



BUILDING ENERGY SAVING ORDINANCE (BESO)

EFFECTIVE DEC. 1, 2015

Findings through Nov. 2016



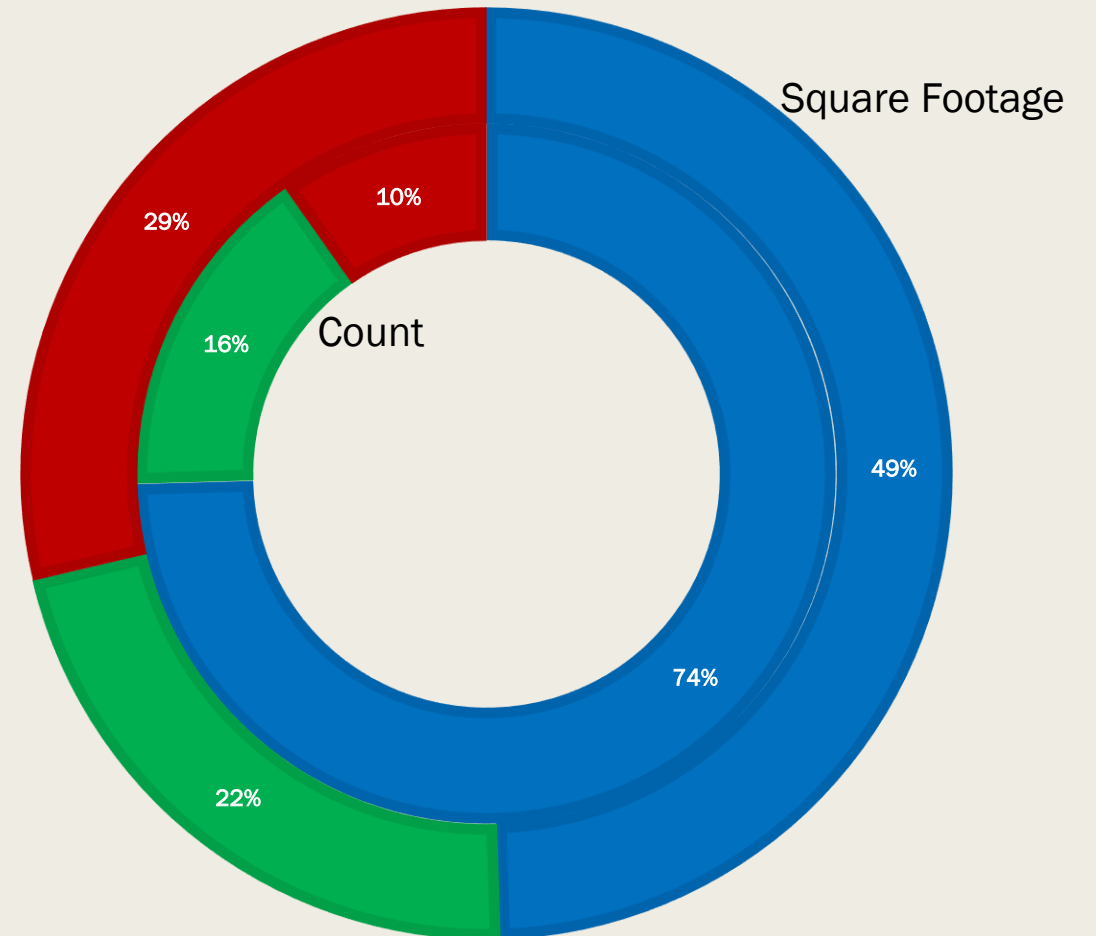
BESO Basics

- BESO requires Berkeley building owners to complete energy efficiency opportunity assessments and publicly report the building's energy efficiency information with the goal of helping building owners save energy and motivating them to participate in whole-building energy efficiency programs, such as Energy Upgrade California.
- It provides valuable building stock data to the city, including status of building envelopes and heating equipment.
- Gives building owners a clear path forward for upgrading their buildings to meet current best practices for energy efficiency.

Berkeley Building Stock

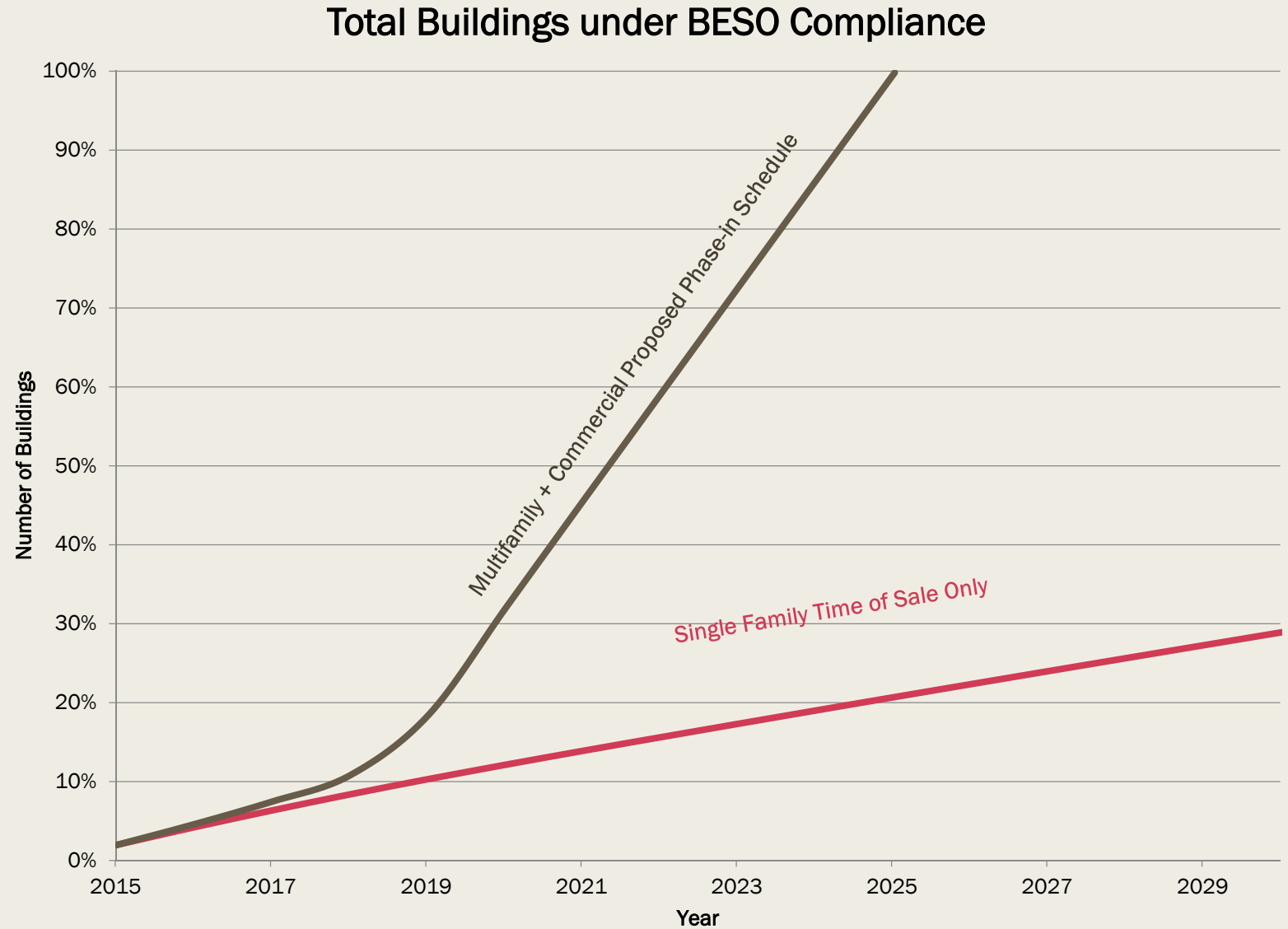
■ Single Family ■ Multifamily ■ Commercial

- Approx. 30,000 buildings total
- 21,000 single-family
- 4,400 multifamily
- 2,800 commercial & mixed-use



BESO Basics – Year 1

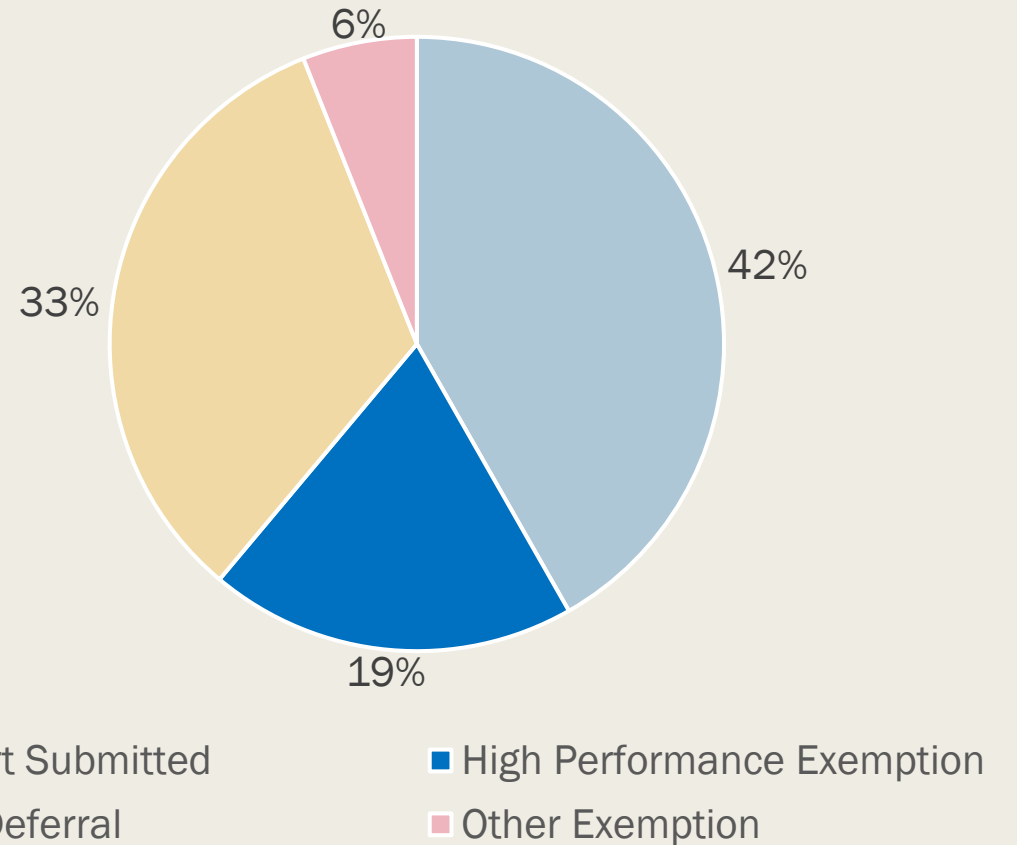
- 909 single-family applied
- 104 small/medium
 - *54 multifamily*
- 43 commercial
- 4% of single-family buildings covered by TOS



BESO Basics

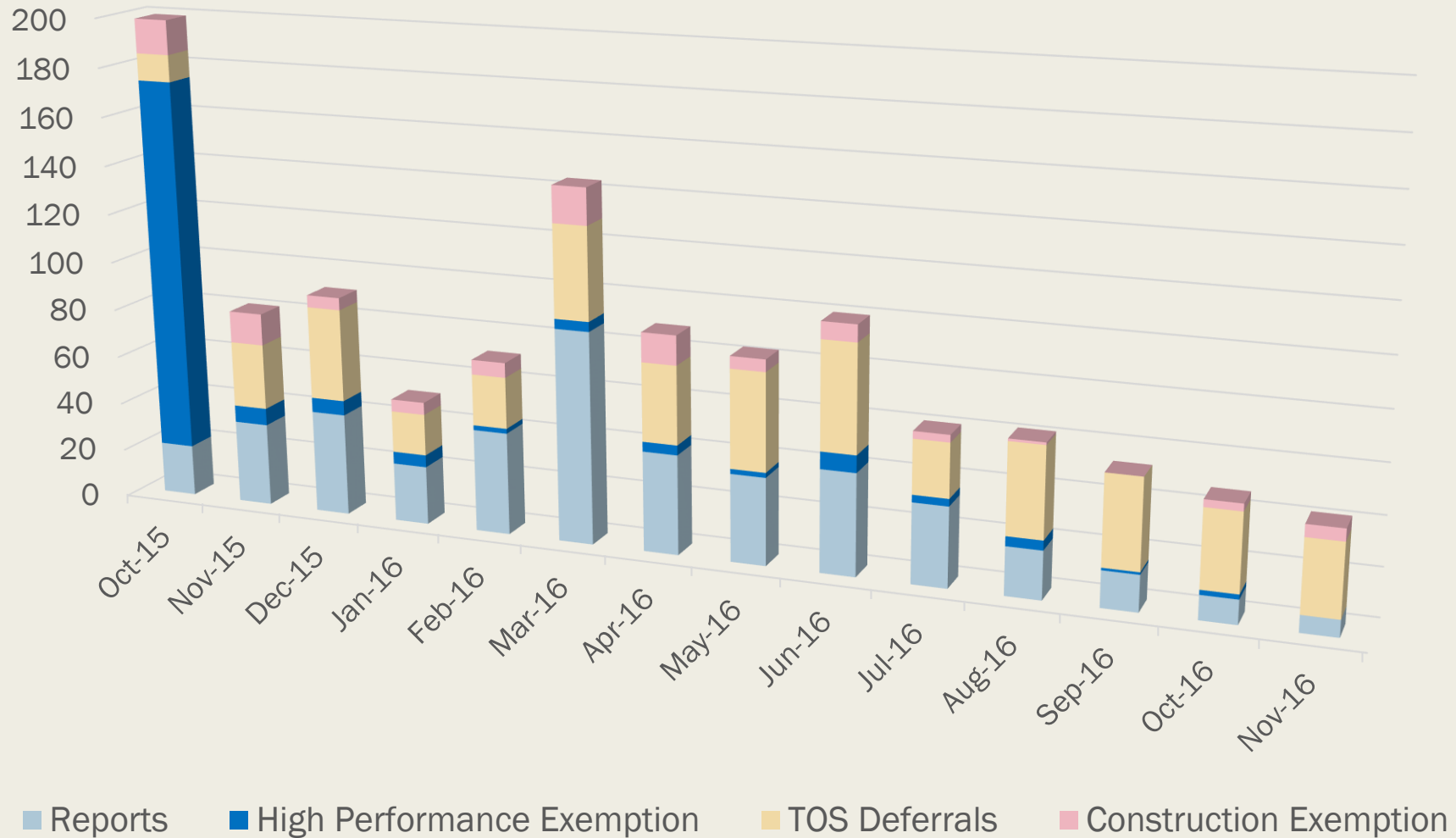
- 615 buildings are fully compliant
 - *191 buildings qualify as high performance*
- 393 buildings have one-year deferrals

Breakdown of Compliance Types



Time of Sale Trends

Monthly transactions by form type



Compliance to Date

- Four separate warnings are given before a citation is issued
 - *Courtesy Letter: Compliance Past Due*
 - *Violation Warning*
 - *Notice of Violation*
 - *Citation Warning*
- 14% of buildings receive at least one letter
- 57% comply after courtesy letter; 99% after Notice of Violation
- 5 buildings pending citations
 - *Citation fee of \$200, accrues monthly to max of \$800*

The Home Energy Score

HES Basics

- DoE tool created to allow comparison of estimated energy use between homes—like mpg for houses.
- What does the score mean? Each score is a bin for a given weather-normalized energy use compared to a national average
- Will soon incorporate solar—homes w/solar will get 2 scores, one without and one with
- Use our blurb

HES Cover

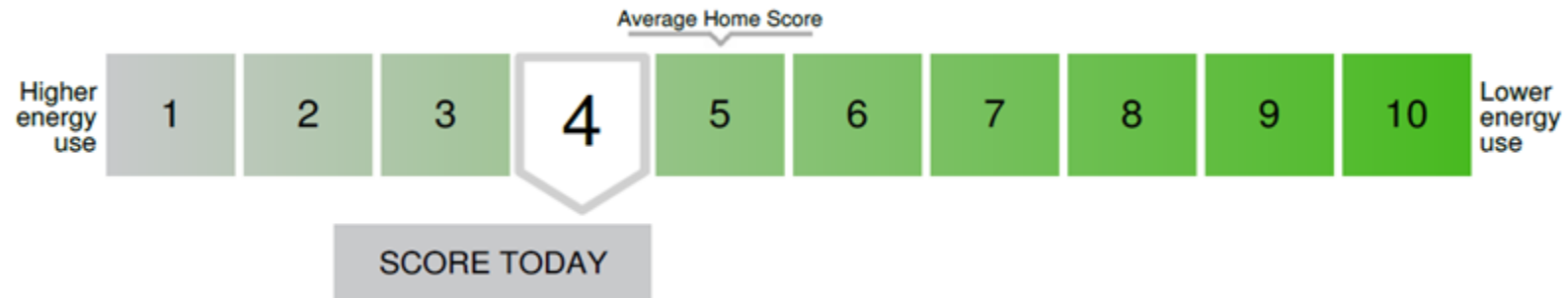


Home Energy Score

YEAR BUILT: 1970
CONDITIONED FLOOR AREA: 1450 FT²

2120 Milvia Street
Berkeley, CA 94704

SCORE TODAY **4**



The U.S. Department of Energy's Home Energy Score assesses the energy efficiency of a home based on its structure, heating, cooling, and hot water systems. For more information visit HomeEnergyScore.gov.

Existing Conditions



Home Energy Score

2120 Milvia Street
Berkeley, CA 94704

SCORE
TODAY

4

Home Facts

The Home Energy Score's Home Facts includes details about the home's current structure, systems, and estimated energy use. For more information about how the score is calculated, visit our website at HomeEnergyScore.gov.

About This Home



ASSESSMENT

Type	Official
Assessor name	CA-SWST-0035
Scoring tool version	v2015

HOME CONSTRUCTION

Year built	1970
Number of bedrooms	3
Stories above ground level	1
Interior floor-to-ceiling height	8 ft
Conditioned floor area	1,182 ft ²
Direction faced by front of house	East
Air sealed?	No

Estimated Annual Energy Use



ENERGY BY TYPE

Total	119 MBtus
Score basis	62 MBtus
Electricity	5,573 kWh
Natural gas	564 therms

COST BASIS

Electricity	\$0.162 / kWh
Natural gas	\$0.992 / therm
Energy cost per square foot	\$1.24 / ft ²

DEFINITIONS & CONVERSIONS

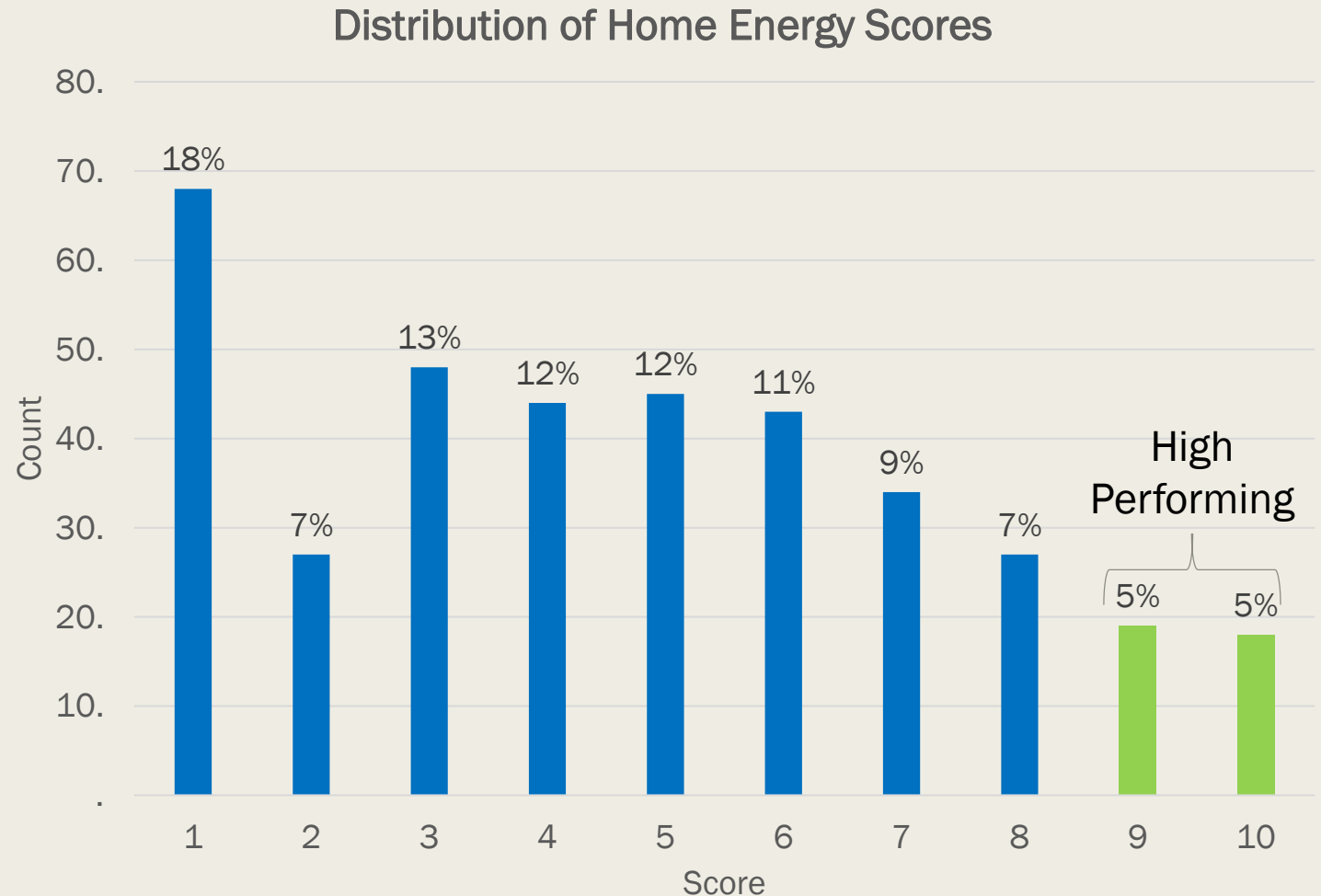
MBtu	Million British thermal units; generic energy unit
kBtu	Thousand British thermal units; generic energy unit
kWh	Kilowatt-hour; electricity unit
Therm	100,000 Btu; heat energy unit
Electricity conversion	1 MBTU = 293 kWh
Heat conversion	1 MBTU = 10 therms

Recommendations

	RECOMMENDED MEASURE	RECOMMENDATION DETAILS	GENERALLY RECOMMENDED IF
✓	Attic Insulation & Air Sealing	Insulation $\geq R-30$ ($\geq R-38$ in climate zones 1 & 11-16)	Existing average $\leq R-11$ and accessible attic exists
	Wall Insulation	Insulate $\geq R-13$	Existing =R-0
✓	Floor Insulation	Insulate $\geq R-19$	Existing =R-0 and accessible crawlspace exists
	Whole Building Air Sealing	$\geq 15\%$ leakage reduction from vintage table defaults	Homeowner experiences drafts
	Duct Repair	Repair may include sealing, insulating, or replacement. See Additional Comments for more information.	Visual inspection reveals duct leakage
✓	Central Gas Furnace	$\geq 92\%$ AFUE	Unit ≥ 15 years old and AFUE $\leq 80\%$
	Central Air Conditioner	≥ 15 SEER / 12.7 EER	Unit ≥ 15 years old and SEER ≤ 10
	Gas Storage Water Heater	EF ≥ 0.67	Natural gas unit ≥ 10 years old
	Gas On-Demand Water Heater	EF ≥ 0.82	Customer requests tankless
	Natural Gas Wall Heater or Ductless Heat Pump	$\geq 70\%$ AFUE (wall heater) ≥ 8.5 HSPF / ≥ 15 SEER (heat pump)	Unit ≥ 15 years old
	Fireplace Door and/or Damper	Sealing fireplace	Not existing
	Pool Pump	Variable speed	Single speed

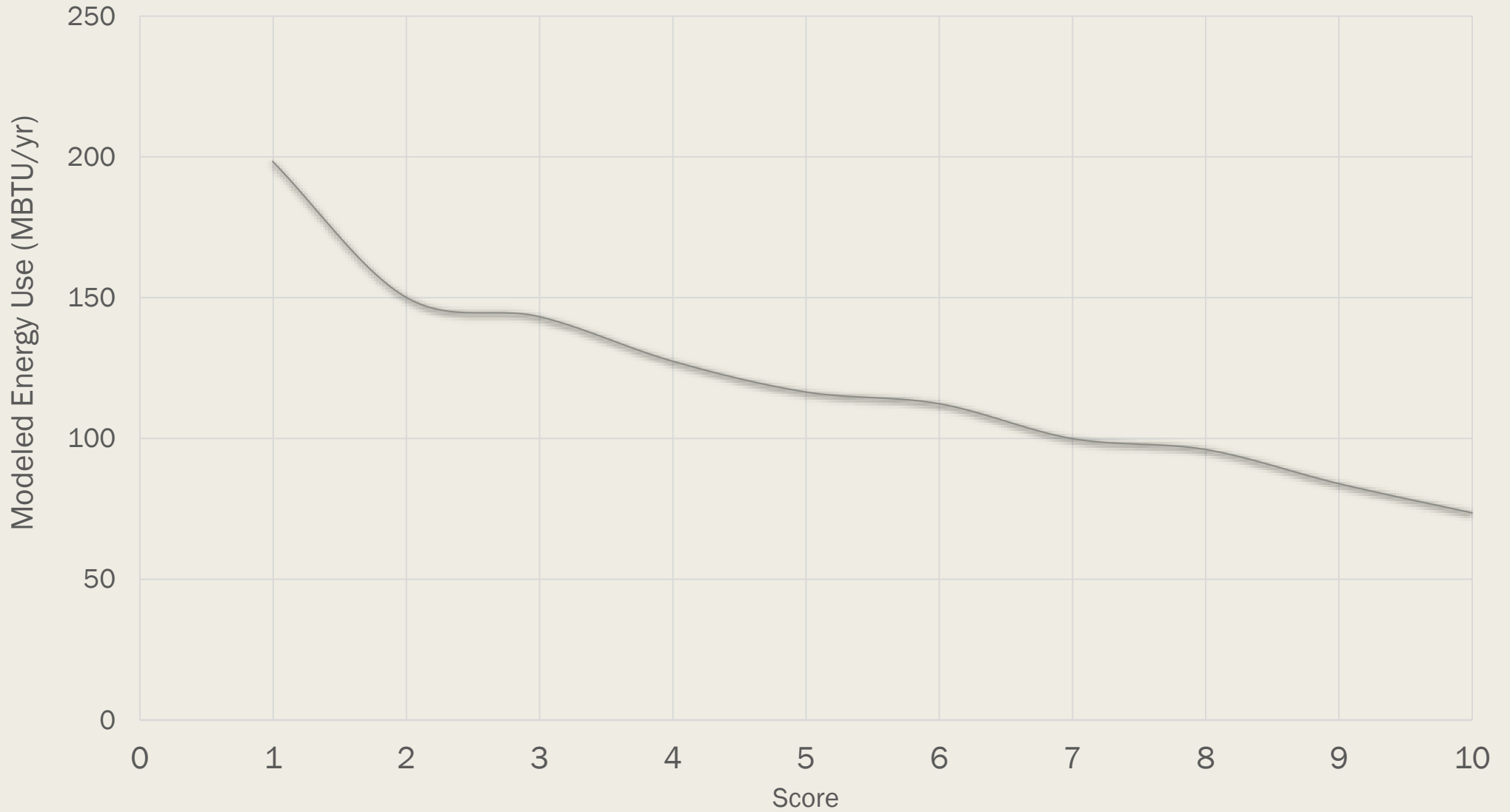
Home Energy Score Basics

- 376 assessments performed so far
- Average score 5
- 62% below 6; contacted by Upgrade Advisor
- UA contacted 66; 23 active or complete upgrades



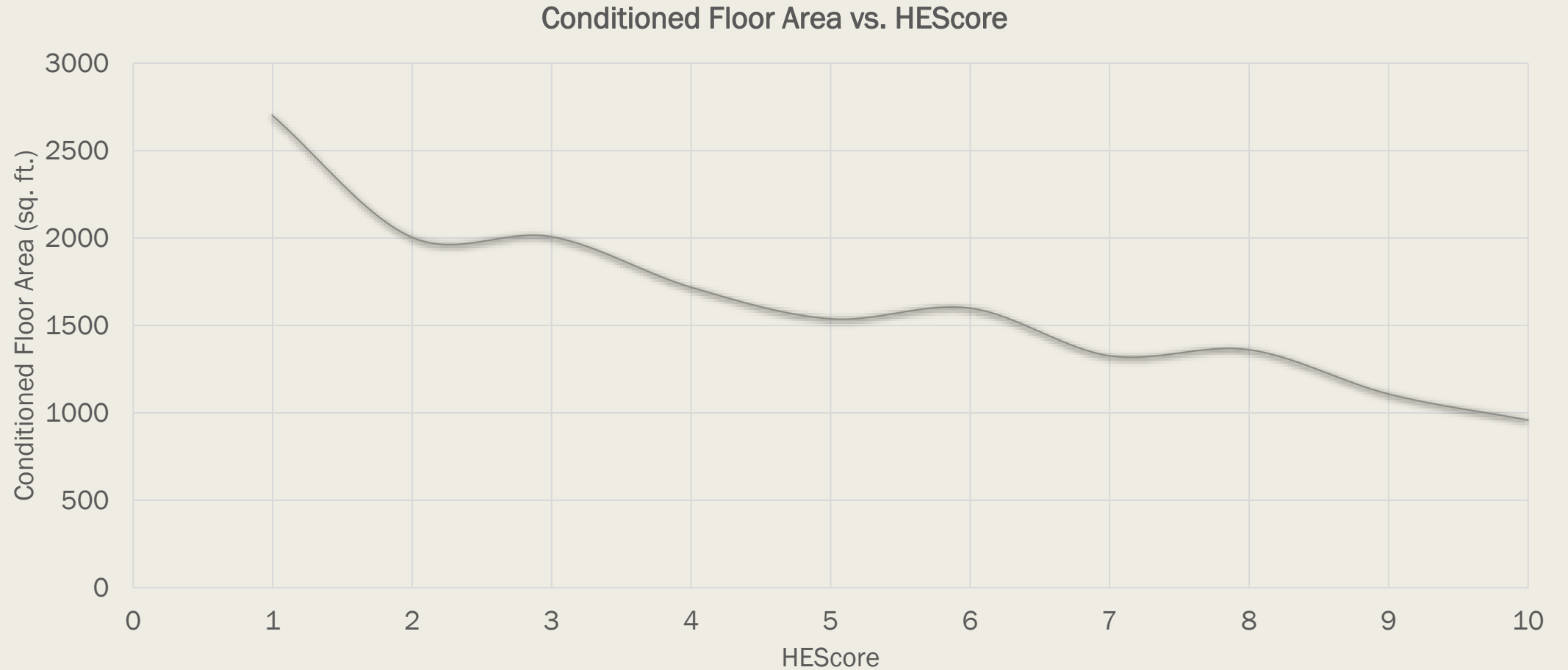
Home Energy Score Basics

Energy Use vs. HES



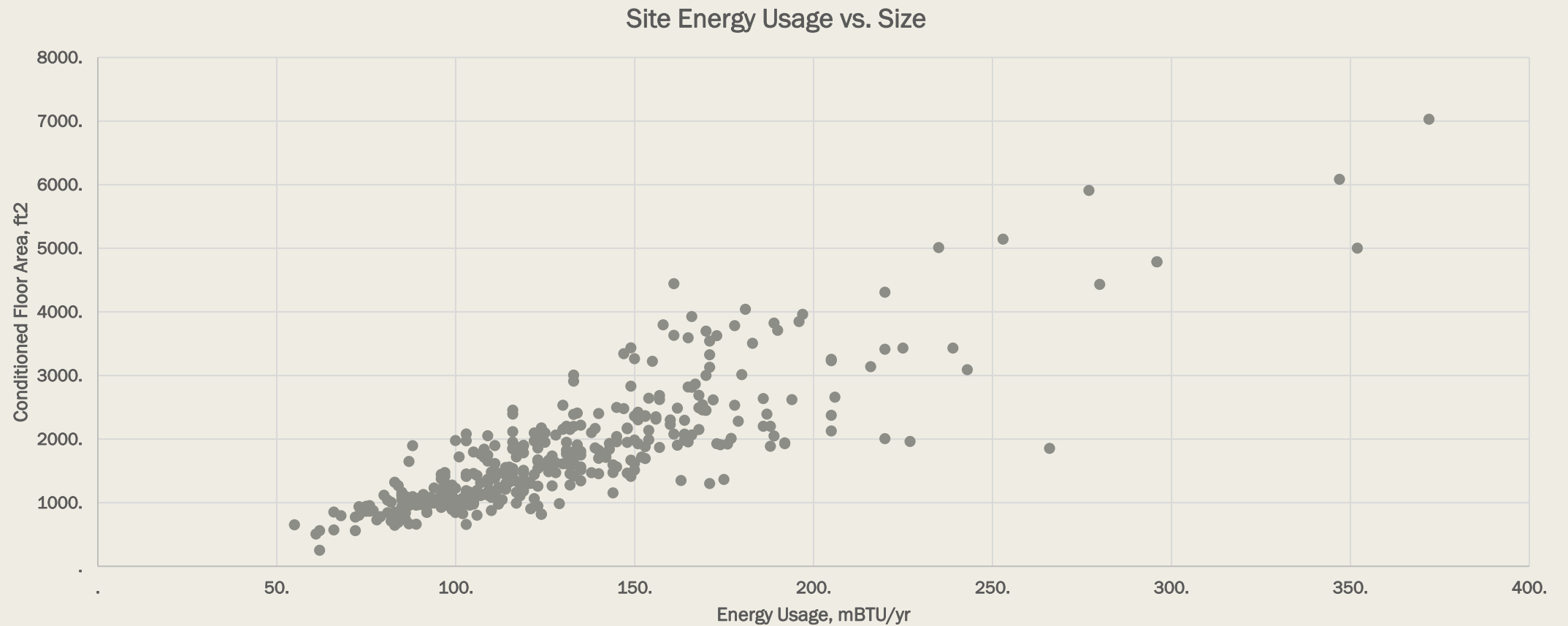
Data Analysis

- Smaller buildings score better



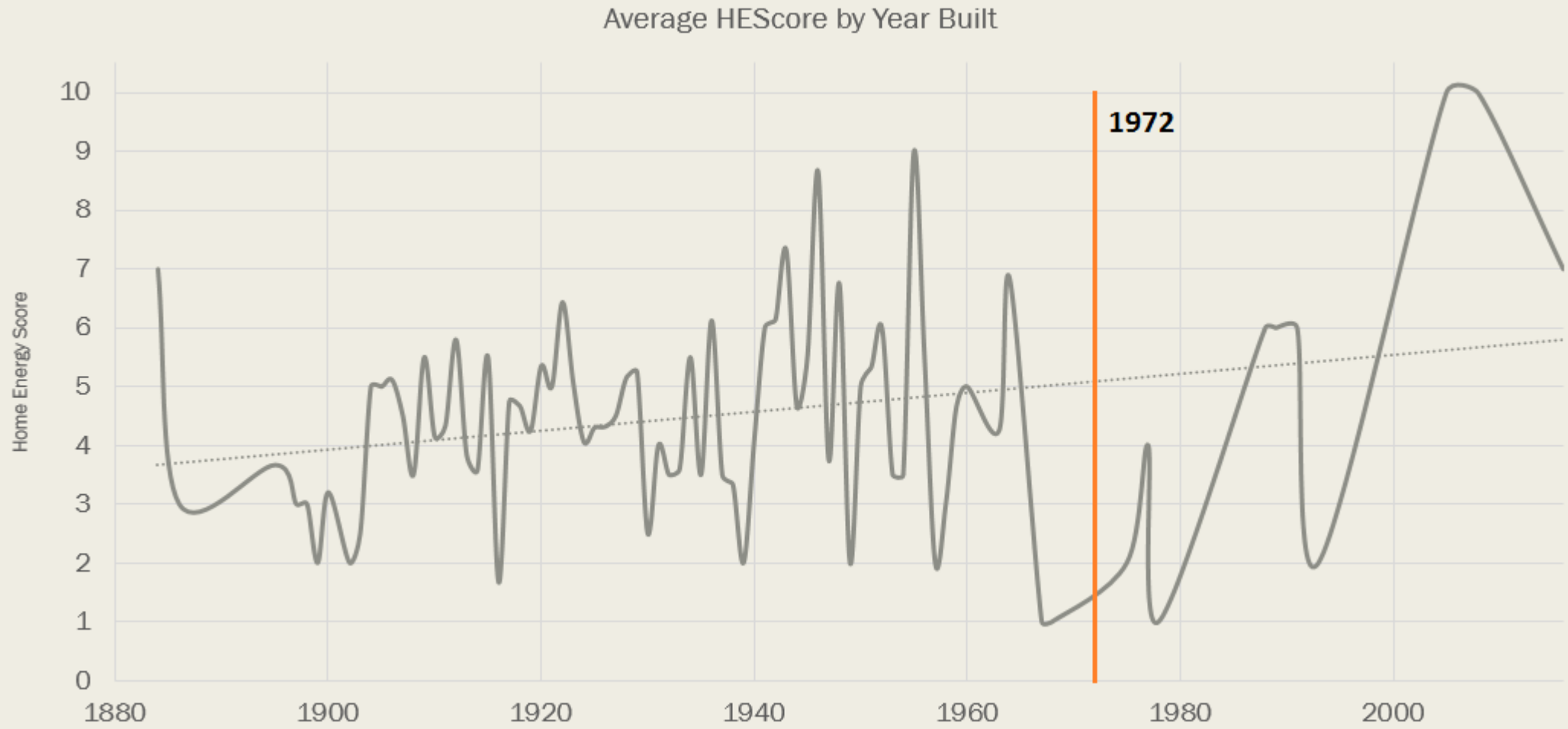
Data Analysis

- Smaller buildings use less energy



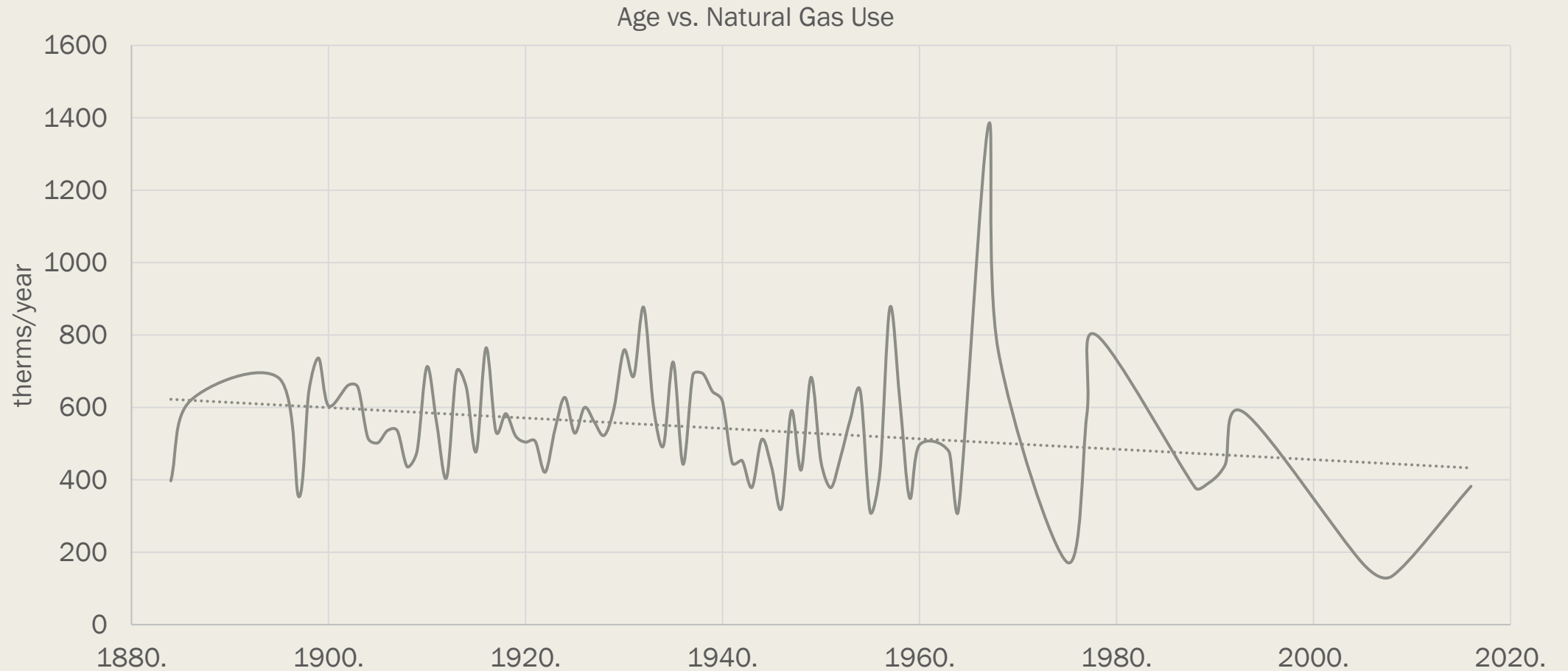
Data Analysis

- New buildings score slightly better on average



Data Analysis

- Newer buildings use less natural gas.

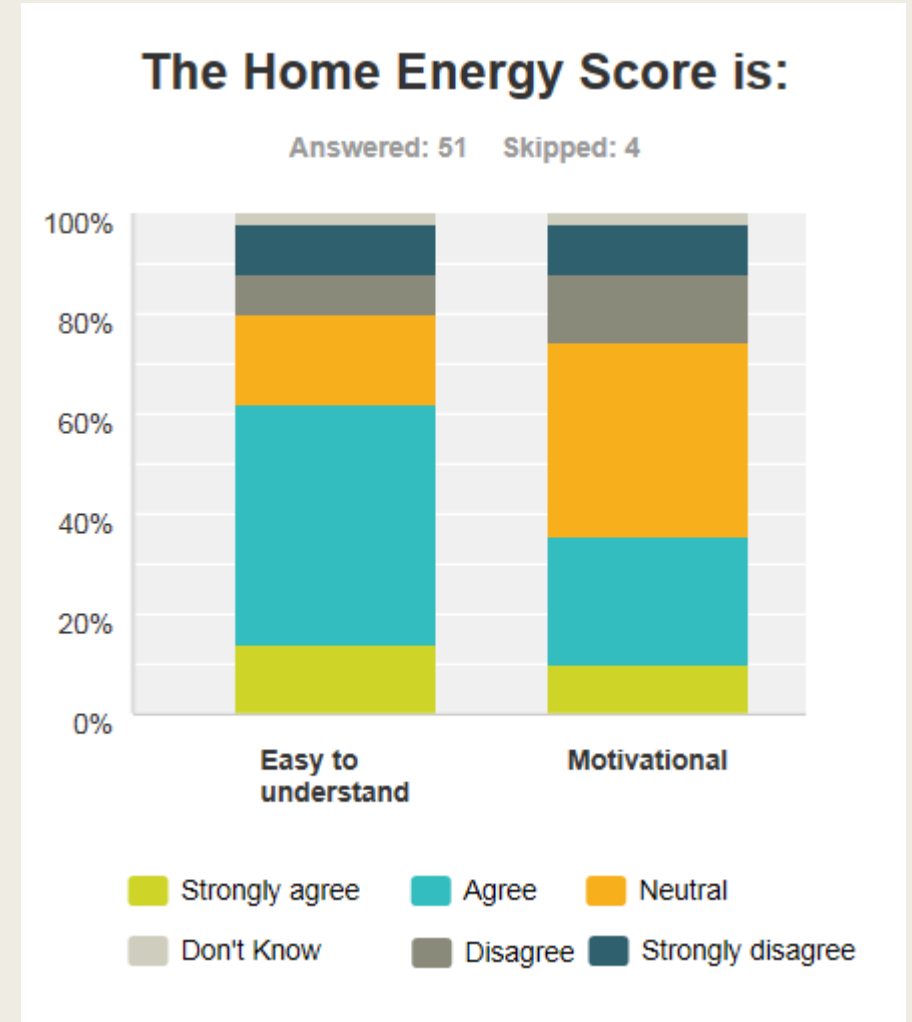


Building Stock

- Very few buildings assessed have insulation up to code
- Majority have no insulation at all
 - *90% have no roof insulation*
 - *83% have no floor insulation*
 - *50% have no wall insulation*
- Priority area for outreach & incentives; will change when buildings are renovated and brought up to 2016 Energy Code

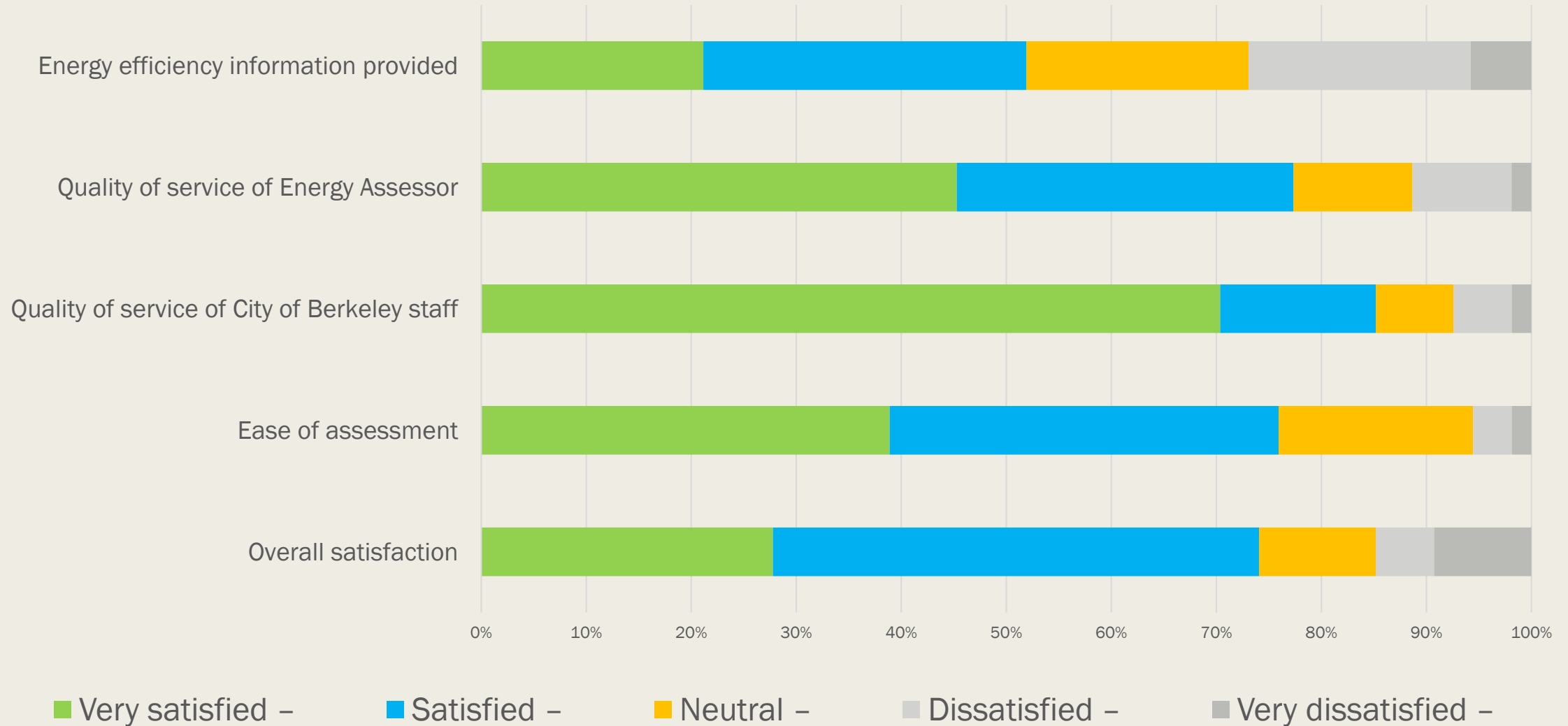
Feedback

- 62% find HES easy to understand
- 35% find it motivational
 - *Priority area: how to motivate residents?*



Feedback

Please rate your experience based on the following:



Questions?