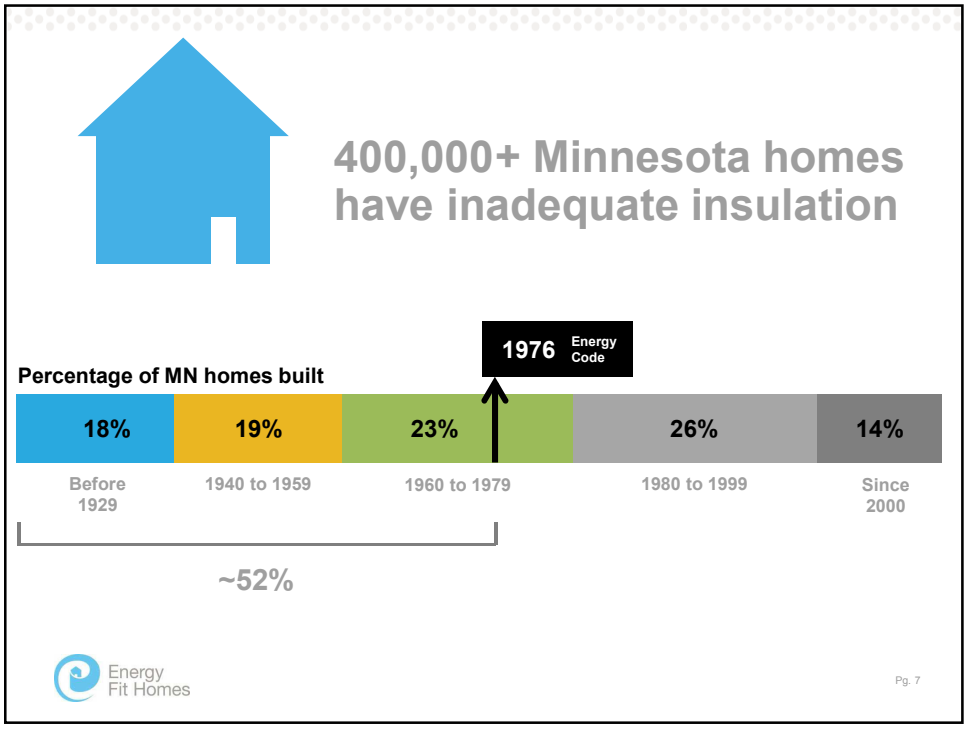
400,000+ Minnesota homes have inadequate insulation
1976 Energy Code
Percentage of MN homes built
18%
19%
23%
26%
14%
Before 1929
1940 to 1959
1960 to 1979
1980 to 1999
Since 2000
~52%
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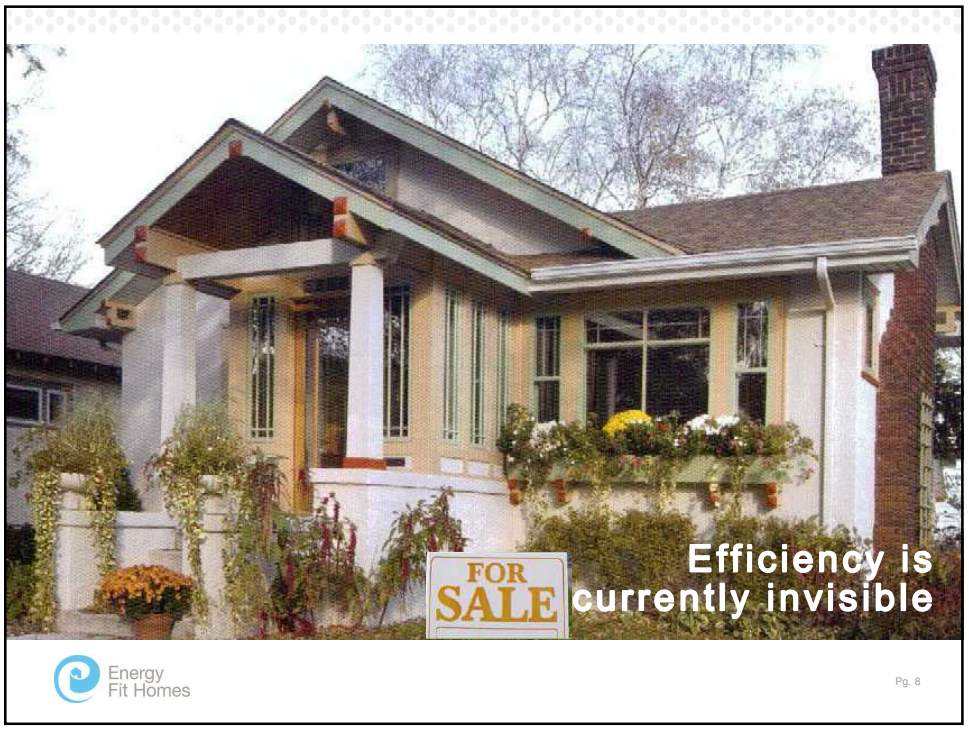
FOR SALE
Efficiency is currently invisible
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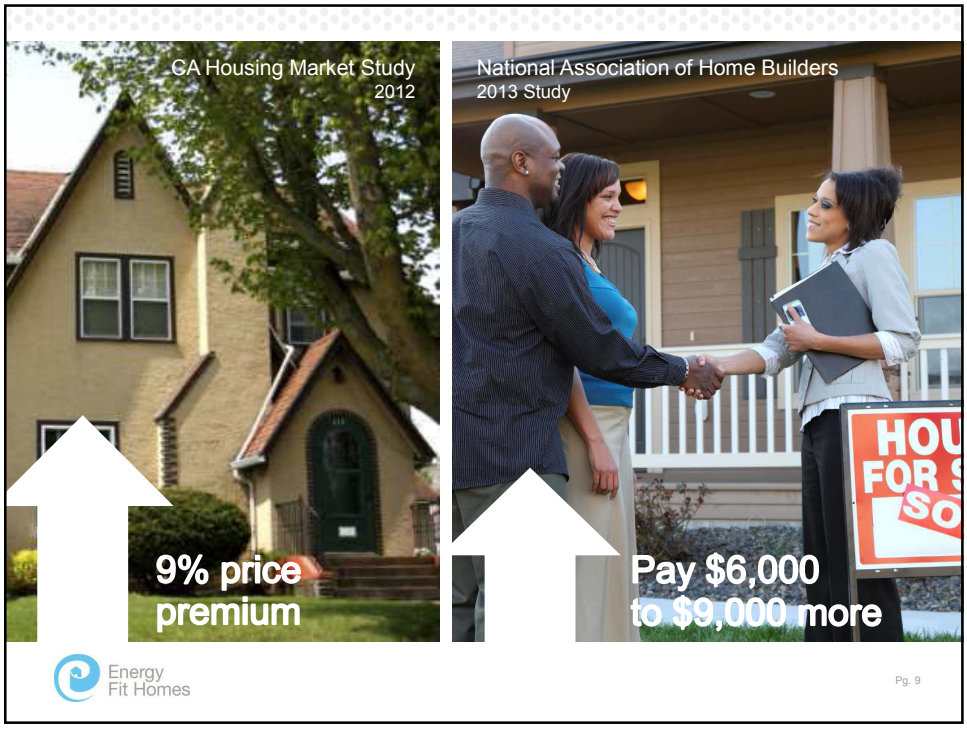

Current Certifications

MINNESOTA green communities™

HOMES DESIGN AND CONSTRUCTION LEED

energy LEARN MORE AT energystar.gov

MINNESOTA'S green PATH

mngreenstar Certified Green Homes and Remodeling

HERS Home Energy Rating System

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Shortcomings in certification market

- Designed for new construction
- Not necessarily grounded in cost-effectiveness
- Complex requirements/criteria
  - Broader than energy efficiency
- Expensive processes

↳ Make it difficult to achieve scale

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Energy Fit Homes℠

Real savings. Lasting comfort.

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What Distinguishes Energy Fit Homes?

1. Designed for existing homes
   - Doesn't disadvantage older homes
   - Every home can meet standards
2. Focused specifically on energy efficiency
3. Tied to existing utility efficiency programs

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Cost Effective Improvements

- Pays for itself in energy savings over lifetime of the improvement
- Significantly improves the Indoor air quality, comfort or durability of the home

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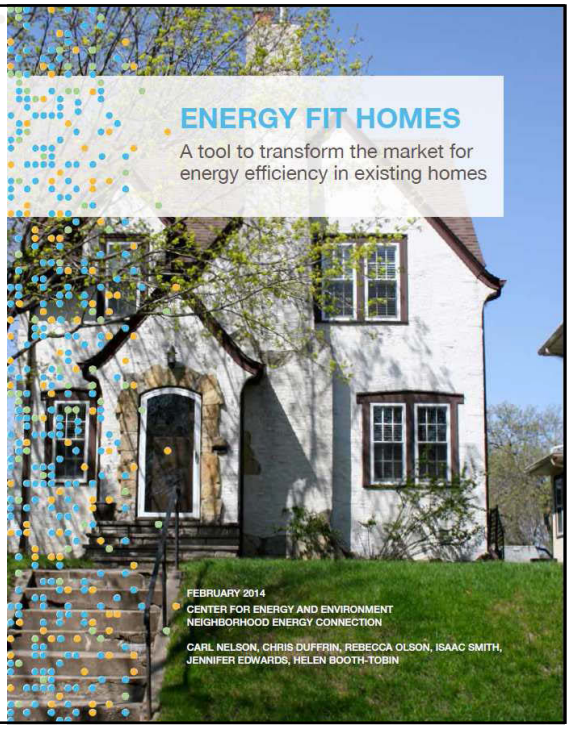
Report on website



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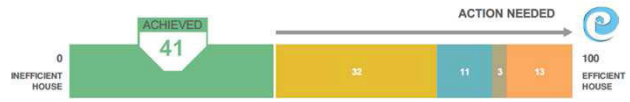
Energy Fitness Score

YOUR ENERGY FITNESS SCORE



ACHIEVED	ACTION NEEDED *by priority*	COST ($)	REBATE ($)
80% AFUE heating system	Insulate your exterior walls	2625 - 3150	300
Partial attic insulation and air sealing	Air seal and insulate your attic	3650 - 4375	500
Approximately 79% of windows meet minimum efficiency standards	Add storm windows to your single-pane windows	-	-
	Replace your furnace with 95% AFUE model before failure	3500 - 6000	400

- Score developed to outline a clear pathway to certification
- Visual representation of energy saving priorities

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Energy Fitness Score

- Point distribution is based on housing type
- Individual housing types were modeled to determine proper distribution
  - Specific to Minnesota climate
  - Developed using the SIMPLE Model by Michael Blasnik

House Type	Attic	Air Sealing	Wall	Heating	Windows	Total
1 story	20	8	32	28	12	100
1.5 Story	27	10	26	26	11	100
2 Story	12	9	40	27	12	100

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Energy Fitness Score

- Modeling each housing type

1 Story
1,700 sq ft
2 bedroom
Typical window Area
Gas Water Heater
Gas Furnace (80 AFUE)
Air Leakage: 1.25 ALR
Wall: R-7
Attic R-20
Double/Storm Windows
No Basement Ins

5 Categories	Low - High
Attic	R-10 – R-50
Wall	R-5 – R-11
Air Sealing	1.7 – 1.3
Heater	70 – 90
Windows	Single – Double

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Energy Fitness Score

- Calculating point distribution

1 story home

Category	Low - High	Energy Savings	% of Savings
Attic	R-10 – R-50	152 therms	20
Wall	R-5 – R-11	247 therms	32
Air Sealing	1.7 – 1.3	63 therms	8
Heater	70 – 90	213 therms	28
Windows	Single – Double	87 therms	12
Total		762 therms	100

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Energy Fitness Score

2 story

Category	Energy Savings	% of Savings
Attic	160 therms	12
Wall	518 therms	40
Air Sealing	117 therms	9
Heater	357 therms	27
Windows	157 therms	12
Total	1587 therms	100

1.5 Story

Category	Energy Savings	% of Savings
Attic	300 therms	27
Wall	281 therms	26
Air Sealing	106 therms	10
Heater	290 therms	26
Windows	120 therms	11
Total	1450 therms	100

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Energy Fitness Score

Calculating the homes' score –

- Score is calculated within each category
- Determined by where the home is within the low to high range for that category

- Attic Example: 1 Story Home, R-22
  - Evaluate where R-22 is within R-10 to R-50
  - Use U-value (1/R-value) when calculating insulation categories
  - 14 out of 20 points for the attic

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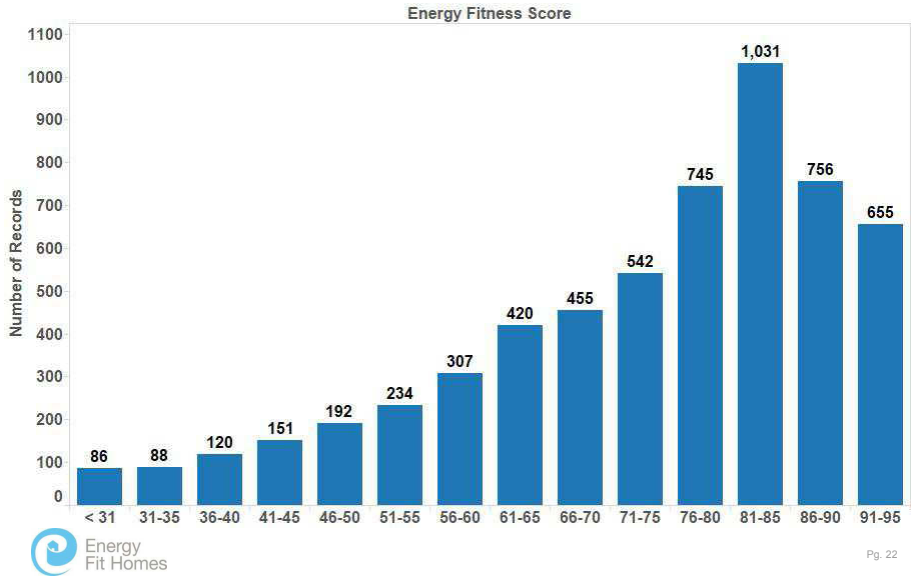
Energy Fitness Score – Home Scores



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- Must score 96 or higher
- Achieve additional requirements:

HEALTH & SAFETY

ACHIEVED	ACTION NEEDED	COST ($)	REBATE ($)
Water heater passed combustion safety testing	Install continuous indoor ventilation	600 - 800	-

EFFICIENT PRODUCTS

ACHIEVED	ACTION NEEDED
Efficient lighting Programmable Thermostat	

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What are the requirements and process for Certification?

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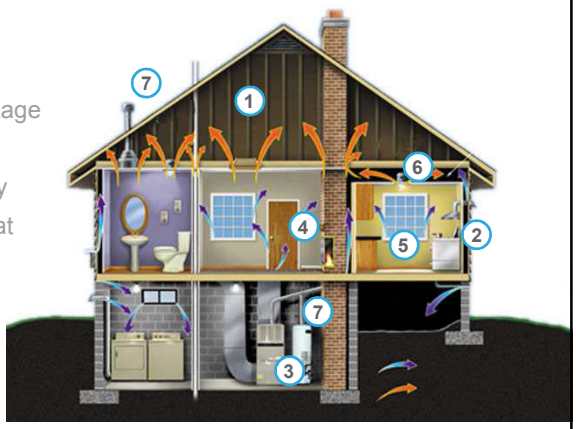
Certification Components

1. Attic Insulation & Air Leakage
2. Wall Insulation
3. Heating System Efficiency
4. Programmable Thermostat
5. Windows
6. Efficient Lighting
7. Combustion Safety & Ventilation



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Energy Fitness Plan

For: Paul Doe, Melissa Doe
124 Sesame Street N, Edina, MN 00000

By: .
Date: Sep 10, 2014

YOUR ENERGY FITNESS SCORE

ACHIEVED	ACTION NEEDED *by priority*	COST ($)	REBATE ($)
Walls are fully insulated	Air seal and insulate your attic	1900 - 2275	500
Windows meet minimum efficiency standards	Replace your furnace with 95% AFUE model before failure	3500 - 6000	400
Partial attic insulation and air sealing			
80% AFUE heating system			

HEALTH & SAFETY

ACHIEVED	ACTION NEEDED	COST ($)	REBATE ($)
Water heater passed combustion safety testing			
Adequate indoor ventilation			

EFFICIENT PRODUCTS

ACHIEVED	ACTION NEEDED
Efficient lighting	
Programmable Thermostat	

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Summary of Certification Requirements

Category	Requirement
Attic insulation and air sealing	Attic insulation is R-49 when possible, given existing space restrictions Attic bypasses are sealed, as measured by visual inspection or blower door testing Some flexibility allowed, as long as Home Energy Fitness score is greater than 95
Wall insulation	Walls are insulated to capacity (without expanding the wall cavity) Some flexibility allowed, as long as Home Energy Fitness score is greater than 95
Heating equipment	Furnace/boiler at least 90% efficiency Programmable thermostat is installed
Windows	Windows are single-pane windows plus storm, or better
Lighting	At least 50% of lighting in permanent fixtures is efficient (CFLs or LEDs)
Ventilation	Home receives adequate fresh air, or has appropriate exhaust fan for added ventilation
Combustion safety	Furnace/boiler and hot water heater meet combustion safety requirements, or are closed combustion appliances

Steps for Certification

- ☑ Receive a home energy assessment & a *Home Energy Fitness Plan*
- ☑ Complete work recommended by the *Home Energy Fitness Plan*
- ☑ Complete Certificate application

**** Receive your Certificate ****

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Score/Certificate Delivery

- Score delivery is integrated into existing Utility assessment programs—no additional cost
- Certificate issued as part of Quality Assurance programs implemented by NEC and CEE—low or not cost options for certification
- Currently being delivered primarily in the Metro, with some outstate work

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CERTIFIED

Date Awarded
12/10/2014

Expiration Date
12/10/2021

123 Sesame Street, Minneapolis MN 55555

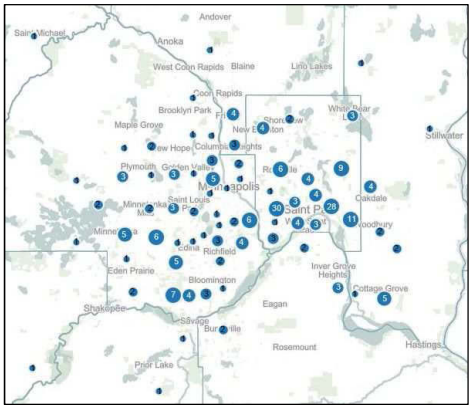
Has successfully achieved the requirements of Energy Fit Homes as established and verified by the Center for Energy and Environment in partnership with Neighborhood Energy Connection. An Energy Fit Home has reached a basic standard of energy efficiency, with all improvements done to meet health and safety standards.

Energy Fit Homes

Paul Doe,
Program Coordinator

Progress to Date

- Approximately 7,000 homes scored since 2014
- 253 certified homes - 217 in Metro and 36 outstate
- Outreach to over 500 realtors, several cities, and a few homebuyer class instructors



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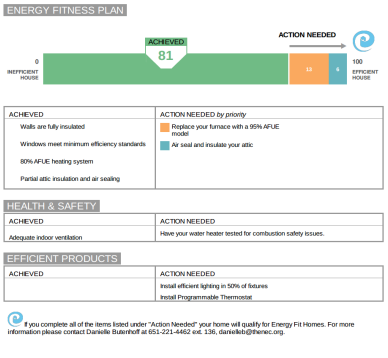
What percentage of homes already qualify?

- 35% of households qualified at initial assessment/audit
  - Factors contributing to certification at initial assessment:
    - Past participation in an EE program
    - Newer construction
- 65% of households qualified after some sort of program participation (i.e. energy efficient loan, HPwES, Minneapolis Pilot, Utility rebate program, etc.)

Energy Fit Homes

Case Study 1

- Roseville Rambler
- Built in 1950
- Score from 81-97
- Replaced 80% furnace with 96% Model with programmable t-stat
- Added R18 of attic insulation
- 15% air leakage reduction from attic bypass sealing
- Replaced water heater with power vented unit for combustion safety
- Had Home Energy Squad install CFLs
- Total Cost: $6,000
- Modeled Savings: $307/year



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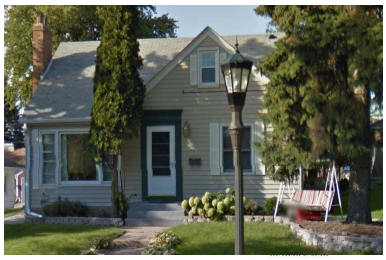
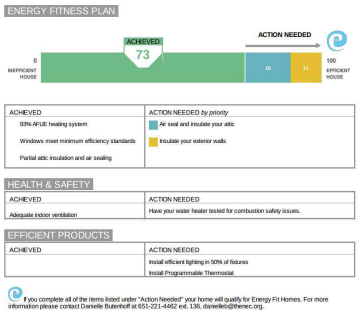
Case Study 2

- St. Paul 1.5 story
- Built in 1949
- Score from 73-100
- Added R29 in peak, R25 on kneewalls, R45 in side attics and dense packed slants
- 48% air leakage reduction from attic bypass sealing
- Dense packed exterior walls
- Replaced water heater with power vented unit for combustion safety
- Had Home Energy Squad install CFLs and programmable t-stat
- Total Cost: $4,360
- Modeled Savings: $579/year





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Case Study 3

- West St. Paul Split Level
- Built in 1963
- Score from 45-100
- Replaced 60% furnace with 95% Model
- Added R29 of attic insulation
- 36% air leakage reduction from attic bypass and rim joist sealing
- Dense packed exterior walls and tuck under garage ceiling
- Replaced water heater with power vented unit for combustion safety
- Had Home Energy Squad install CFLs
- Total Cost: $8,870
- Modeled Savings: $724/year

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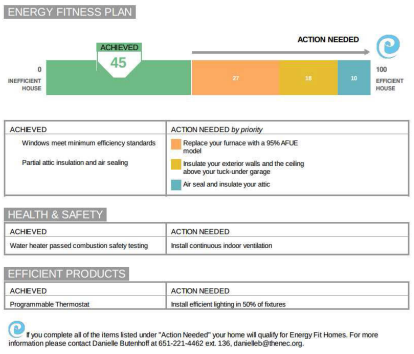

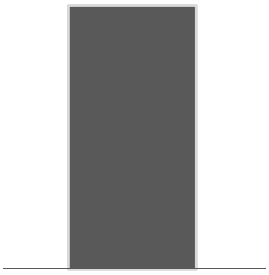

Average Non-certified Minnesota Homes

Annual Energy Costs $1,500 to $2,000

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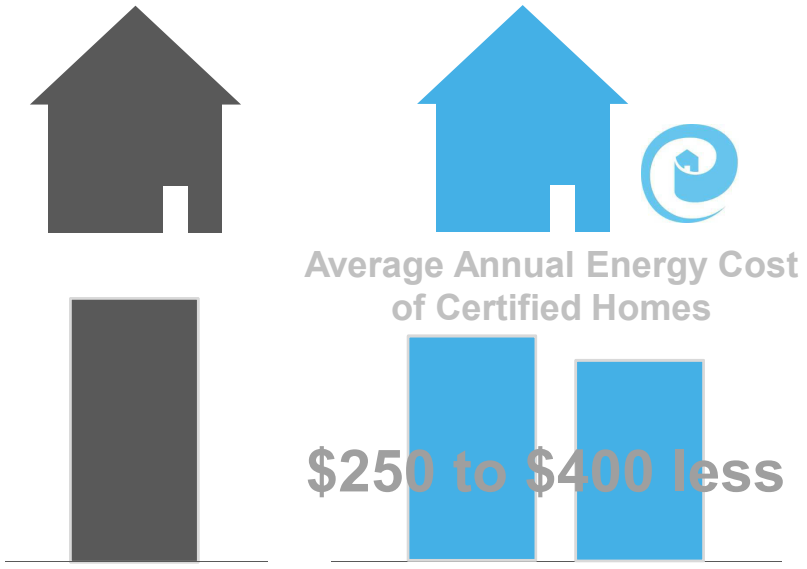

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Potential Barriers to Certification

- Ventilation misunderstood and not valued by the market
- Ventilation can be difficult and costly to complete as a stand alone measure
- Many boilers are relatively new and less than 90% due to cost issues with the condensing boiler market
- People complete projects in stages and often prioritize attics over walls, never completing the wall insulation work
- Some attic air sealing is not up to par, but attic insulation is adequate, so people aren't compelled to do air sealing as a standalone measure
- Existing, but inadequate, wall insulation

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Expansion and Outreach Plans

- Work with more utilities and audit companies to incorporate score into audit programs
- Work with Cities to encourage partnership on outreach and incentive for residents to achieve certification (i.e. $100 bonus rebate from City for EFH Certified home)
- Continue to work with Realtors to use EFH Certification as selling tool
- Set up online portal for realtors and buyers to look up certified properties
- Work with home performance contractors on marketing ideas for certification to encourage larger scopes of work
- Potentially develop home inspector protocol to score homes on the market

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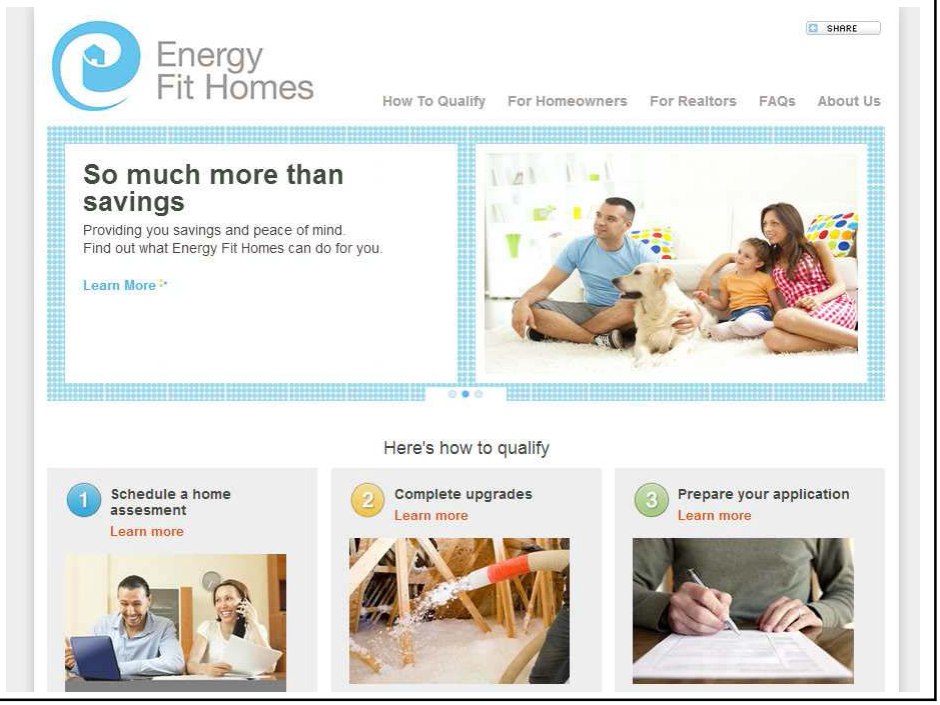

THANK YOU

mnenergyfit.org

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