



Opinion **Dynamics**

AMEREN ILLINOIS SMART THERMOSTAT CUSTOMER PREFERENCE STUDY

Detailed Results

FINAL



October 11, 2019





Agenda

- Introductions
- Study objectives
- Study methodology
- Detailed findings
 - State of the thermostat market
 - Customer behaviors
 - Customer thermostat preferences
 - Customer segmentation
- Conclusions and implications
- Additional survey results, segment profiles, and appendix



INTRODUCTIONS



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The Project Team

Tami Buhr



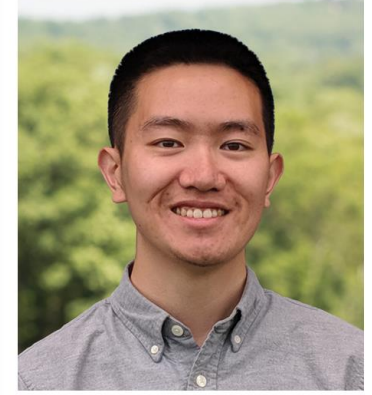
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STUDY OBJECTIVES



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Study Objectives

- Assess current state of the thermostat market
- Understand thermostat replacement behaviors
- Understand customer temperature preferences and thermostat operation behaviors
- Understand customer thermostat preferences and the effect of various thermostat attributes on consumer purchase decisions
- Capture market shares, awareness, use, and preferences for other technologies of program interest
- Ameren Illinois program awareness and participation

STUDY METHODOLOGY



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Data Collection Approach

- Quantitative general population survey
- Quantitative participant survey

Data Collection Approach – Quantitative General Population Survey

Target Population

- Ameren Illinois residential customers



Survey Mode

- Web with available inbound phone
- Discrete choice module on web survey only



Survey Outreach

- Mailed postcard invitations and reminders to 3,763 customers
- Offered incentives up to \$15 to encourage participation



Survey Administration

- Fielded in January 2019
- 496 customers completed



Demographic Weights

- Post-stratification weights help ensure representativeness of results
- Weighted results by home ownership and age



Data Collection Approach – Quantitative Participant Survey

Target Population

- Ameren Illinois Retail Products Initiative participants



Survey Mode

- Web survey with discrete choice module



Survey Outreach

- Emailed invitations and reminders to 6,657 participants



Survey Administration

- Fielded in January 2019
- 1,490 participants completed



Discrete Choice Shopping Exercise Design

- Aims to replicate thermostat shopping experience
- Comprehensive set of product attributes and levels
 - 5 products per choice set
 - 12 choice sets per respondent

Sample Choice Set from Shopping Exercise:

						
Price	\$25	\$225	\$185	\$105	\$25	
Energy bill savings	Up to \$150/yr	Up to \$50/yr	Up to \$200/yr	Up to \$100/yr	Up to \$50/yr	
Installation cost	DIY/free self-install	+\$100 professional	+\$150 professional	+\$100 professional	DIY/free self-install	
Programmable	✓	✓	✓	✓	✗	
Home sensing	✗	✓	✗	✗	✗	
Learning feature	✗	✓	✗	✓	✗	
Remote access	✗	✓	✗	✓	✗	
Voice command	✓	✗	✗	✓	✗	
Occupancy sensing	✗	✓	✗	✓	✗	
						
	Select	Select	Select	Select	Select	NONE: I wouldn't choose any of these.

General Population Survey Analysis

- Thermostat Discrete Choice
 - Latent class modeling to quantify preferences and define segments
 - Relative importance of thermostat attributes to customers
 - Price elasticity for smart thermostats
 - Shares of preference simulations under various conditions
 - Characterization of latent class segments
- Descriptive statistics for non-discrete choice survey data analysis (frequency distributions, measures of central tendency, etc.)

DETAILED FINDINGS



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Definitions



Manual

Allows the user to set the temperature and adjust it up or down as desired by manually turning a dial or moving a lever; the temperature setting only changes when the user adjusts the thermostat.



Programmable

Uses the built-in calendar and clock to adjust the temperature according to programmed settings by day and time but are not Wi-Fi-connected. These thermostats are also called “setback thermostats” or “clock thermostats”.



Smart

In addition to doing everything a programmable thermostat does, these thermostats connect to the Internet and allow the user to adjust the temperature through smartphones or tablets. Some also automatically tailor settings based on occupant preferences, heating system type, home energy profile, and outdoor temperature.

State of the Thermostat Market



Key Findings



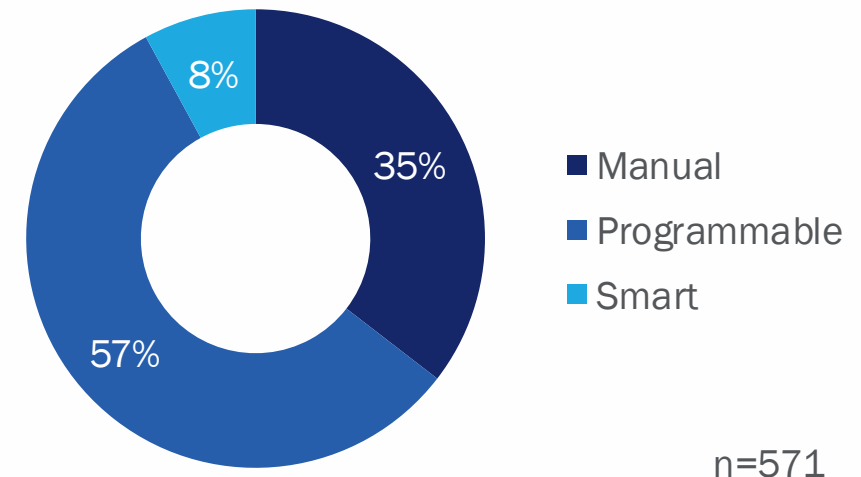
- Smart thermostats are relatively uncommon and represent 8% of all thermostats in Ameren's service territory though their market share has increased dramatically over the past year
- Customers who currently have smart thermostats fit the profile of early adopters, particularly those who participated in the Retail Products Initiative
 - They are more tech-savvy, younger, more affluent, and have higher levels of educational attainment
- Customers who have replaced their thermostats over the past three years have taken varied journeys
 - Nearly two-thirds who replaced their thermostats did so because of a precipitating event – an HVAC upgrade, a thermostat failure, or a new addition to their home. These customers were more likely to install a programmable or manual thermostat, largely due to their reliance on contractors who recommended the device
 - Just over one-third upgraded a functioning thermostat and were slightly more likely to install a smart thermostat than a programmable one and very few customers chose a manual thermostat
- Reducing energy consumption is not a priority for smart thermostat owners. In fact, they are less likely than other customers to be concerned with reducing their energy use

Smart Thermostat Market Saturation

- Programmable thermostats are the most commonly used thermostat type in customer homes
- Smart thermostats represent 8% of all thermostats
- On average, there are 1.19 thermostats per home
- 1.2 million thermostats are available for replacement*
 - 23% of households do not have Internet capabilities to take advantage of all smart thermostat features
 - 955,000 Wi-Fi enabled smart thermostat potential

**Removes households that do not have a thermostat (1%)*

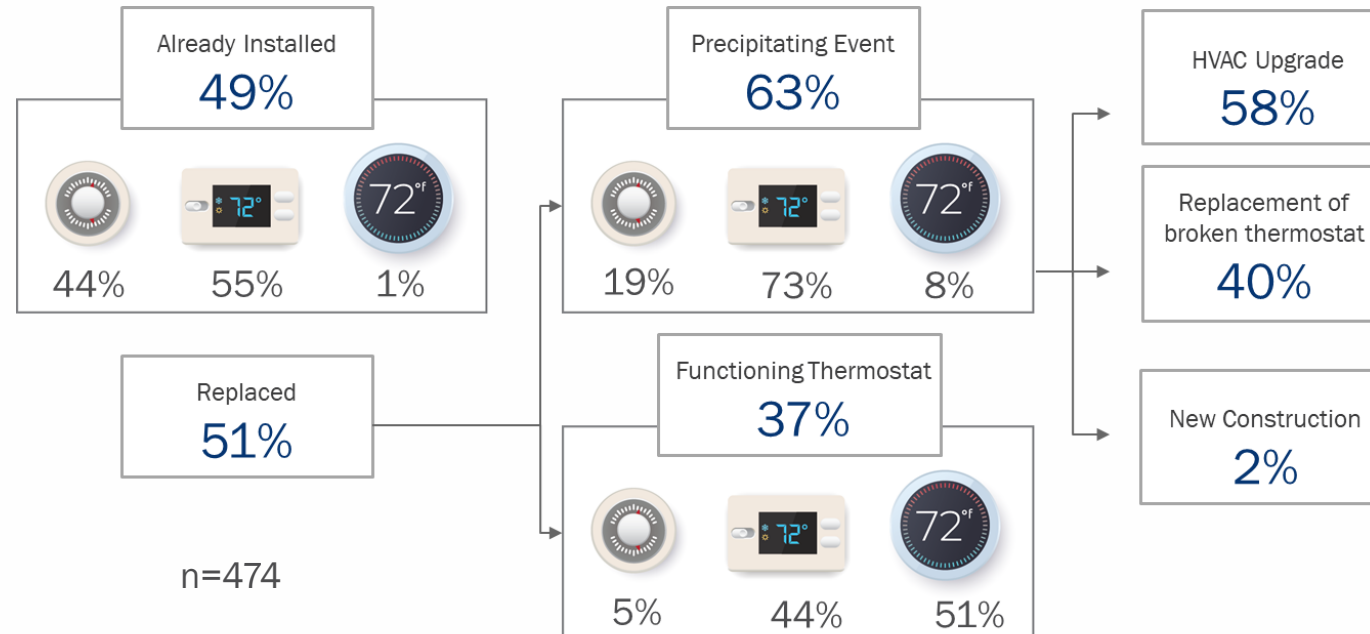
Distribution of Thermostat by Type



Number of Thermostats in an
Average Home
1.19

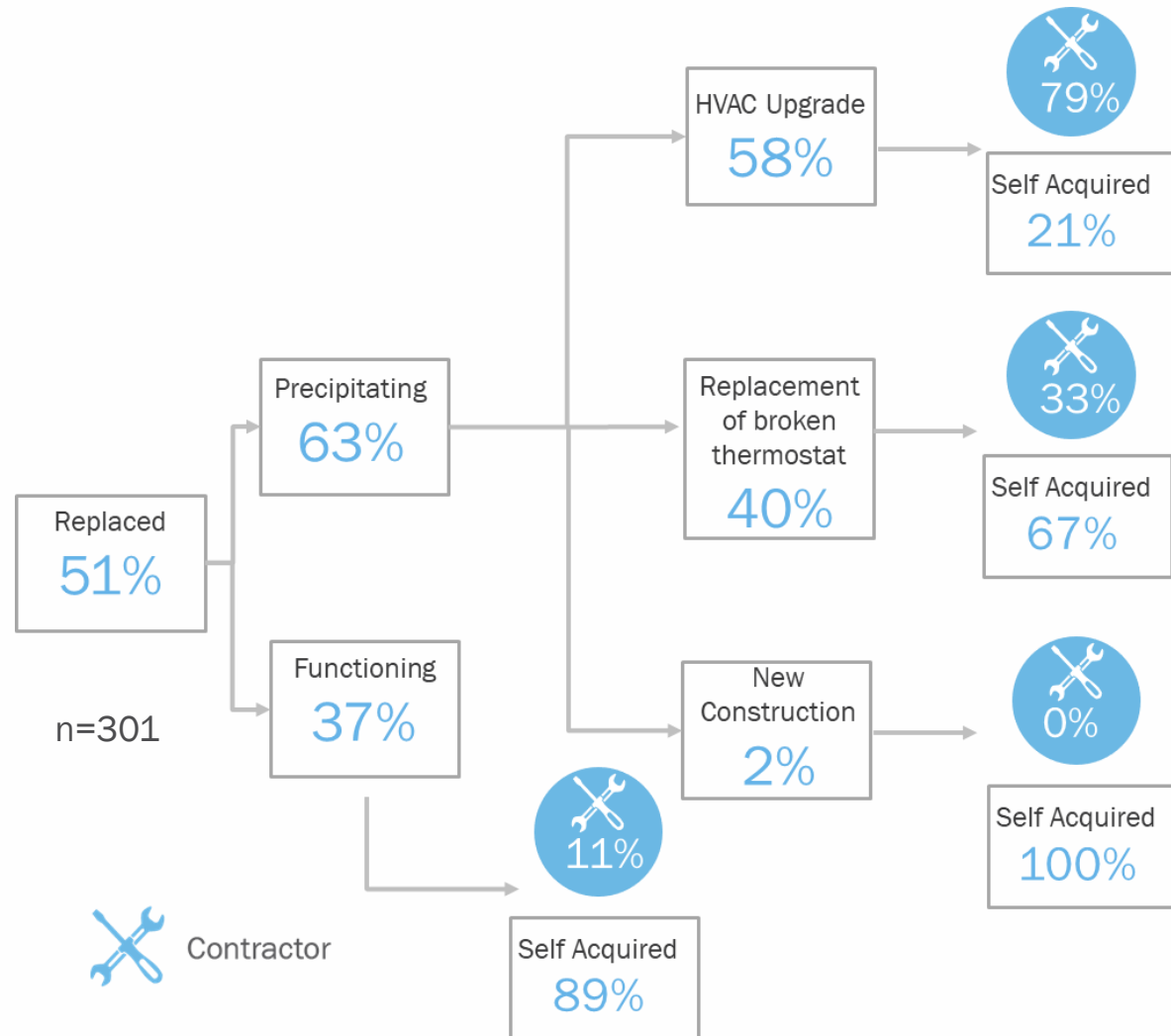
Thermostat Replacement Journey

- Just under half of customers have thermostats that were already installed in their homes when they moved in, while the remaining customers replaced their thermostats since moving into their current home
- Only 1% of customers moved into a home that had a smart thermostat installed
- Close to two-thirds of customers who replaced their thermostats did so because of a precipitating event – an HVAC upgrade, thermostat failure, new addition to their home, while just over one-third did so to upgrade a functioning thermostat
- Customers who install thermostats due to a precipitating event are much more likely to install a programmable thermostat whereas customers who upgrade their existing thermostat are slightly more likely to install a smart thermostat



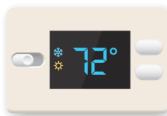
Thermostat Replacement Customer Journey (cont.)

- Contractors play an important role in the selection of thermostats, particularly as part of an HVAC system upgrade



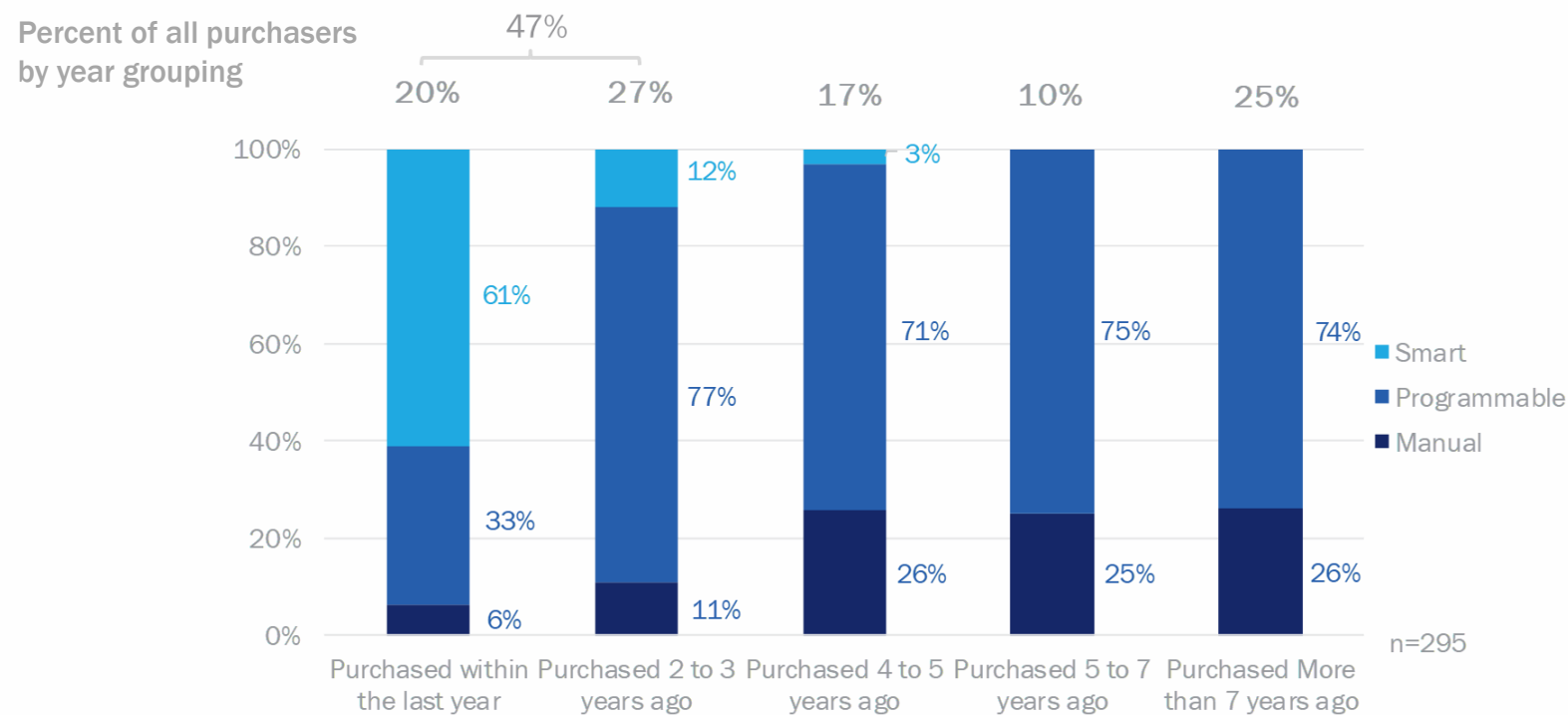
Thermostat Replacement Customer Journey (cont.)

- Contractors are more likely to install programmable and manual thermostats than smart thermostats
- Customers select programmable thermostats followed by smart thermostats

	Contractor Selected	Customer Selected
	20%	9%
	69%	66%
	11%	25%
	n=72	n=81

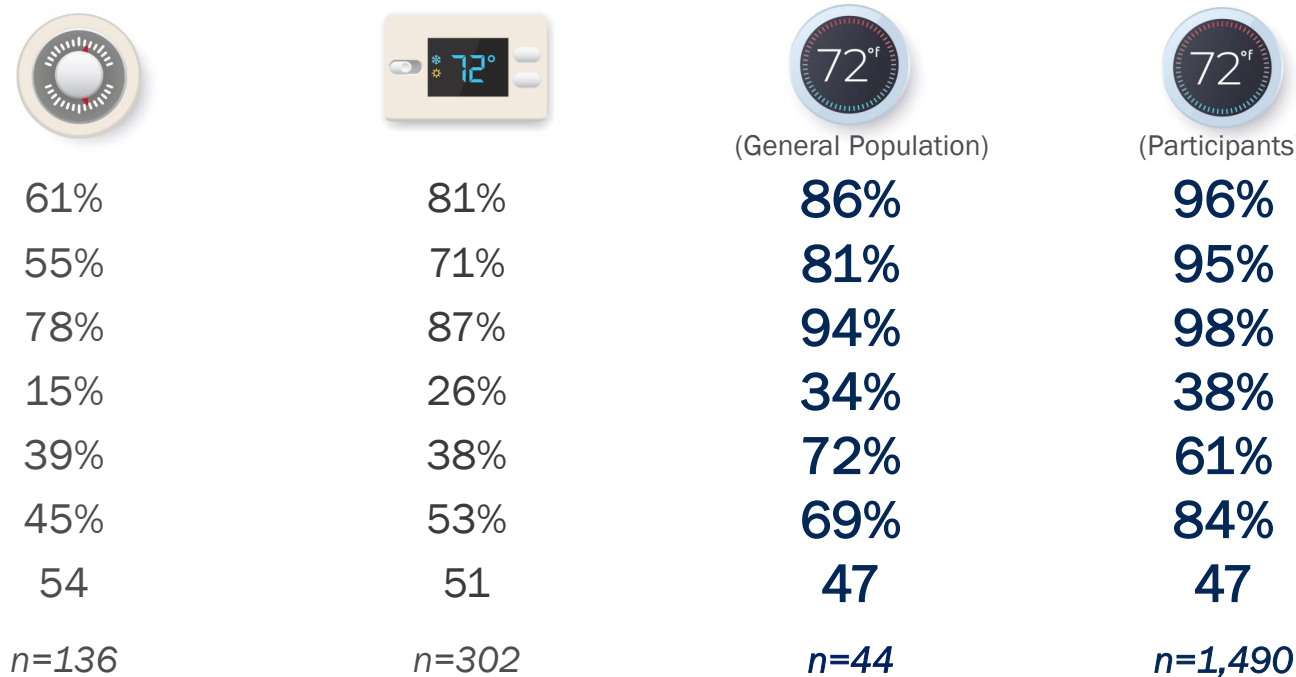
Thermostat Replacement Trends

- The market share for smart thermostats is increasing dramatically over the past year
 - 61% of customers who replaced their thermostats in 2018 installed a smart thermostat, compared to just 12% of those who replaced their thermostats between 2016 and 2017
- Nearly half of customers who have replaced their thermostats did so between 2016 and 2019



Sociodemographic Characteristics of Thermostat Owners

- Compared to manual and programmable thermostat owners, smart thermostat owners are more likely to be younger, more affluent, have higher levels of educational attainment, reside in single-family homes, have bigger homes, and own their homes
- These characteristics are even more pronounced among smart thermostat owners who participated in the Retail Products Initiative and are consistent with early adopters



Attitudinal Characteristics of Thermostat Owners

- Smart thermostat owners are...
 - much more tech-savvy than manual or programmable thermostat owners
 - slightly more concerned with managing energy use than owners of manual thermostats
- Retail Products Initiative participants' tech savviness score is higher than that of the general population of smart thermostat owners



Tech savviness score (1=low, 7=high)*

3.30

3.41

(General Population)
4.01

(Participants)
4.50

Engagement in Energy Use

Not concerned

25%

20%

13%

12%

Idealists (engaged but not proactive)

31%

43%

50%

47%

Achievers (engaged and proactive)

44%

38%

37%

41%

n=136

n=302

n=44

n=1,490

Customer Behaviors



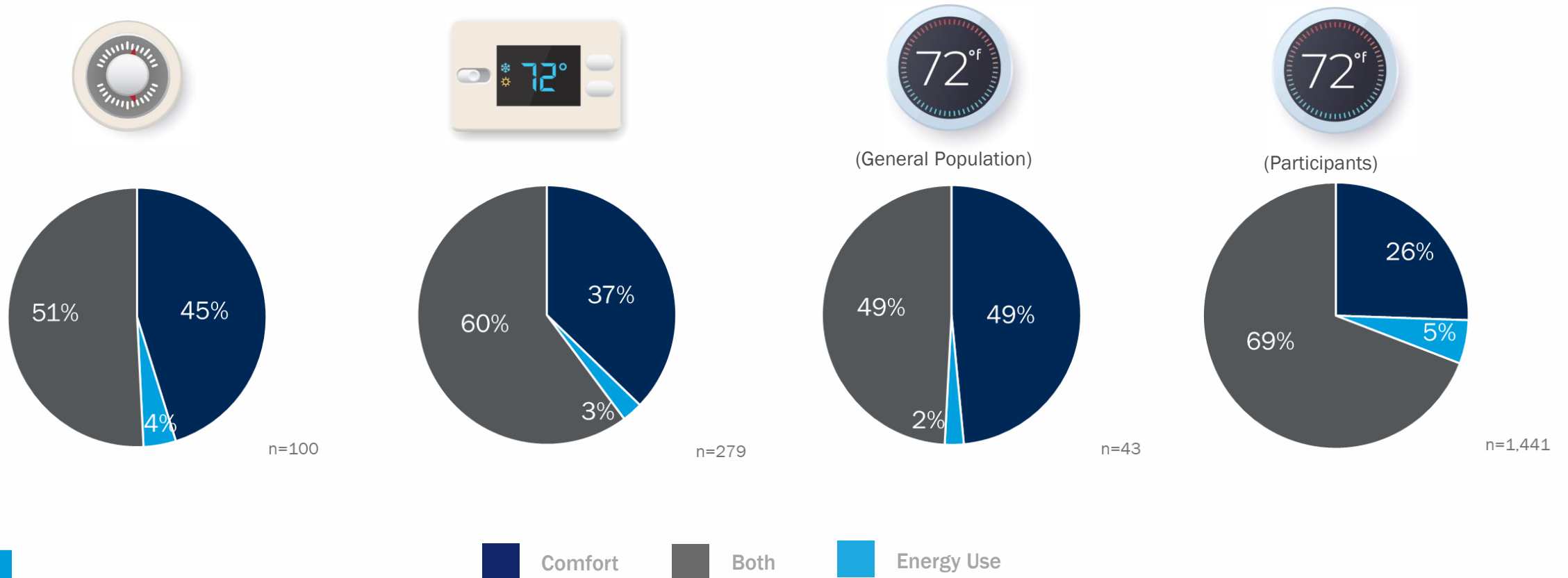
Key Findings



- Comfort is the primary driver behind thermostat setpoints
- While many smart thermostat owners leverage programmed schedules and away/vacation functionalities of their devices, many continue using smart thermostats like they would use manual thermostats
- Furthermore, even when programmed, smart thermostat owners continually make manual adjustments to temperature settings on their devices

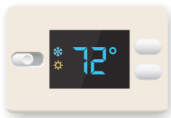
Key Drivers of Setpoint Behaviors

- Users of all thermostat types prioritize comfort followed by energy savings when selecting thermostat setpoints
- Retail Products Initiative participants, however, value a balance of comfort and energy use



Typical Temperature Control Behaviors

- Smart thermostat owners are more likely to program their thermostats on a schedule than to make manual adjustments or set their thermostat to a single temperature setting
- Still, approximately one-third continue to use their smart thermostat as a manual one, making manual adjustments or setting a single temperature for the season

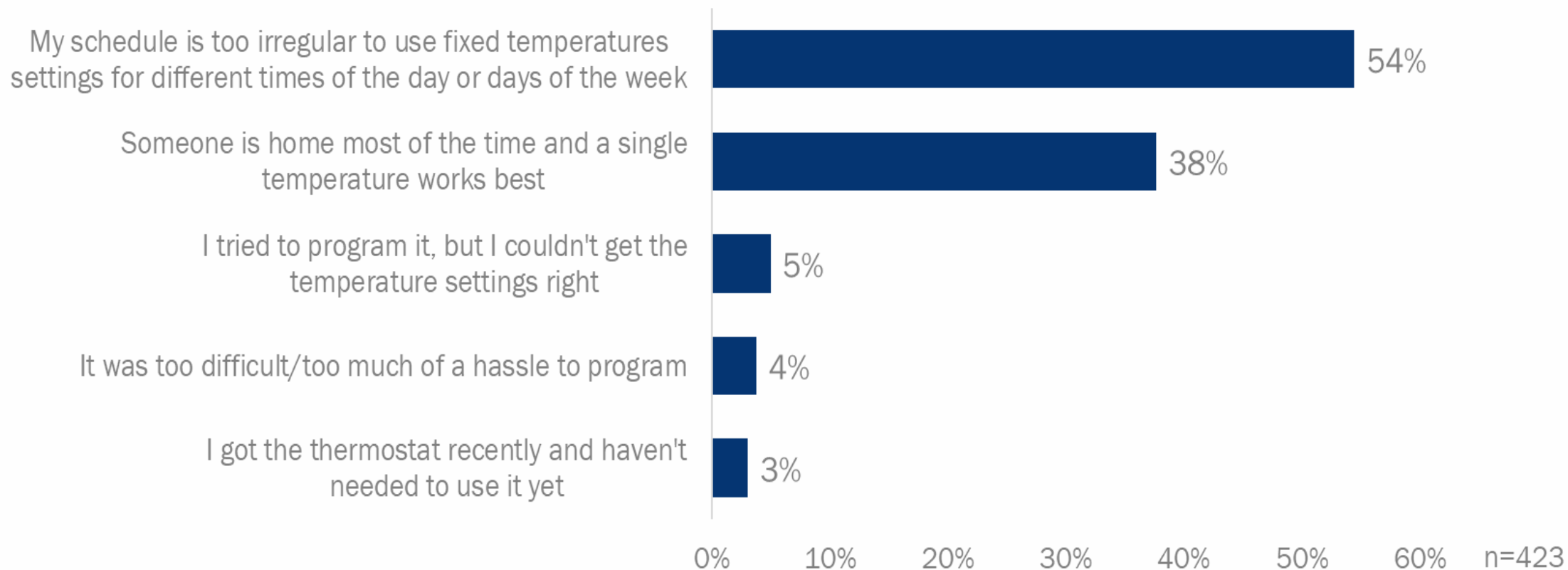


(General Population)

(Participants)

Programmed temperature schedule	0%	27%	62%	63%
Manually adjusted temperature settings	65%	53%	27%	24%
Set a single temperature for the season	35%	20%	11%	8%
	(n=97)	(n=281)	(n=41)	(n=1,429)

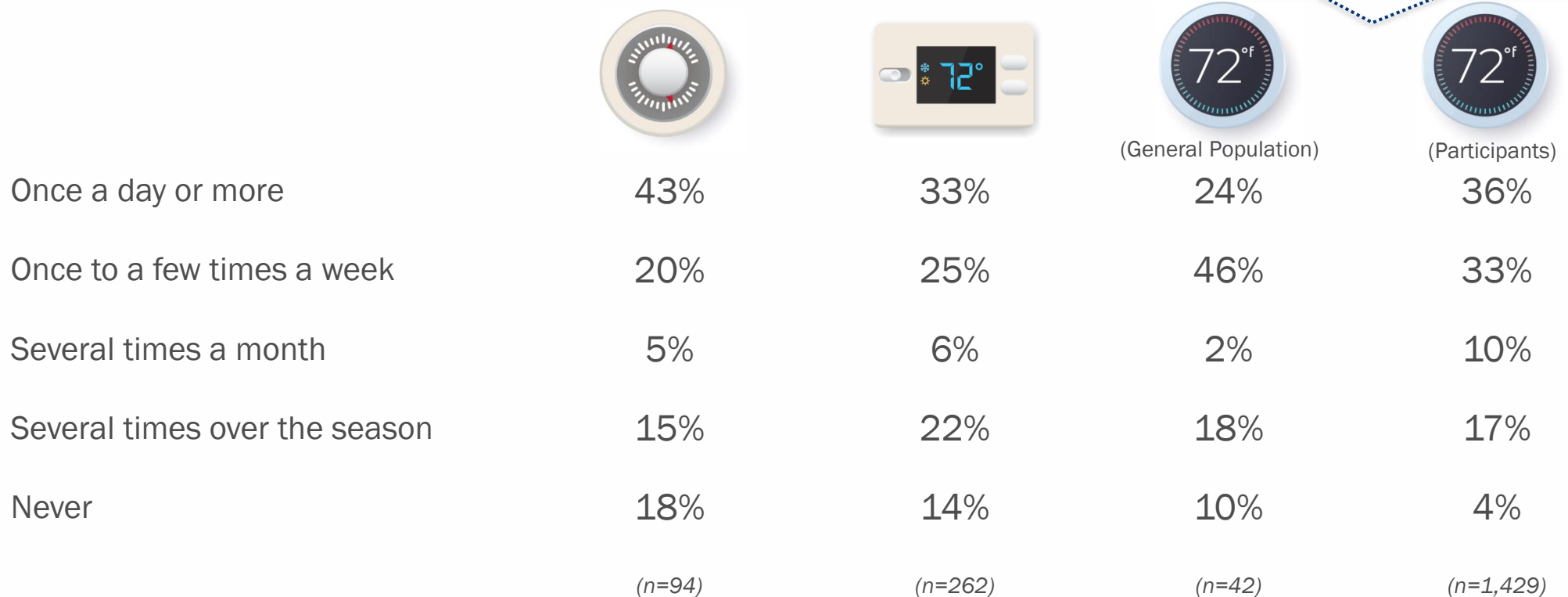
Participant Reasons for Not Using a Programmed Schedule



Frequency of Thermostat Adjustments When Home

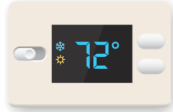
- Most customers make manual adjustments to thermostat settings, with about half doing so at least once a day and over two-thirds doing so at least once a week

Most smart thermostat owners (89% of general population and 96% of participants) have adjusted temperature remotely. Of those, 47% do so at least a few times a week.



Use of Thermostats When Away or on Vacation

- While away or on vacation, less than half of smart thermostat owners use the away or vacation mode function
- Users of other types of thermostats make use of other energy-saving adjustments

			 (General Population)
Turned off air conditioning system	33%	19%	17%
Set thermostat to higher temperature	58%	66%	38%
Set thermostat to away/vacation mode	9%	5%	41%
Left thermostat on usual setting	0%	10%	4%
	(n=79)	(n=217)	(n=33)





Customer Thermostat Preferences



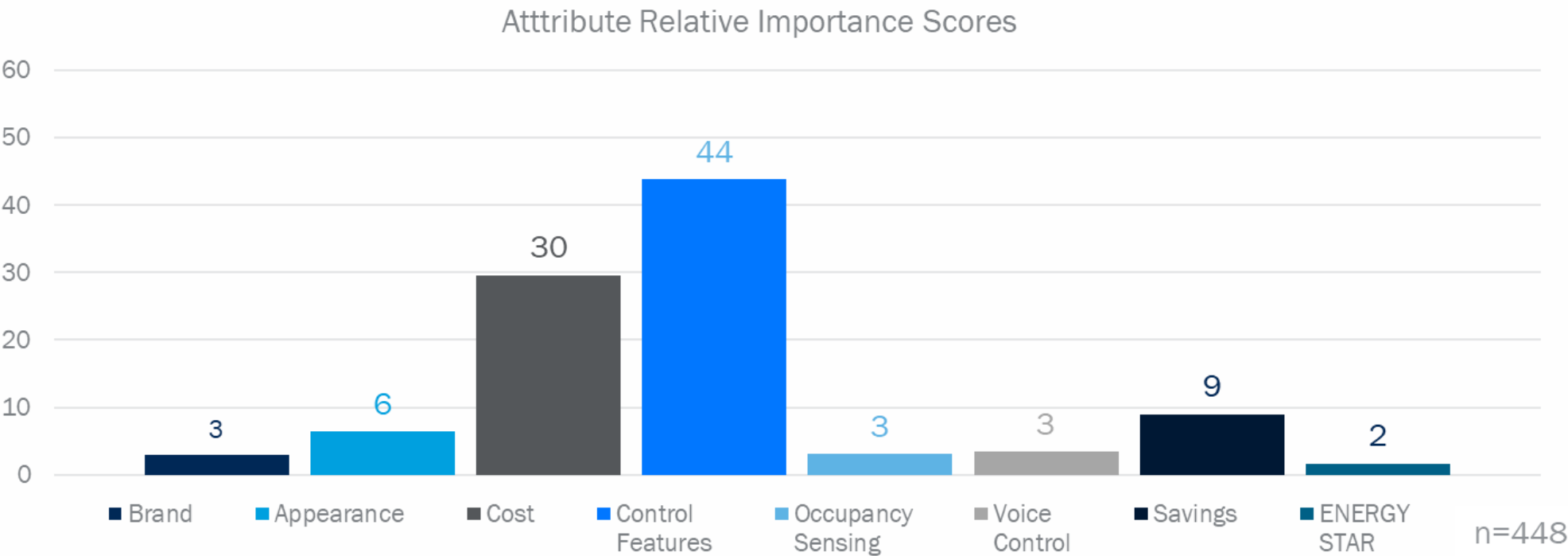
Key Findings



- Most customers like the features of smart thermostats and would be willing to purchase one if they had to replace their thermostat
- Thermostats have long lifespans and do not require frequent replacement. Customers will need to be encouraged to replace their older functioning thermostats
- Customer preferences are relatively price *inelastic*. Thermostat control features, rather than price, drive thermostat preferences, suggesting that discounts and incentives may have less value in encouraging adoption
- The main barrier to customers purchasing smart thermostats appears to be motivating them to replace a working thermostat

Thermostat Attribute Relative Importance

- When shopping for a thermostat, customers prioritize control features followed by cost
- Energy savings is a lower priority

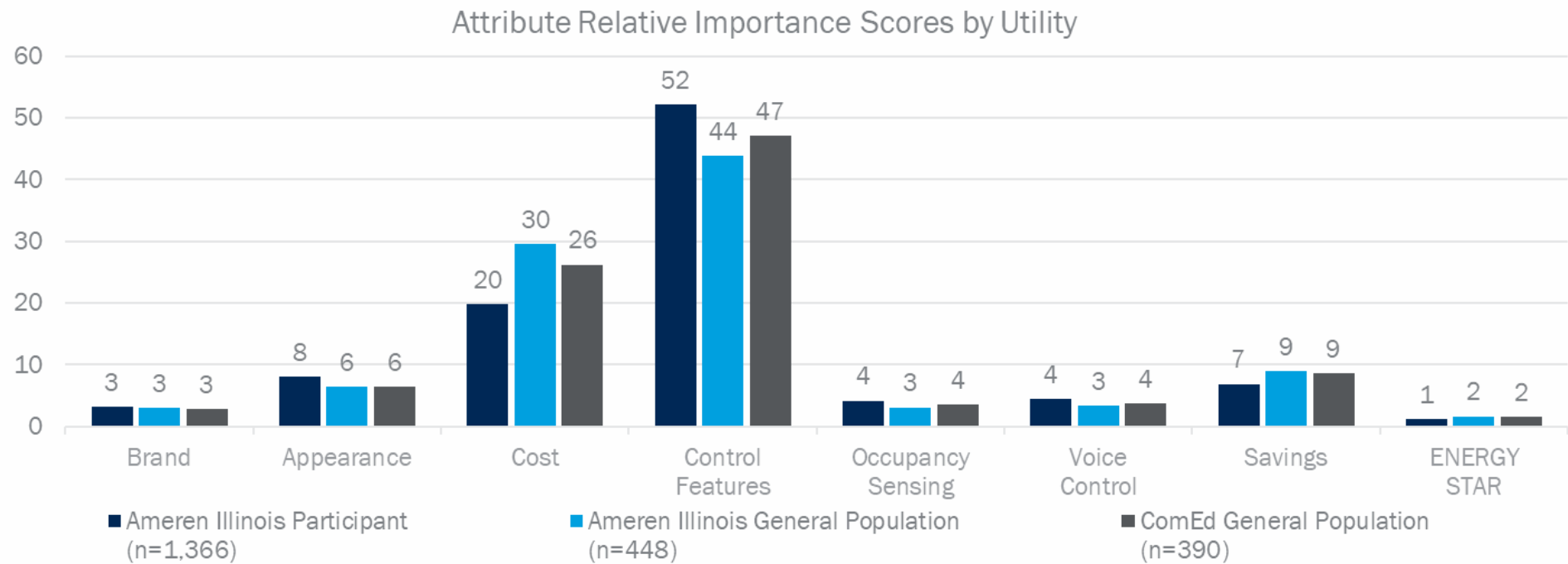


¹ Includes both price and installation cost

² Captures whether thermostat is manual, programmable, or home sensing/learning

Thermostat Attribute Relative Importance by Utility

- Ameren Illinois and ComEd customers show similar thermostat preferences
 - Ameren Illinois customers tend to be slightly more price sensitive
 - Ameren Illinois customers place slightly less emphasis on control features
- Ameren Illinois Retail Products Initiative participants are less cost-sensitive and place more emphasis on control features

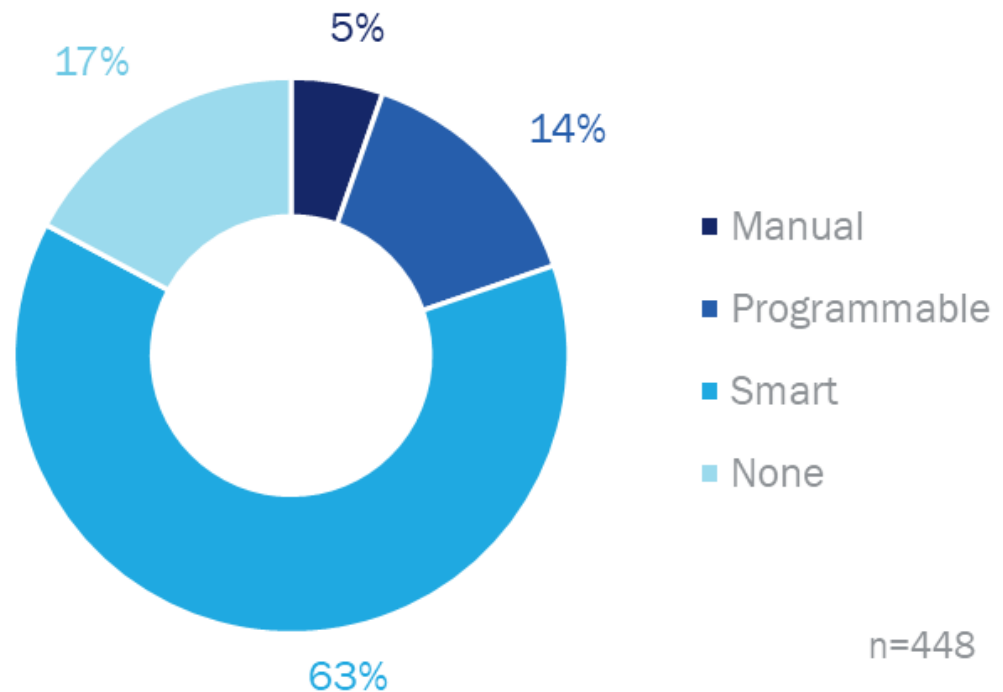


¹ Includes both price and installation cost
² Captures whether thermostat is manual, programmable, or home sensing/learning

Share of Preference Under Current Conditions

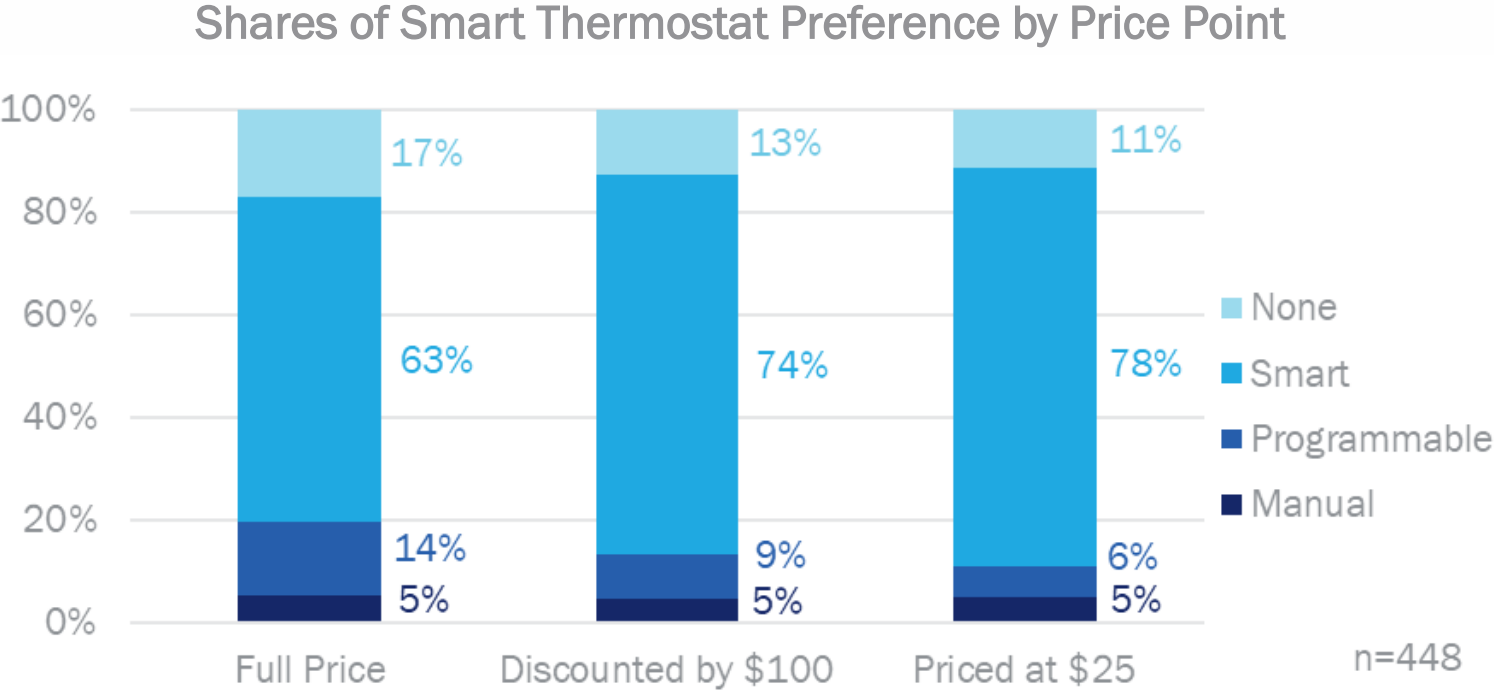
- If shopping for a new thermostat...
 - Nearly two-thirds of customers would select a smart thermostat
 - Fewer would select a programmable or manual thermostat
 - Nearly one-fifth would not choose one of the options available and keep their current thermostat

General Population Shares of Preference Under Current Market Conditions



Share of Preference Under Different Price Scenarios

- Customer demand is relatively price inelastic
 - Discounting smart thermostats by \$100 increases their share of preference by 11 percentage points
 - A small and consistent share of customers will not purchase a thermostat or will select a manual thermostat regardless of smart thermostat price



Customer Segmentation

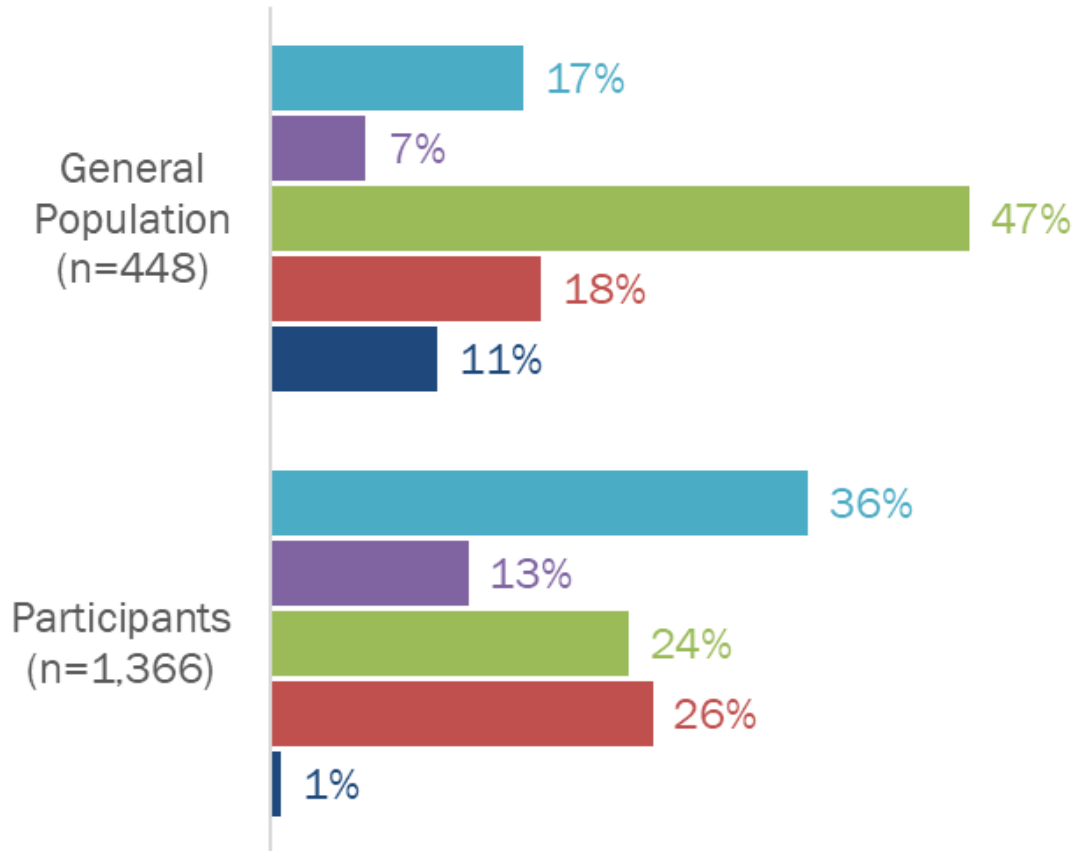


Key Findings



- LCDC modeling identified five customer segments based on the thermostat purchase preferences
- Each segment places emphasis differently on the various thermostat attributes, calling for customized marketing, messaging, and intervention approaches
- Segments differ based on demographic characteristics, attitudes, and behaviors
- Customers who have purchased smart thermostats through the Retail Products Initiative fit a different customer profile compared to the general population of Ameren Illinois customers with many falling into the segment that is most appreciative of the technological features of smart thermostats

Customer Segmentation – Summary



Tech Devotees

- Tech-savvy early adopters with strong preference for advanced control features
- Most likely to already own a smart thermostat and to buy at full price

Design at All Costs

- Willing to spend any amount for name brand and modern design
- Most would buy smart thermostats regardless of price
- Tech-savvy

Tech-Appreciating Savings Seekers

- Interest in at least some programmability with appreciation for added tech
- Open and willing to purchase smart thermostats, especially as the prices drop
- Most energy-conscious

Biggest Bang for the Buck

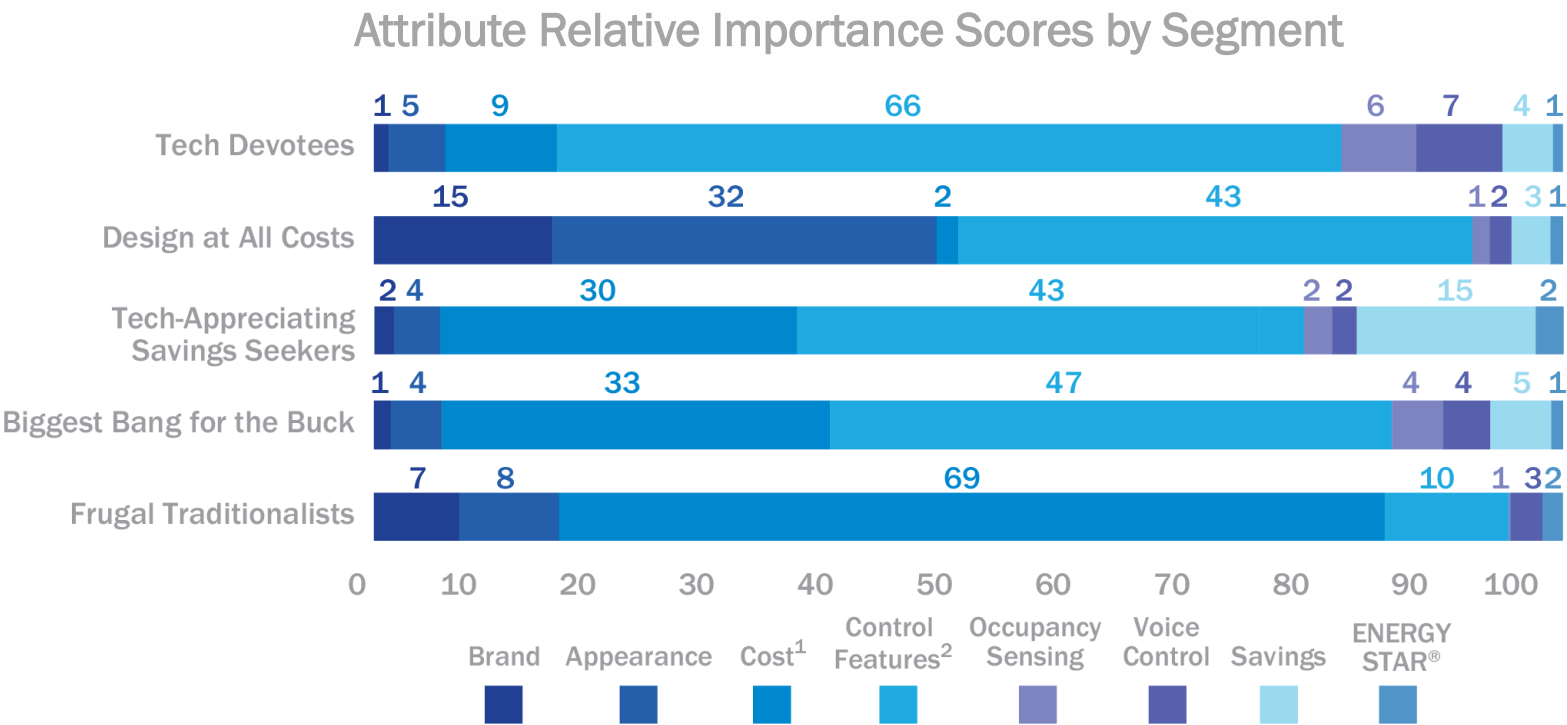
- Looking for as many smart features as possible without overspending
- Exceptionally low motivation to purchase a new thermostat
- Most likely to own their home

Frugal Traditionalists

- Most price sensitive and the only customers to prefer manual
- Least likely to adopt smart thermostats
- None own a smart thermostat
- Disproportionately less educated and lower income

Customer Segmentation – Attribute Preferences

- LCDC model identified five customer segments with distinct patterns of preference
 - Four of the five segments care primarily about control features and prefer advanced controls



¹ Includes both price and installation cost

² Captures whether thermostat is manual, programmable, or home sensing/learning

Customer Segmentation – Current Thermostat Ownership

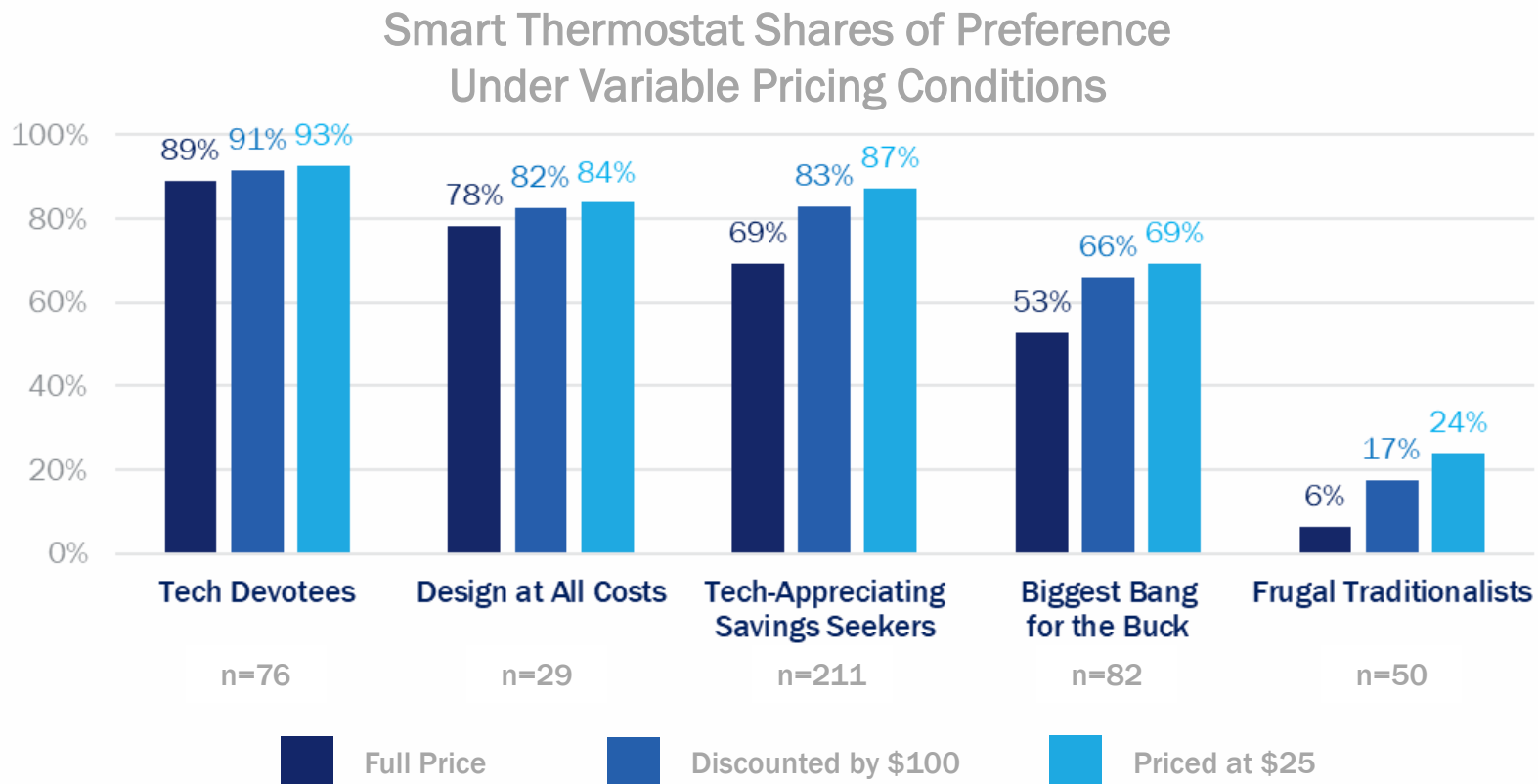
- Customers in each segment can be characterized using other survey responses
- Demographic patterns could support targeted marketing to segments with certain preferences

Thermostats Currently Installed by Segment

	Tech Devotees n=76	Design at All Costs n=29	Tech-Appreciating Savings Seekers n=211	Biggest Bang for the Buck n=82	Frugal Traditionalists n=50
	5%	23%	30%	34%	68%
	71%	62%	64%	58%	32%
	24%	15%	6%	8%	0%

Customer Segmentation – Price Sensitivity

- Price sensitivity varies across segments, but most segments are not highly price-motivated
- The most price sensitive is the one that prefers manual thermostats



Customer Segmentation – Demographics

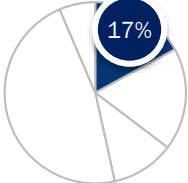
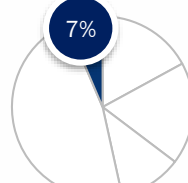
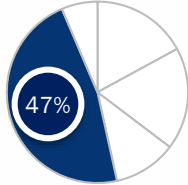
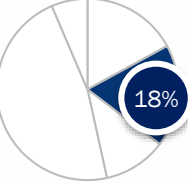
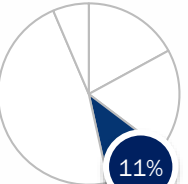
- Customer segments differ across a range of sociodemographic characteristics, including age, education, income, and homeownership status

		<i>Tech Devotees</i>	<i>Design at All Costs</i>	<i>Tech-Appreciating Savings Seekers</i>	<i>Biggest Bang for the Buck</i>	<i>Frugal Traditionalists</i>	<i>General Population</i>
	Segment Size (Householders)	290,000	81,200	487,200	232,500	231,880	1,160,000
	% of Population	25%	7%	42%	20%	7%	100%
	Age						
	Age <35	25%	42%	18%	16%	22%	21%
	Age <35-54	40%	38%	36%	33%	31%	36%
	Education						
	HS or less	16%	23%	28%	20%	35%	25%
	Some college	32%	48%	30%	42%	32%	34%
	Employment						
	Employed	77%	78%	64%	63%	55%	66%
	Retired/Unemployed	23%	22%	36%	37%	45%	34%
	Income						
	Less than \$50k	41%	49%	52%	44%	58%	49%
	\$50k-less than \$75k	24%	19%	22%	19%	22%	21%
	Home ownership						
	\$75k or more	36%	32%	26%	37%	20%	30%
		71%	61%	67%	76%	61%	69%
		n=76	n=82	n=211	n=29	n=50	n=448



Segment Targeting Considerations

 Primary target
  Secondary target
  Not a target

Name	Size	Segment Summary	Targeting Considerations
 Tech Devotees	 17%	- Tech-savvy early adopters with strong preference for advanced control features - Most likely to already own a smart thermostat and to buy at full price	- Highly likely to adopt smart thermostats on their own - Aware of smart thermostat technology and do not require education or incentives
 Design at All Costs	 7%	- Willing to spend any amount for name brand and modern design - Most would buy smart thermostats regardless of price - Tech-savvy	- Likely to adopt smart thermostats on their own - Lowest concern with energy savings signals reduced likelihood of achieving savings without further education - Incentives are likely to be low-impact - Messaging should be visual and highlight thermostat design
 Tech Appreciating Savings Seekers	 47%	- Interest in at least some programmability with appreciation for added tech - Open and willing to purchase smart thermostats, especially as prices drop - Most energy conscious segment	- Marketing to get customers to shop for thermostats is key - Messaging about energy savings is likely to fuel interest - Incentives will likely help boost smart thermostat adoption
 Biggest Bang for the Buck	 18%	- Looking for as many smart features as possible without overspending - Exceptionally low motivation to purchase a new thermostat - Most likely to own their home	- Especially unlikely to replace a working thermostat, but likely to choose a smart thermostat over other products - Incentives are likely to help in overcoming complacency - Less concern with energy use indicates additional education may be needed to promote engagement and maximize savings
 Frugal Traditionalists	 11%	- Most price-sensitive and the only customers to prefer manual - Least likely to adopt smart thermostats - None own a smart thermostat - Disproportionately older, lower income, and less educated	- Hard-to-reach segment - Steep economic and knowledge barriers to adoption - Incentives will play the biggest role in driving smart thermostat adoption, but overall adoption within the segment will be limited even with generous incentives - Best fit for direct install programs

CONCLUSIONS AND IMPLICATIONS



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Conclusions: The Smart Thermostat Market

- Smart thermostat market share has increased dramatically over the past year, but smart thermostats only comprise 8% of all thermostats installed
- Customers who currently have smart thermostats fit the profile of early adopters
 - They are more tech-savvy, younger, more affluent, and have higher levels of educational attainment. They are also less concerned with managing their energy use
- The remaining market for smart thermostats is large – an estimated 1.2 million customers have manual or programmable thermostats

Conclusions: Increasing Smart Thermostat Adoption

- Most customers like the features of smart thermostats and would be willing to purchase one if they had to replace their thermostat
- Thermostats have long lifespans and do not require frequent replacement. Customers will need to be encouraged to replace their older functioning thermostats
 - Thermostat control features, rather than price, drive thermostat preferences, suggesting that discounts and incentives may have less value in encouraging adoption
 - Different customer segments place differing emphasis on various thermostat attributes, calling for customized marketing, messaging, and intervention approaches
 - Thermostats are the latest tech gadget for the early adopters, but customers who aren't tech driven and have a working thermostat could be a more difficult sell
- HVAC upgrades are opportunities to increase customer demand but contractors are a barrier to smart thermostat adoption. Contractors are more likely to recommend and install programmable or manual thermostats than smart thermostats. Customers who select their own thermostats show a greater preference for smart thermostats
 - Contractor education is needed to increase adoption as part of HVAC upgrades

Conclusions: Thermostat Usage

- Users of all thermostat types prioritize convenience and comfort over saving energy when selecting thermostat setpoints
- Many smart thermostat owners ignore the automated smart features of their thermostat and use it like their old thermostat
 - Even those that make use of those features make frequent manual temperature adjustments
 - New smart thermostat owners could benefit from some education on how to use their thermostat to save energy without sacrificing comfort

DISCUSSION



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ADDITIONAL RESULTS



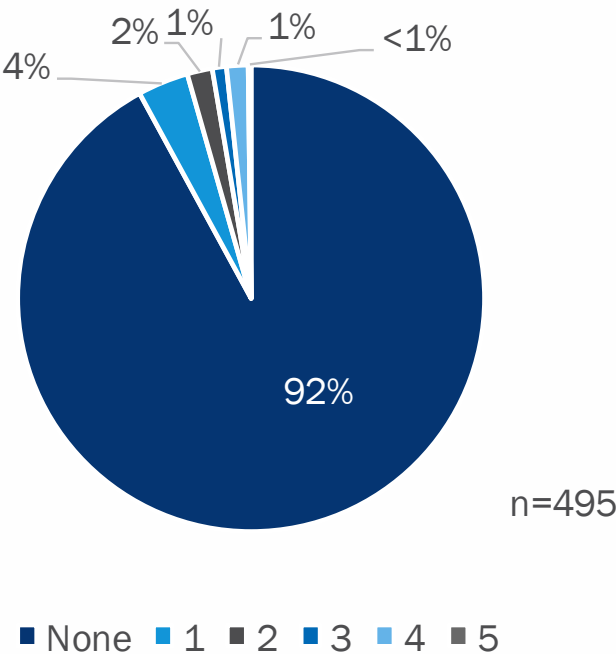
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Other Equipment Penetration

Other Equipment Penetration

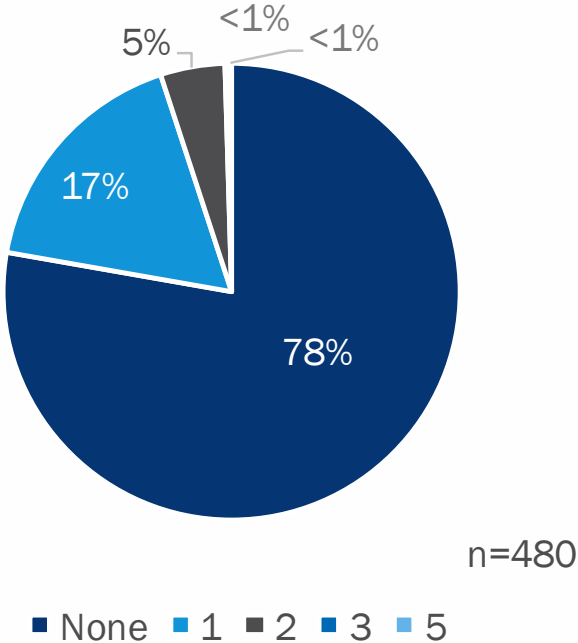
Smart Strips

- While 93% of people own a power strip of some kind, only 8% own at least one smart strip.



Air Purifiers

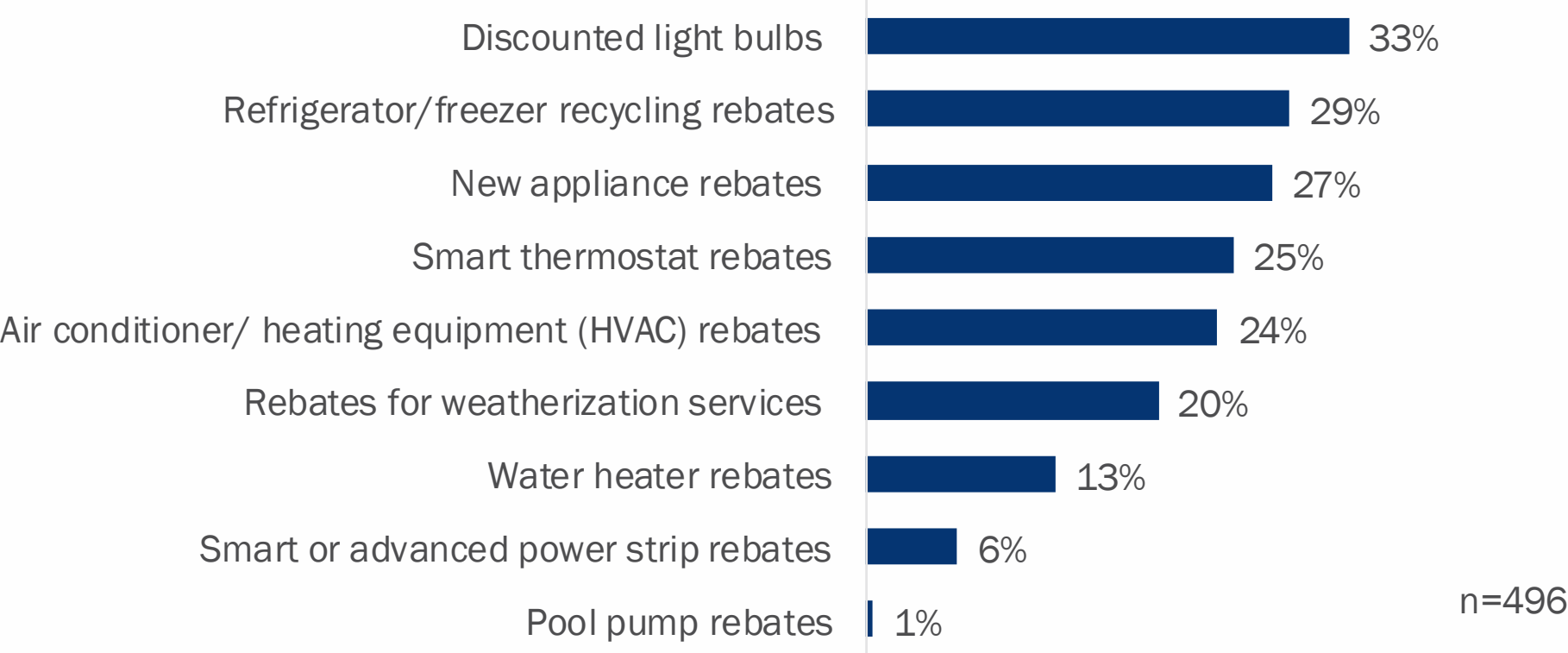
- Nearly a quarter of households have at least one air purifier



Ameren Illinois Program Awareness and Participation

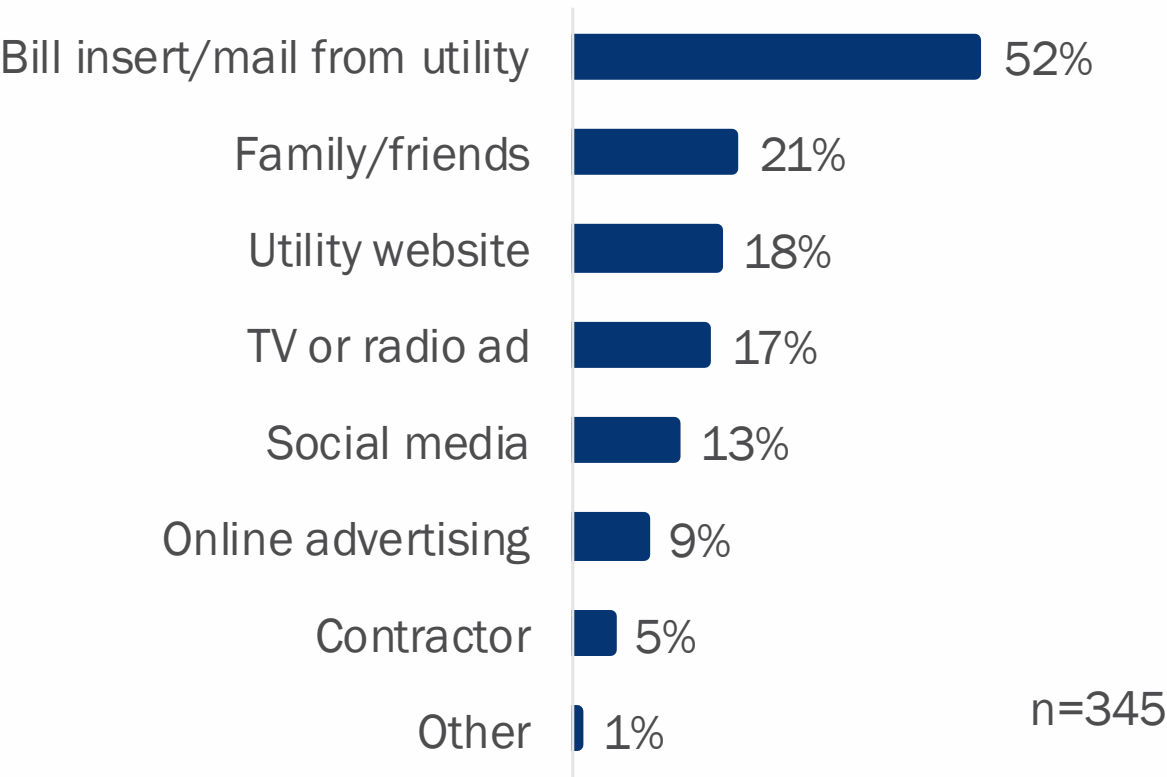
Awareness of Utility Programs

- 70% of customers are aware of one or more Ameren Illinois energy efficiency programs
- Customers are most aware of Ameren Illinois’s rebates on light bulbs (33%)
- A quarter (25%) are aware of smart thermostat rebates



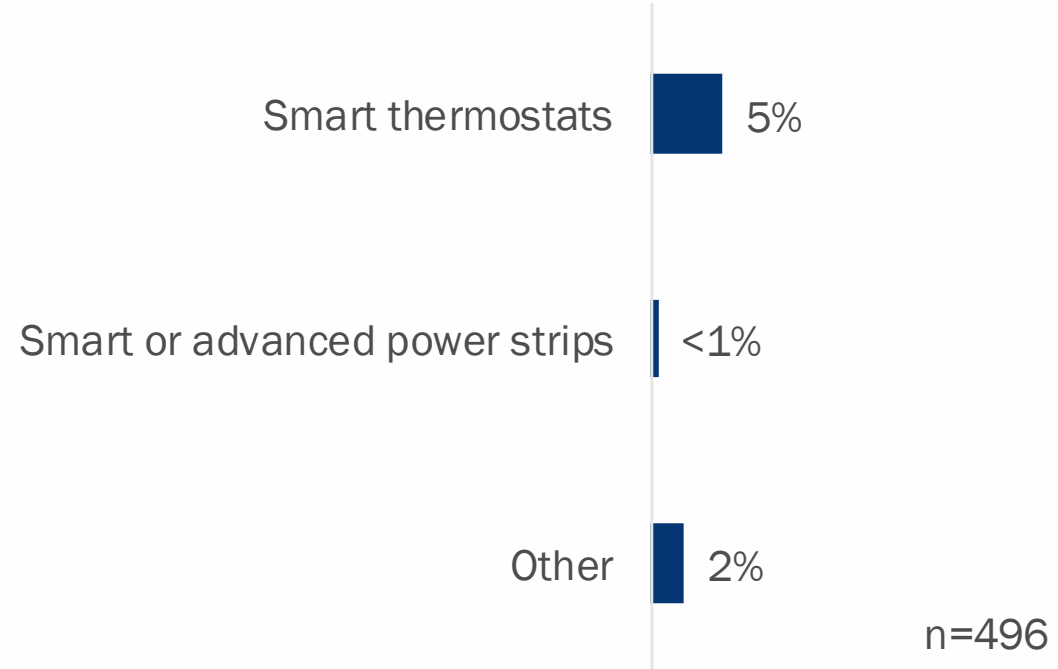
Sources of Program Awareness

- Bill inserts and mailers from utility are the most common sources of program awareness



Participation in Programs

- Overall, 7% of customers received a rebate from Ameren Illinois in the last year
- Smart thermostats were the most common product with 5% reporting purchasing a program-discounted thermostat
- Less than 1% purchased a program discounted smart strip
- 2% of customers report receiving rebates from Ameren Illinois for other products



SEGMENT PROFILES

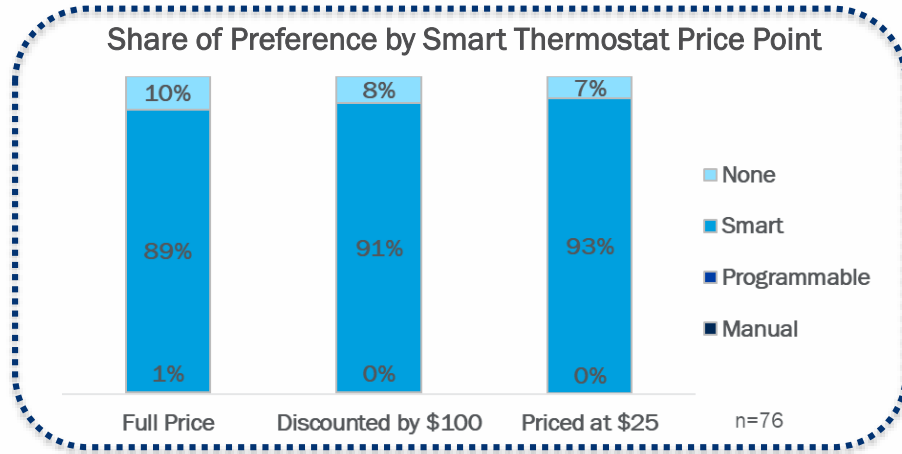
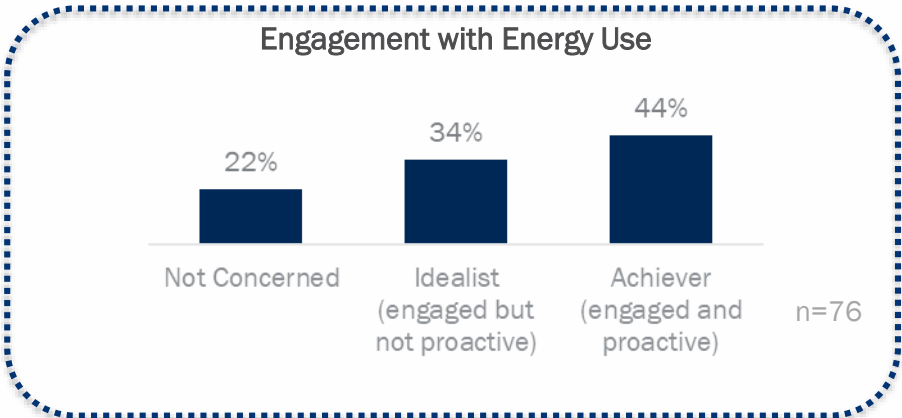
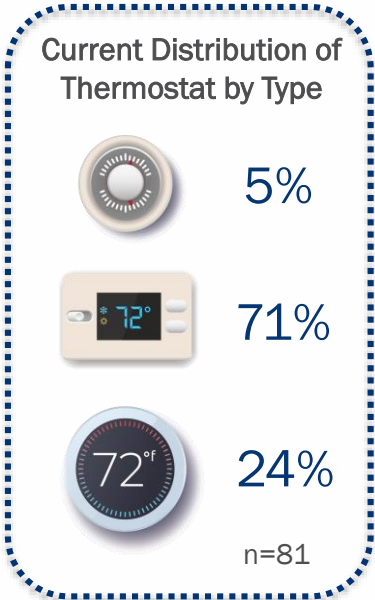
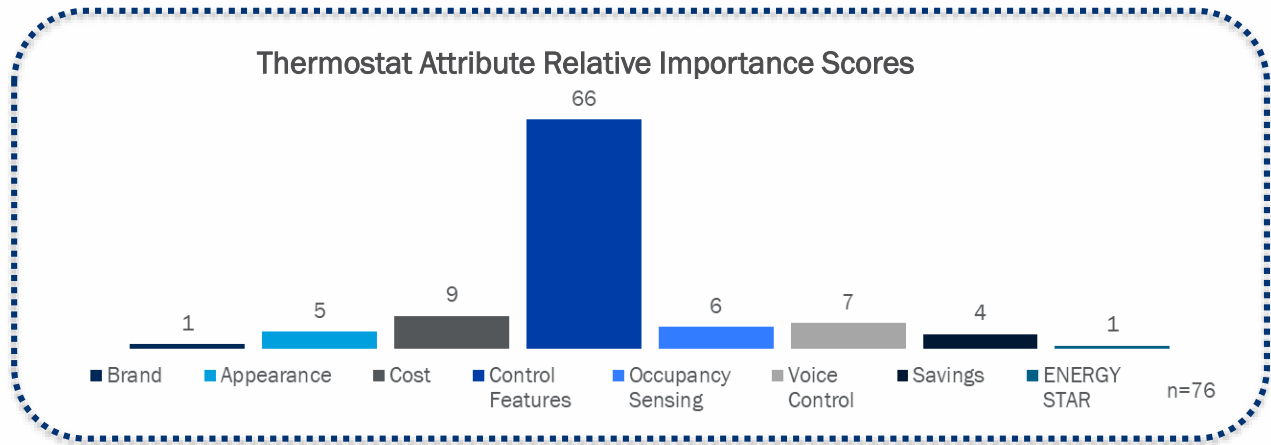


Opinion **Dynamics**

Tech Devotees

- Tech-savvy early adopters
- More likely than any other segment to own smart thermostats
- Strong preference for advanced thermostat control features
- Willing to purchase smart thermostats at full price

		Tech Devotees	General Population
	Segment Size (Householders)	197,900	1,160,000
	% of Population	17%	N/A
	Age		
	Age <35	25%	20%
	Age <35-54	40%	36%
	Education		
	HS or less	16%	25%
	Some college	32%	34%
	Employment		
	Employed	77%	66%
	Retired/Unemployed	23%	34%
	Income		
	Less than \$50k	41%	49%
	\$50k-less than \$75k	23%	21%
			
	\$75k or more	36%	30%
Home ownership		71%	69%
		n=76	n=448

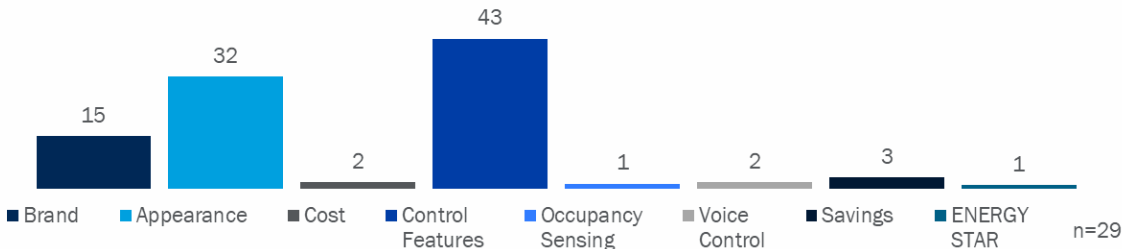


Design at All Costs

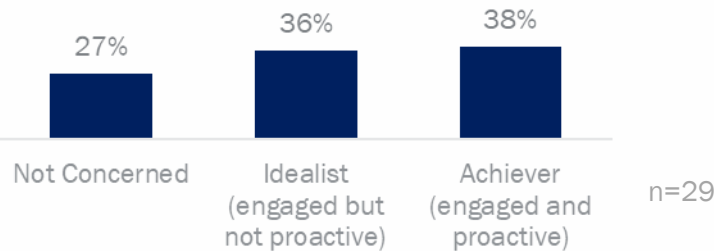
- Willing to spend any amount for name brand and modern design
- Place great importance on advanced control features
- Most would buy smart thermostats regardless of price
- Tech-savvy
- Younger and somewhat less educated

		Design at All Costs	General Population
Segment Size (Householders) % of Population		74,470 7%	1,160,000 N/A
Age	Age <35	41%	20%
	Age <35-54	38%	36%
	Age 55+	21%	44%
Education	HS or less	24%	25%
	Some college	48%	34%
	BA or higher	28%	41%
Employment	Employed	78%	66%
	Retired/Unemployed	22%	34%
Income	Less than \$50k	49%	49%
	\$50k-less than \$75k	19%	21%
	\$75k or more	32%	30%
Home ownership		61%	69%
		n=29	n=448

Thermostat Attribute Relative Importance Scores



Engagement with Energy Use



Share of Preference by Smart Thermostat Price Point



Tech-Savviness Index:
3.4/5
n=29

Current Distribution of Thermostat by Type

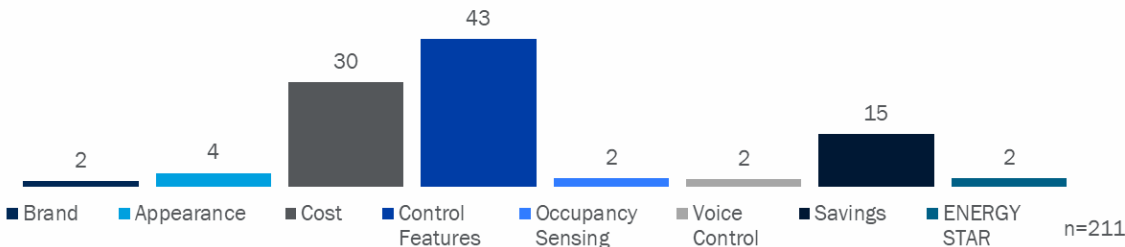


Tech-Appreciating Savings Seekers

- Interest in at least some programmability with appreciation for advanced controls and features
- Open and willing to purchase smart thermostats, especially as prices drop
- Most energy conscious segment

		Tech-Appreciating Savings Seekers	General Population
Segment Size (Householders)		545,550	1,160,000
% of Population		47%	N/A
Age	Age <35	18%	20%
	Age <35-54	36%	36%
	Age 55+	46%	44%
Education	HS or less	28%	25%
	Some college	30%	34%
	BA or higher	42%	41%
Employment	Employed	64%	66%
	Retired/Unemployed	36%	34%
Income	Less than \$50k	52%	49%
	\$50k-less than \$75k	22%	21%
	\$75k or more	26%	30%
Home ownership		67%	69%
		n=211	n=448

Thermostat Attribute Relative Importance Scores

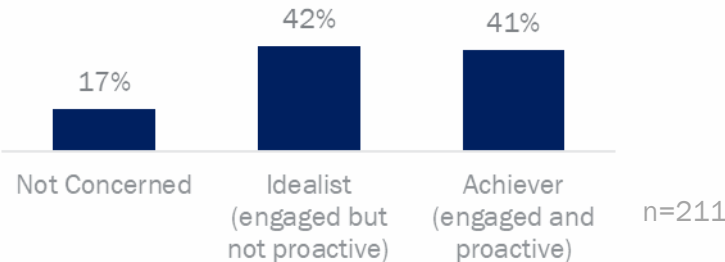


Tech-Saviness Index:
3.4/5
n=211

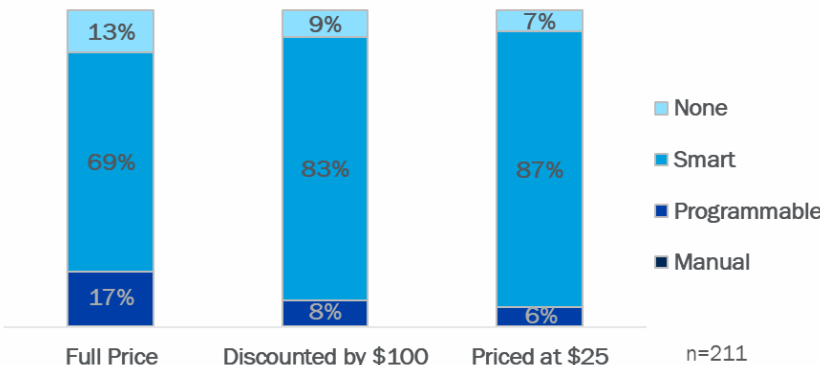
Current Distribution of Thermostat by Type



Engagement with Energy Use



Share of Preference by Smart Thermostat Price Point



Biggest Bang for the Buck

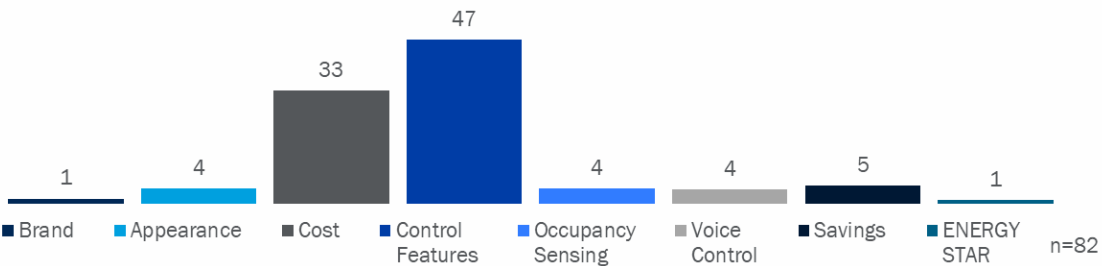
- Looking for as many smart features as possible without overspending
- Least motivation of any segment to purchase a new thermostat
- Most likely of all segments to own their home

		Biggest Bang for the Buck	General Population
	Segment Size (Householders)	211,700	1,160,000
	% of Population	18%	N/A
	Age		
	Age <35	16%	20%
	Age <35-54	33%	36%
	Education		
	HS or less	20%	25%
	Some college	42%	34%
	Employment		
	Employed	63%	66%
	Retired/Unemployed	37%	34%
	Income		
	Less than \$50k	44%	49%
	\$50k-less than \$75k	19%	21%
	\$75k or more	37%	30%
	Home ownership	78%	69%

n=82

n=448

Thermostat Attribute Relative Importance Scores

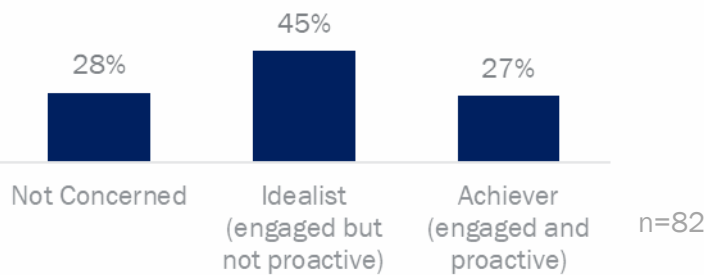


Tech-Savviness Index:
3.4/5
n=82

Current Distribution of Thermostat by Type



Engagement with Energy Use



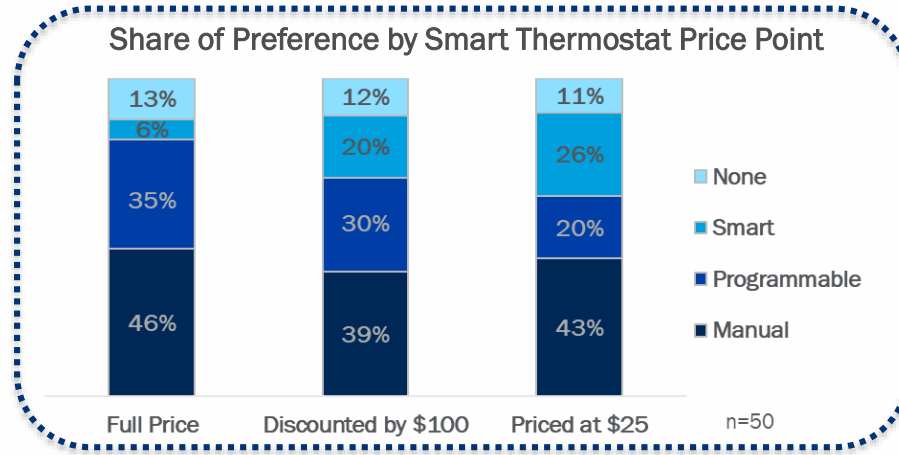
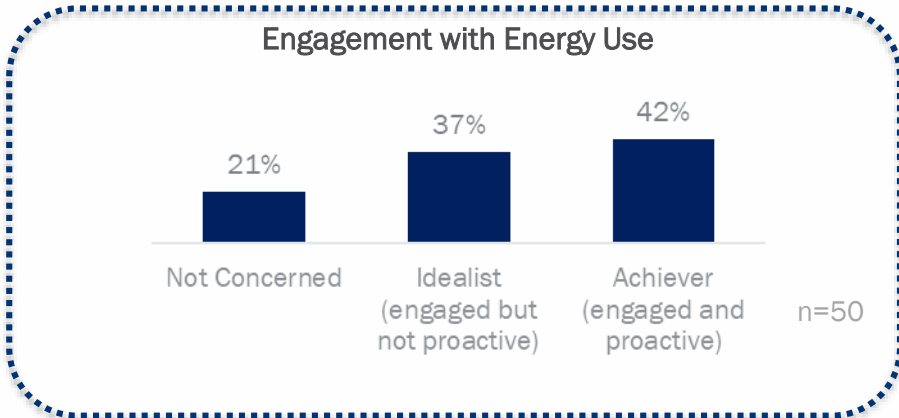
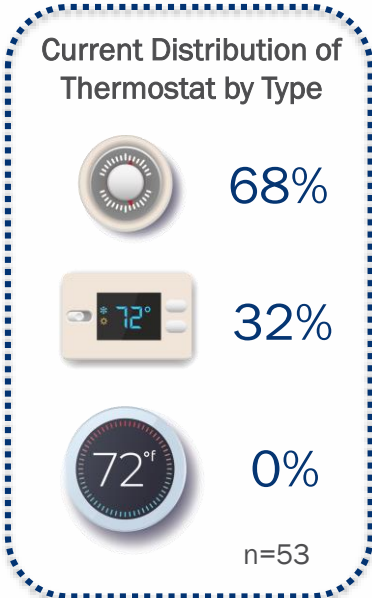
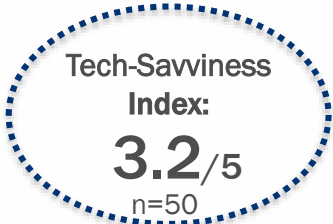
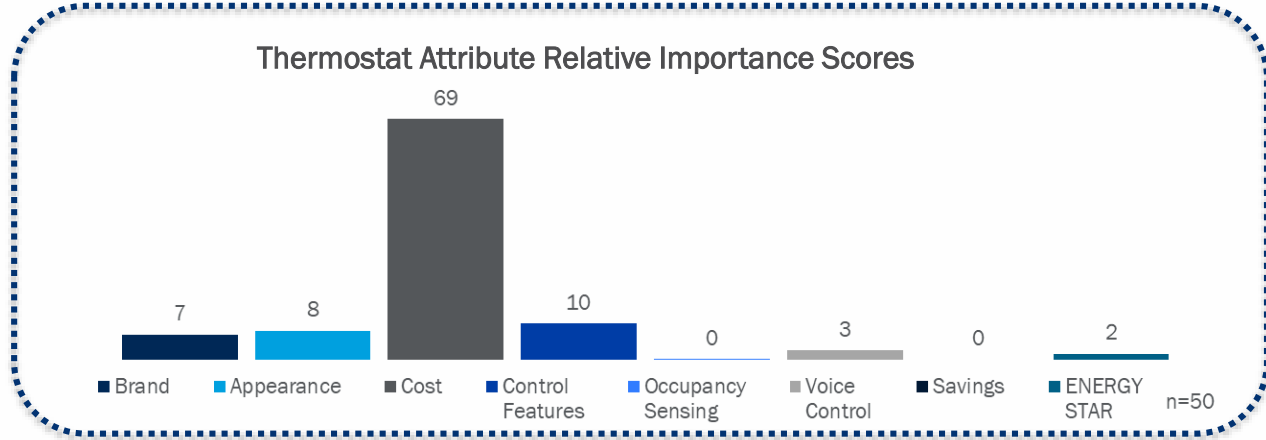
Share of Preference by Smart Thermostat Price Point



Frugal Traditionalists

- Most price-sensitive
- Prefer manual thermostats
- Least likely to adopt smart thermostats
- None currently own a smart thermostat
- Disproportionately less educated, lower income

		Frugal Traditionalists	General Population
	Segment Size (Householders)	130,380	1,160,000
	% of Population	11%	N/A
	Age		
	Age <35	23%	20%
	Age <35-54	31%	36%
	Education		
	HS or less	35%	25%
	Some college	32%	34%
	Employment		
	Employed	55%	66%
	Retired/Unemployed	45%	34%
	Income		
	Less than \$50k	58%	49%
	\$50k-less than \$75k	22%	21%
	\$75k or more	20%	30%
	Home ownership	61%	69%
		n=50	n=448



APPENDIX



Opinion **Dynamics**

Share of Preference Simulations - Inputs

Attributes		Manual	Programmable	Ecobee Lite	Nest E	Ecobee 4	Nest Learning
Brand		Honeywell	Honeywell	Ecobee	Nest	Ecobee	Nest
Style							
Cost*		\$25	\$50	\$170	\$170	\$250	\$250
Thermostat Type	Programmable	No	Yes	Yes	Yes	Yes	Yes
	Home sensing	No	No	Yes	No	Yes	No
	Learning	No	No	No	Yes	No	Yes
Remote access		No	No	Yes	Yes	Yes	Yes
Occupancy sensing		No	No	No	Yes	Yes	Yes
Voice command-enabled		No	No	No	No	Yes	No
Energy savings potential		Up to \$50 per year	Up to \$100 per year	Up to \$140 per year	Up to \$140 per year	Up to \$140 per year	Up to \$140 per year
ENERGY STAR certified		No	No	Yes	Yes	Yes	Yes

* Includes both price and installation cost



Opinion **Dynamics**



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