



Electric and Natural Gas DSM Market Potential Study:

Preliminary Market Research Findings

October 26, 2012

Introductions

EnerNOC Consulting

- Energy Efficiency Potential
 - Bridget Kester
 - Ingrid Rohmund (on phone)
 - Dave Costenaro (on phone)

Definitive Insights, A YouGov Company

- Market research lead, online surveys
 - David Lineweber

Washington University

- Onsite saturation surveys

Agenda

Context

Summary of Residential Research

Residential Sector Findings

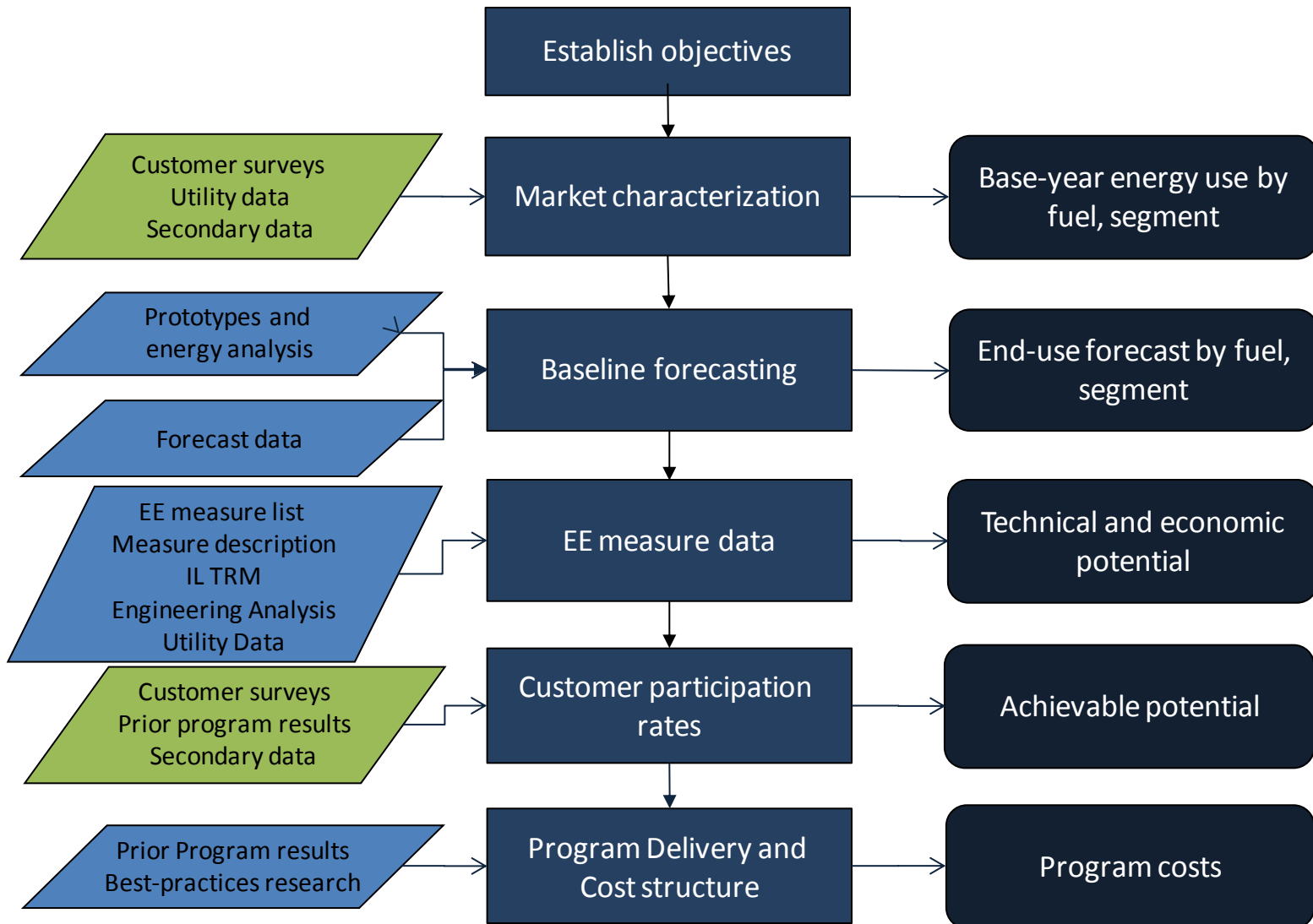
Summary of Non-Residential Research

Non-Residential Sector Findings

Next Steps

Appendix

Review of Analysis Approach for Potential Study



Primary and Secondary Market Research

Primary research consists of customer surveys

- Saturation surveys
 - Residential – online
 - Small and medium business -- online
 - Large C&I – onsite
- Program interest surveys
 - All online

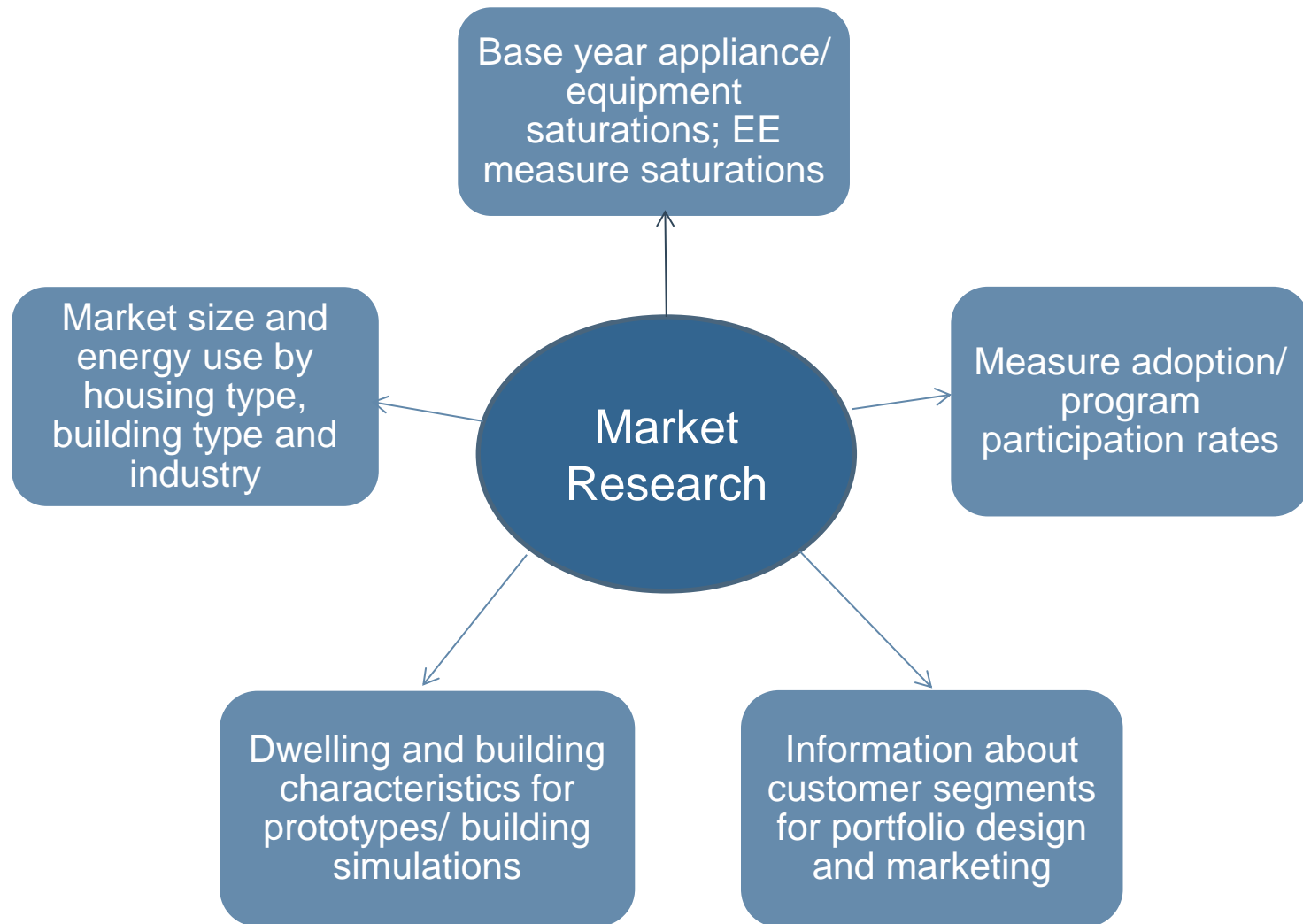
Ameren data

- Billing data
- Forecasts
- Program data

Secondary research

- Illinois statewide data
 - TRM
 - Building codes
- EnerNOC databases/tools
 - Energy market profiles database
 - BEST simulation model
 - DEEM measure data
 - EnergyShape™
- Measure data sources
- Other
 - Annual Energy Outlook forecast
 - Census and EIA data
 - Other potential studies

Applications of Market Research



Agenda

Context

Summary of Residential Research

- **Sample Design**
- **Surveys**
- **Survey Weighting**

Residential Sector Findings

Summary of Non-Residential Research

Non-Residential Sector Findings

Next Steps

Appendix

Overview of Residential Research

- Objective: Identify equipment saturations, building characteristics, measure applicability and saturations, occupant behavior, and interest in programs
- Two types of surveys:
 - Appliance saturation
 - Program interest
- Formal sample design to develop a statistically representative sample
- This presentation covers the results of the market research conducted as part of the study

Market Research Sample Design

- EnerNOC performed a statistical sample design process that defined unique sample matrices for each customer sector
 - The residential sample matrix defined 48 cells which were defined by gas / electric use and region / climate zone
 - Specific sample completion targets were defined for each sample cell
- EnerNOC provided sample
 - Residential sample points were randomly selected at a total ratio of 20:1 ratio, and then parsed into six separate “tranches” (or draws)

Residential Market Research Surveys

- Residential research involved two separate surveys that were completed by independent respondent samples:
 - One survey (the Saturation survey) focused primarily on appliance presence and use, while the second survey (the Program Interest survey) focused on reaction to new energy efficiency programs
 - For both surveys, only two of the three assigned survey tranches ultimately were required
 - All of the sampled households in the survey tranches that were used were mailed a postcard invitation to complete an online survey
 - Those completing the survey received a \$10 payment
- Sample targets were met with this customer sector
 - A total of 726 valid Saturation surveys were captured (with a net response rate just under 8%)
 - A total of 749 valid Program Interest surveys were captured (with a net response rate of just under 7%)

Market Research Survey Weighting

- The sample design for both surveys used a disproportionate sample design
 - This means that some sample cells were surveyed at a higher rate than their natural incidence in the population
 - This occurs most commonly in sample cells that are important for analysis purposes (they are high energy users, for example) but where there are relatively fewer people in those cells
 - In these cases, we intentionally sample more of these respondents than we would get with a simple random sample
 - This is a common approach to sample design when there are analytically important, but lower population parts of the population
- Soft quotas monitored to ensure representation of service territory
 - Usage, age, and geography
- Sample weights were used to bring the final database back into proportion and so that it “looks like” the original population
 - The sample design matrices were used to define the required sample weights

Agenda

Context

Summary of Residential Research

Residential Sector Findings

- **Highlights of Saturation Survey Results**
- Highlights of Likely Program Adoption Rates
- Marketing Issues

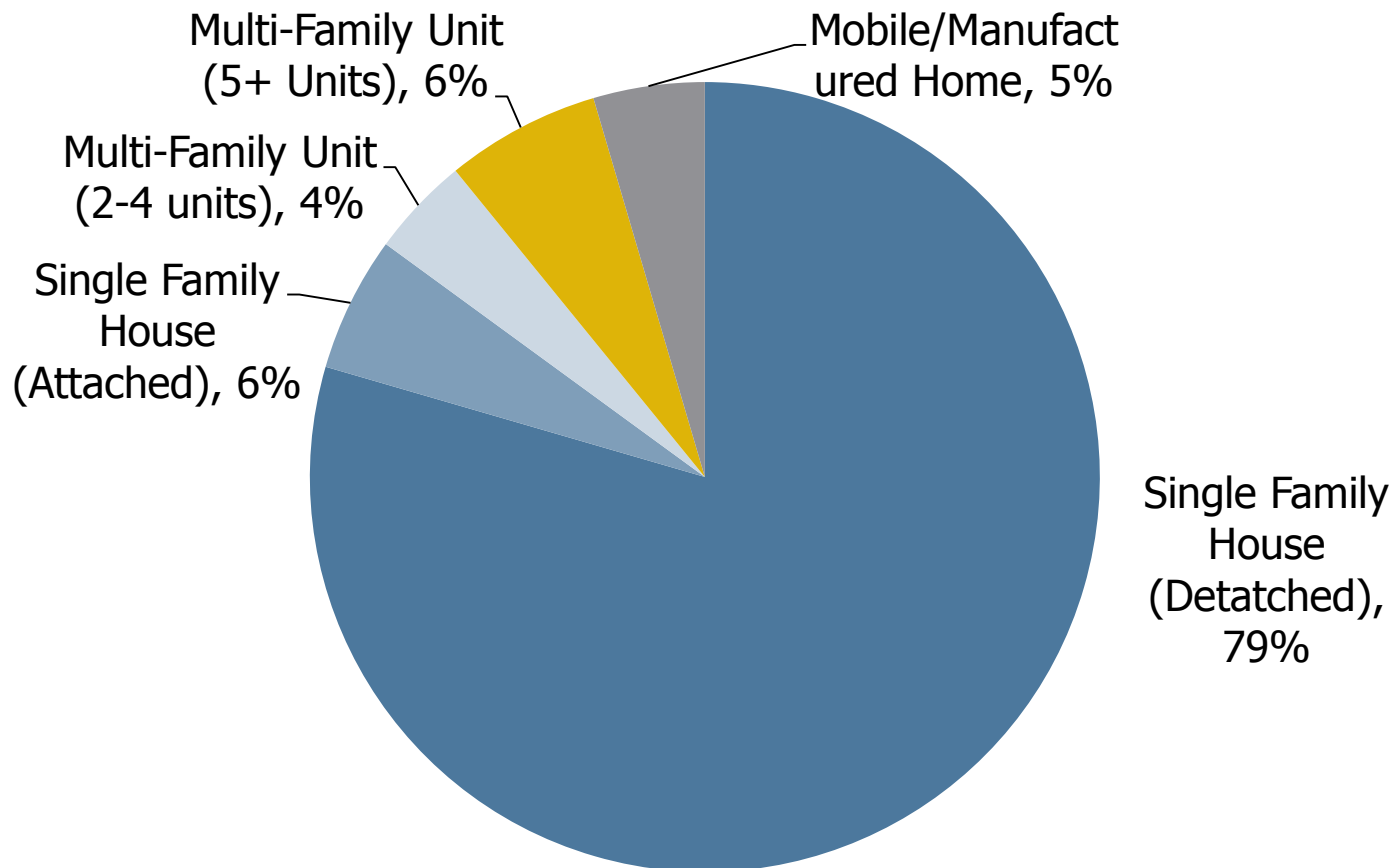
Summary of Non-Residential Research

Non-Residential Sector Findings

Next Steps

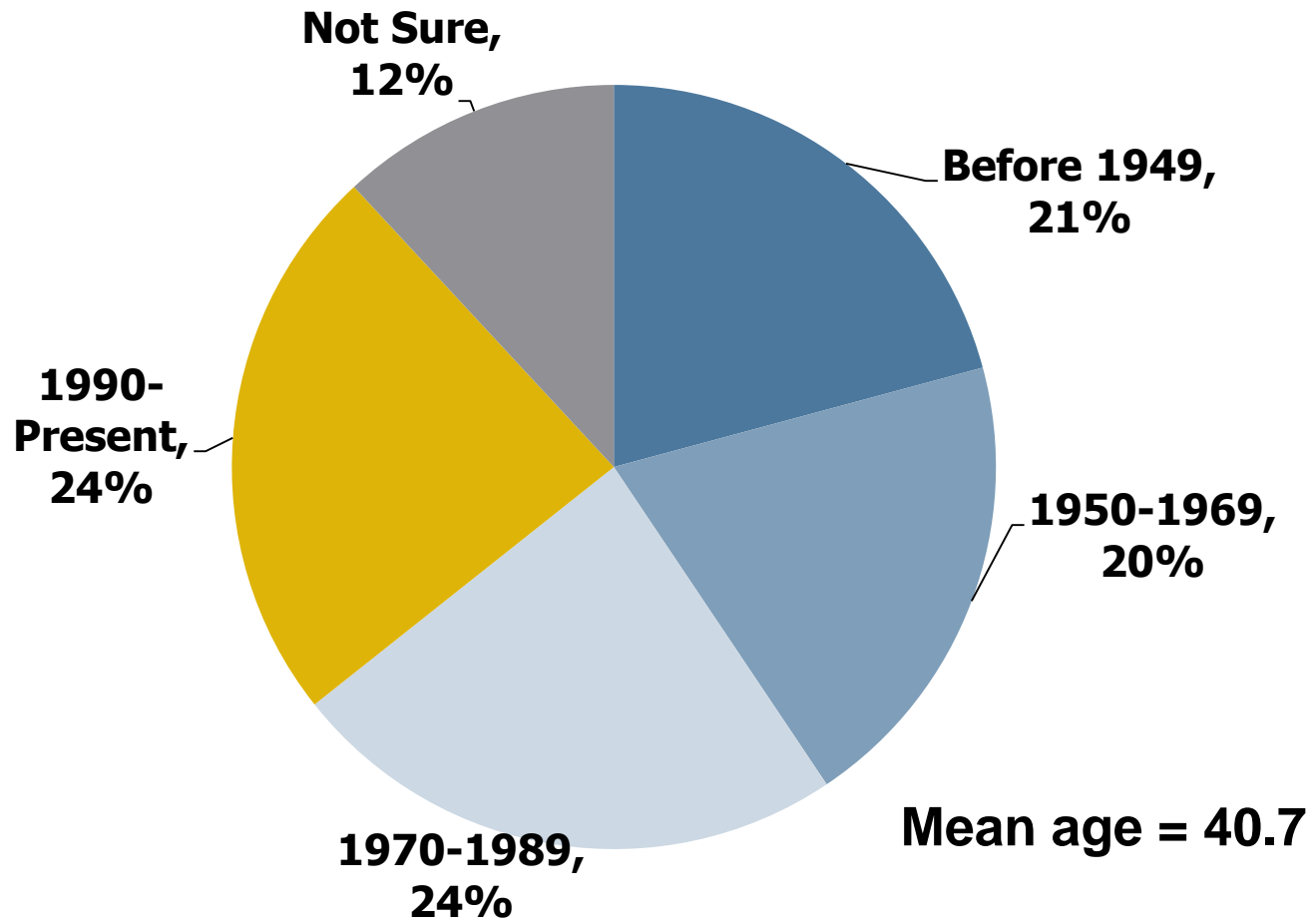
Appendix

Most Homes are Single Family Detached



And Many Homes (41%) Are 40+ Years of Age

Date of Construction



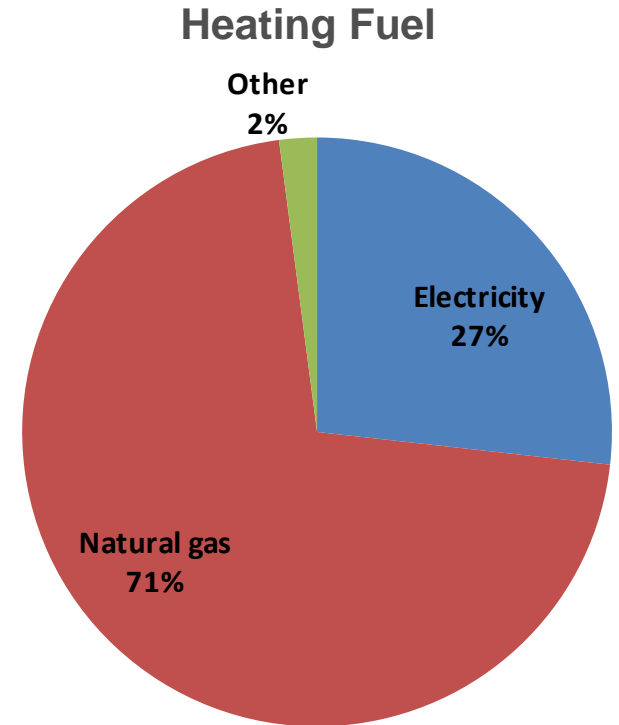
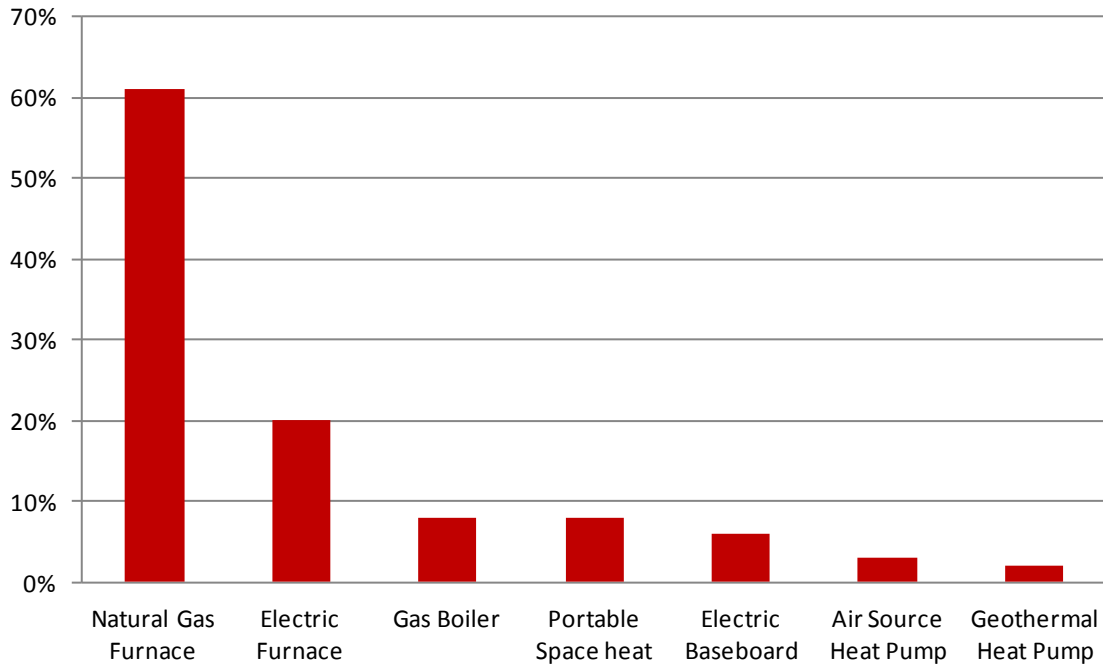
A Plurality Have Less Than 1,500 Square Feet

Square Footage of Heated Living Space	Residential Total
Less than 1,500 sq. ft.	41%
1,500-1999 sq. ft.	25%
2,000-2,499 sq. ft.	14%
2500+ sq. ft.	20%

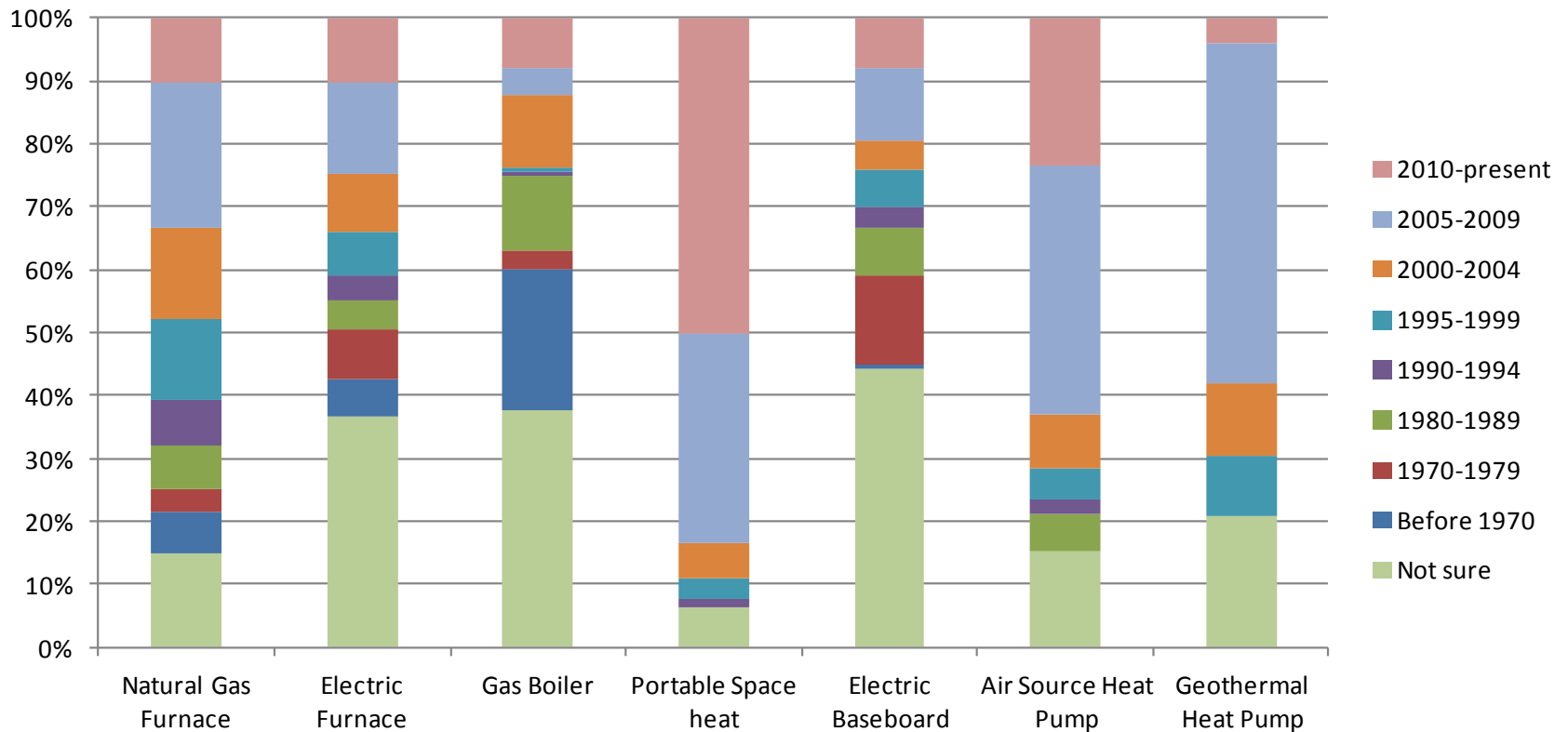
Mean square footage = 1,816
Median square footage = 1,680

Primarily Heat with Natural Gas

Primary Heating Technology Saturation (% of Homes)



Age of Equipment



● Age of equipment translates into SEER level

Natural Gas Furnaces & CAC Are Most Common

Heating Equipment	Don't have / Never use	Less than 50% of winter days	More than 50% of winter days
Natural gas central warm air furnace with ducts/vents to individual rooms	36%	3%	61%
Electric central warm air furnace with ducts/vents to individual rooms	77%	3%	20%
Natural gas central boiler	91%	1%	8%
Portable space heater(s)	70%	22%	8%
Electric baseboard	90%	4%	6%
Air-Source heat pump	96%	0%	3%
Geothermal heat pump	98%	0%	2%
Cooling Equipment	Don't have / Never use	Less than 50% of summer days	More than 50% of summer days
Central air conditioner	19%	7%	74%
One or more ceiling, window, or room fans	36%	16%	49%
One or more room air conditioners mounted in or near a window or on a wall	80%	6%	14%
One or more portable dehumidifiers	86%	5%	9%

CFLs Make Up 31% of All Bulbs / Lamps

House Square Footage	Conventional light bulbs /Incandescent lamps (mean)	CFLs (mean)	Tubular fluorescent lamps (mean)	Halogen light bulbs (mean)	LED light bulbs (mean)	Low voltage lamps (mean)	Other types of lighting (mean)	Total (mean)
< 1,500	10.6	8.7	2.9	1.0	0.3	1.0	0.8	25.3
1,500-1,999	19	12.1	4.6	1.3	0.9	0.9	0.5	39.3
2,000-2,499	27.8	15.4	4.0	1.6	0.2	2.0	0.5	51.5
2,500 +	31	17.8	6.4	2.1	1.0	3.2	1.4	62.9
Total	19.1	12.3	4.1	1.3	0.6	1.5	0.8	39.7

Significant Increase in CFLs Since the 2009 Study

	Conventional light bulbs /Incandescent lamps (%)	CFLs (%)	Halogen light bulbs (%)	LED light bulbs (%)	Other types of lighting (%)
2009 Study	82%	17%	1%	N/A	N/A
2012 Study	48%	31%	3%	1%	17%

- The increase in CFLs is a result of the success of lighting programs

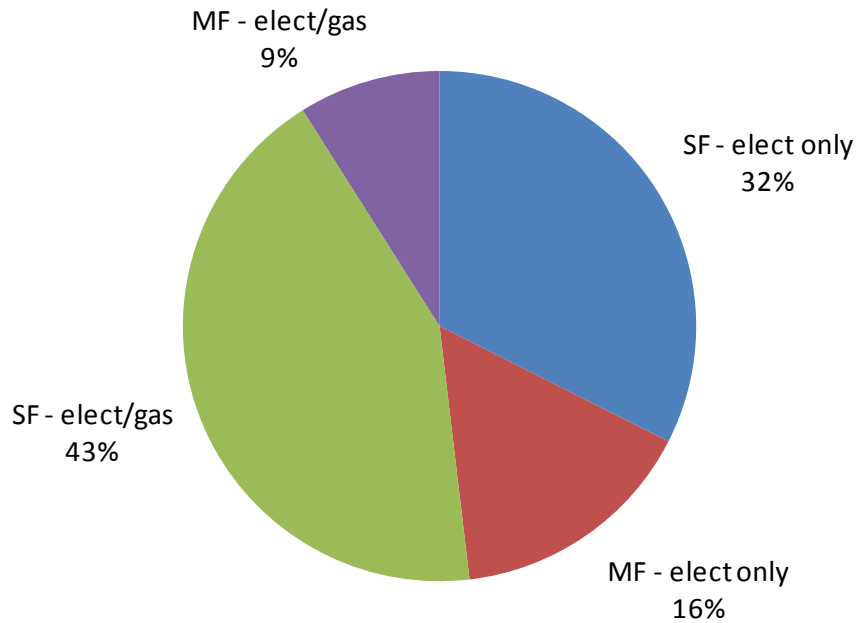
Comparison of Electric Technology Saturations

Technology	2012 Saturation	2009 Saturation
Central AC*	77%	79%
Room AC*	16%	14%
Heat Pump (air source and geothermal)*	2%	3%
Programmable thermostats	52%	42%
Water Heater*	30%	33%
Clothes Washer	88%	93%
Clothes Dryer*	72%	72%
Dishwasher*	62%	59%
Freezer	44%	50%
Second Refrigerator*	27%	24%
Stove	60%	53%
Personal Computers	73%	58%
Monitor	73%	63%
TVs	272%	250%
Set-top Boxes/DVR	245%	200%
Pool Pump*	6%	9%

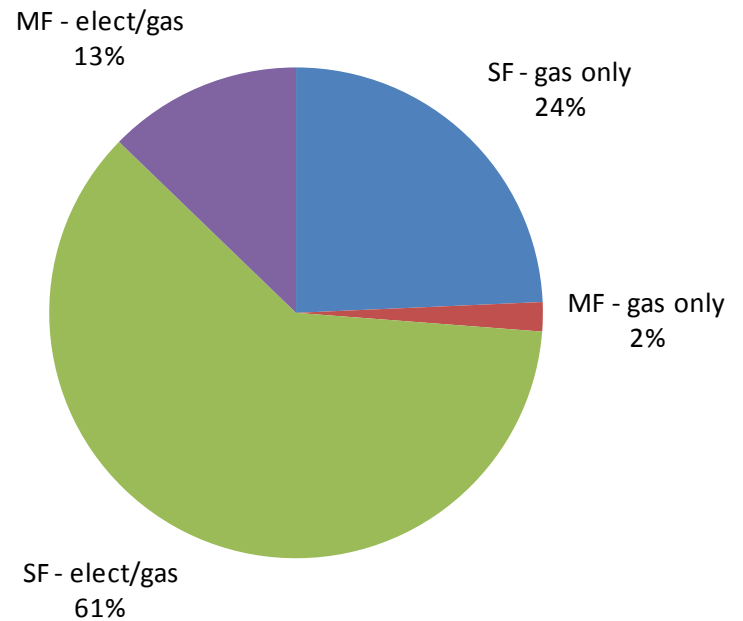
* Difference in estimates is not statistically significant

Market Characterization

Electric Customers by Housing Type



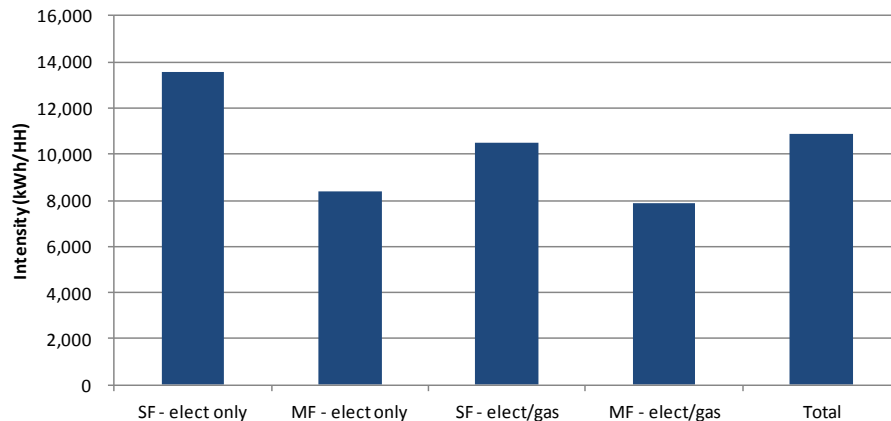
Natural Gas Customers by Housing Type



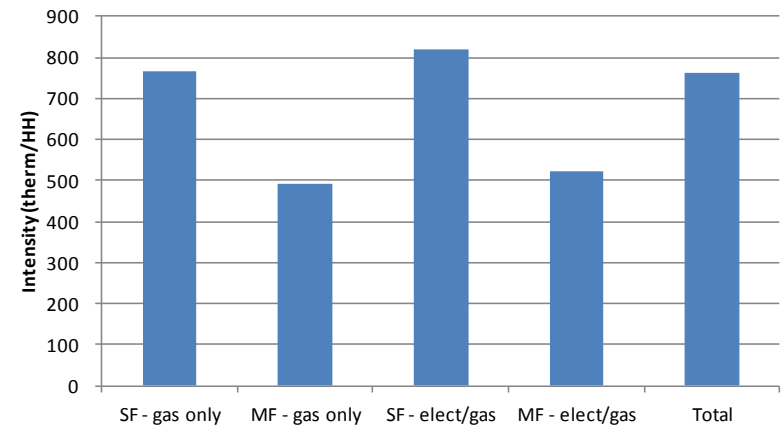
Household Energy Use by Housing Segment

- Utility bills were linked to survey responses: allows us to calculate household intensities by housing type
- As expected, single family homes have a higher intensity than multi-family

Annual Electricity Use (kWh/hh)



Annual Natural Gas Use (therms/hh)



Agenda

Context

Summary of Residential Research

Residential Sector Findings

- Highlights of Saturation Survey Results
- **Highlights of Likely Program Adoption Rates**
- Marketing Issues

Summary of Non-Residential Research

Non-Residential Sector Findings

Next Steps

Appendix

Estimating Likely Takers

- Survey respondents were asked about the likelihood that they would participate in each of 25 different energy efficiency / conservation programs
 - 10 programs involved providing rebates to acquire higher than standard efficiency refrigerators, computers, pool pumps, etc.
 - 3 programs had to do with providing incentives for more regular maintenance or inspection and repair
 - 9 programs had to do with installing new home EE measures such as low-flow showerheads, Smart power strips, improved insulation, or the like
 - 3 programs were purely behavioral conservation programs (e.g., lowering water heater temperature level)

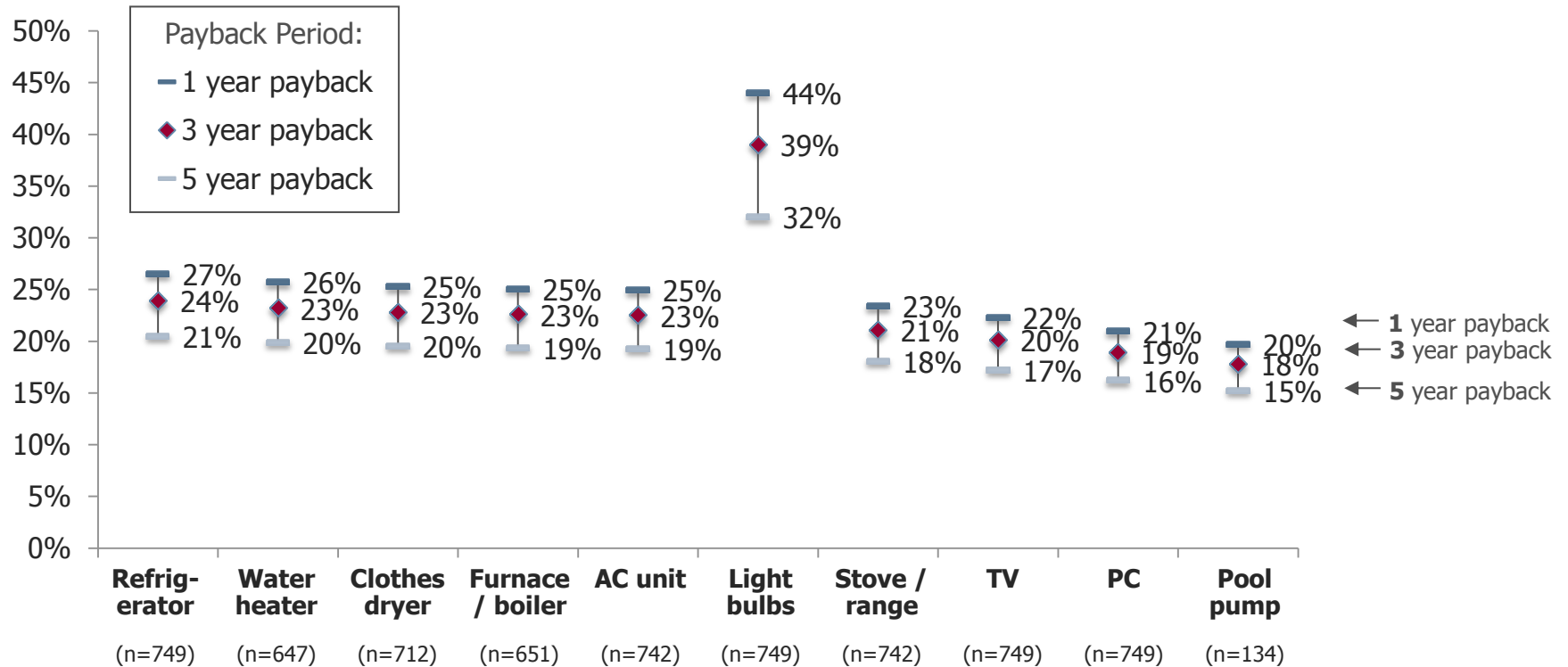
Estimating Likely Takers

- For each of the 22 incentive-related programs, the team captured information on the respondent's stated likelihood that they would adopt this measure either immediately on offer, or at appliance end of life (as appropriate)
 - Stated likelihood to adopt was reported for each measure on a “1” to “10” scale where “1” was labeled as “Not At All Likely To Do This,” and “10” was labeled as “Extremely Likely To Do This”
 - The team captured this information in a way that allowed us to estimate likelihood to adopt ratings for each of three payback periods (where appropriate) – 1, 3, and 5 year paybacks

Estimating Likely Takers

- Initial customer responses were then adjusted to account for the “say / do” overstatement issue
 - This issue refers to the fact that – for multiple reasons -- survey respondents tend to overstate the likelihood that they will take a future action, and specifically to “buy” (or adopt) a new product or service
 - The logic used to make these adjustments is based on proprietary research conducted by YGDI and deflates the stated likelihood that a given customer will adopt a given measure by a percentage that depends on the rating they provided for that program, on their level of familiarity with the product category (in this case, energy efficiency), and with the regularity of their purchase
 - In this work we counted lighting purchases as more “regular” (i.e., more often than once a year, and used a different adjustment factor for this category)
 - The “likely taker” values reported in the remainder of this document represent these “adjusted” values
- See the appendix for these adjustment values

Likely Takers by Payback Period – EE Equipment



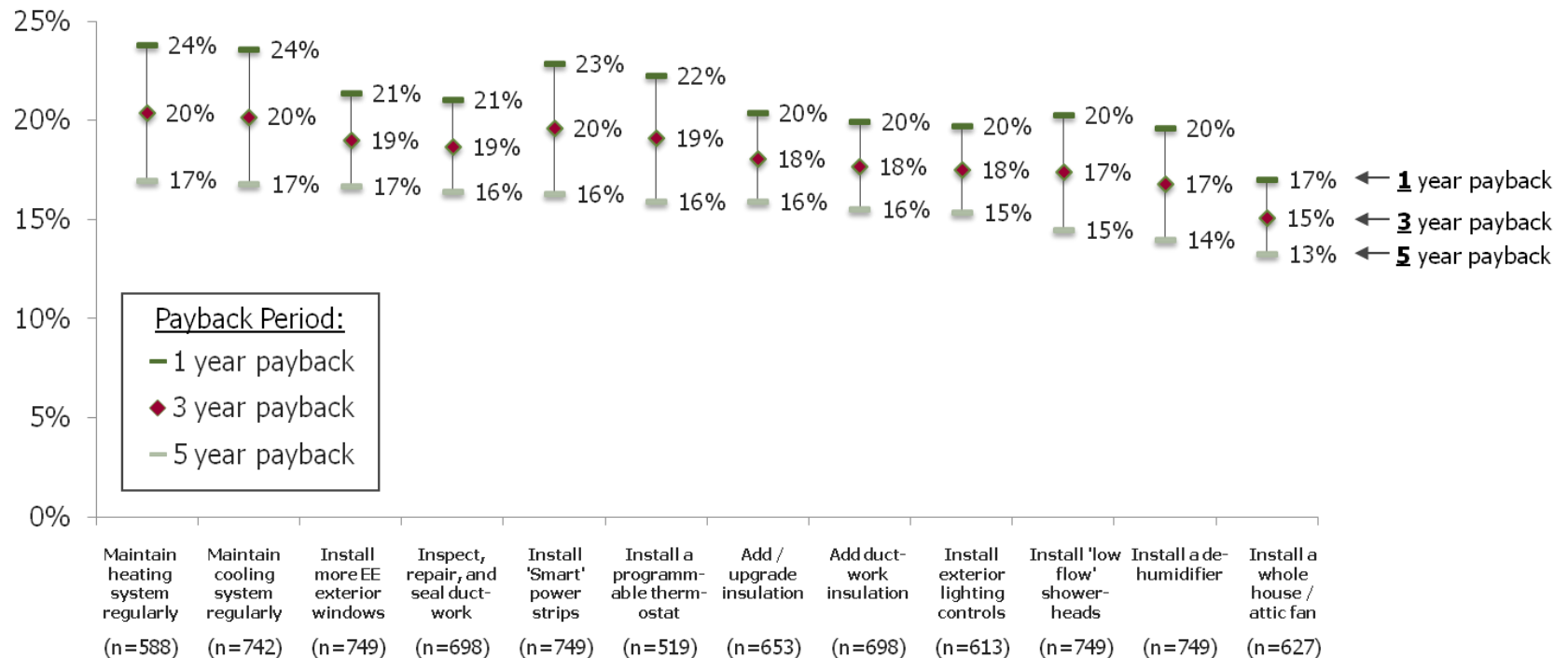
Q25-27/Q28/Q33/-35/Q37-39

*Note: Assumes a normal replacement cycle

Likely Takers by Payback Period – Maintenance and Other Measures

Likely Takers By Payback Period

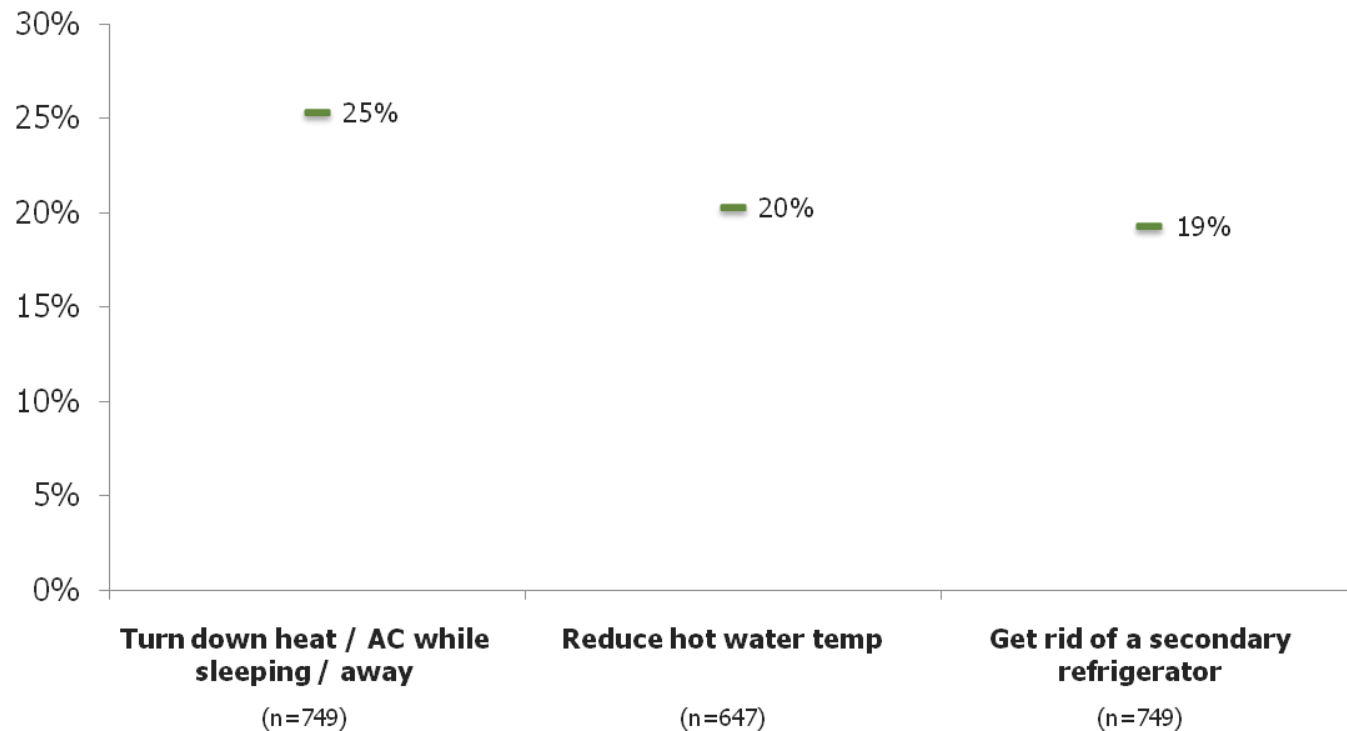
(Total Residential Customers)



Q25-27/Q28/Q33/-35/Q37-39

Likely Takers by Payback Period – Behavioral

Likely Takers (Total Residential Customers)



Agenda

Context

Summary of Residential Research

Residential Sector Findings

- Highlights of Saturation Survey Results
- Highlights of Likely Program Adoption Rates
- **Portfolio Design and Marketing Considerations**

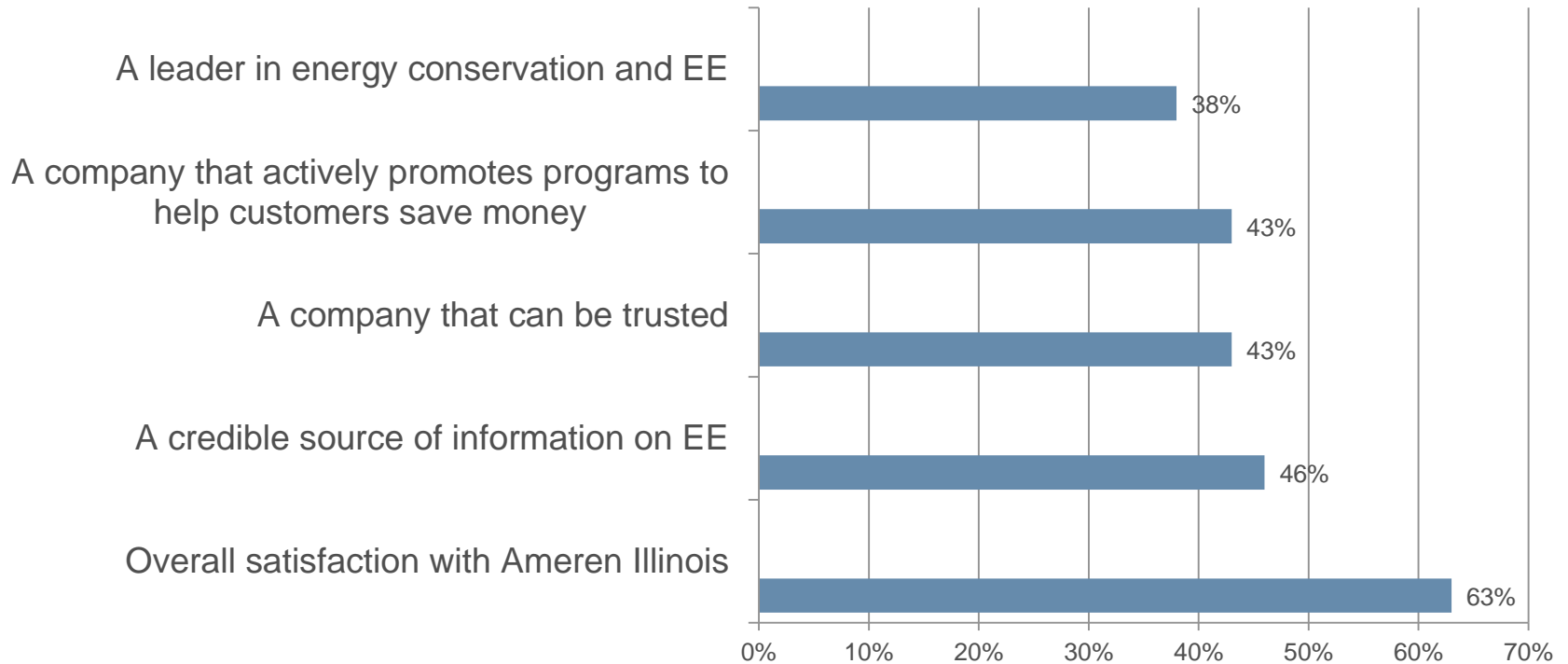
Summary of Non-Residential Research

Non-Residential Sector Findings

Next Steps

Appendix

Residential Customer Opinion of Ameren Illinois

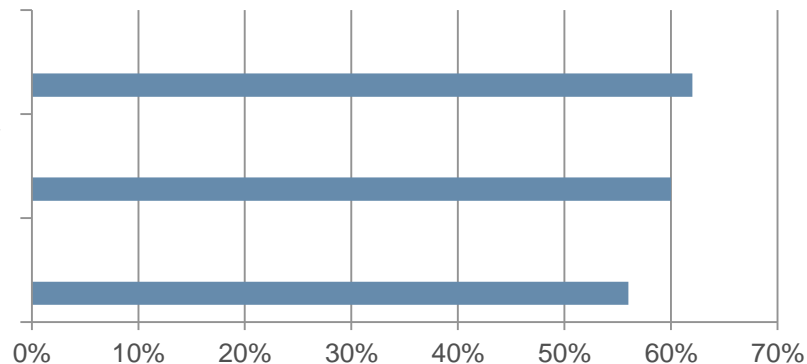


Top 3 box ratings on 1-10 scales

Residential Customers Support EE / Green Initiatives, But Not if This Would Lead to Higher Costs

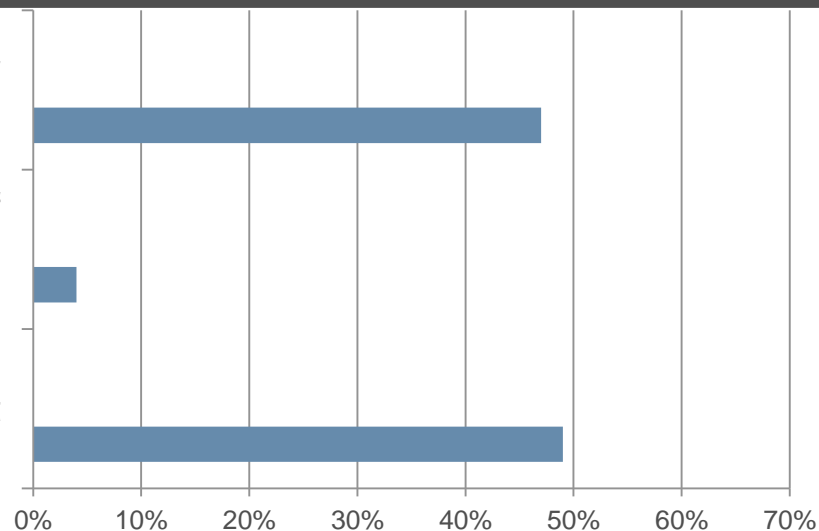
A majority say "yes, do the green / EE stuff"

- Actively encourage customers to participate in energy savings / cost savings programs
- Do everything possible to supply renewable / clean energy
- Operate in a completely environmentally friendly way



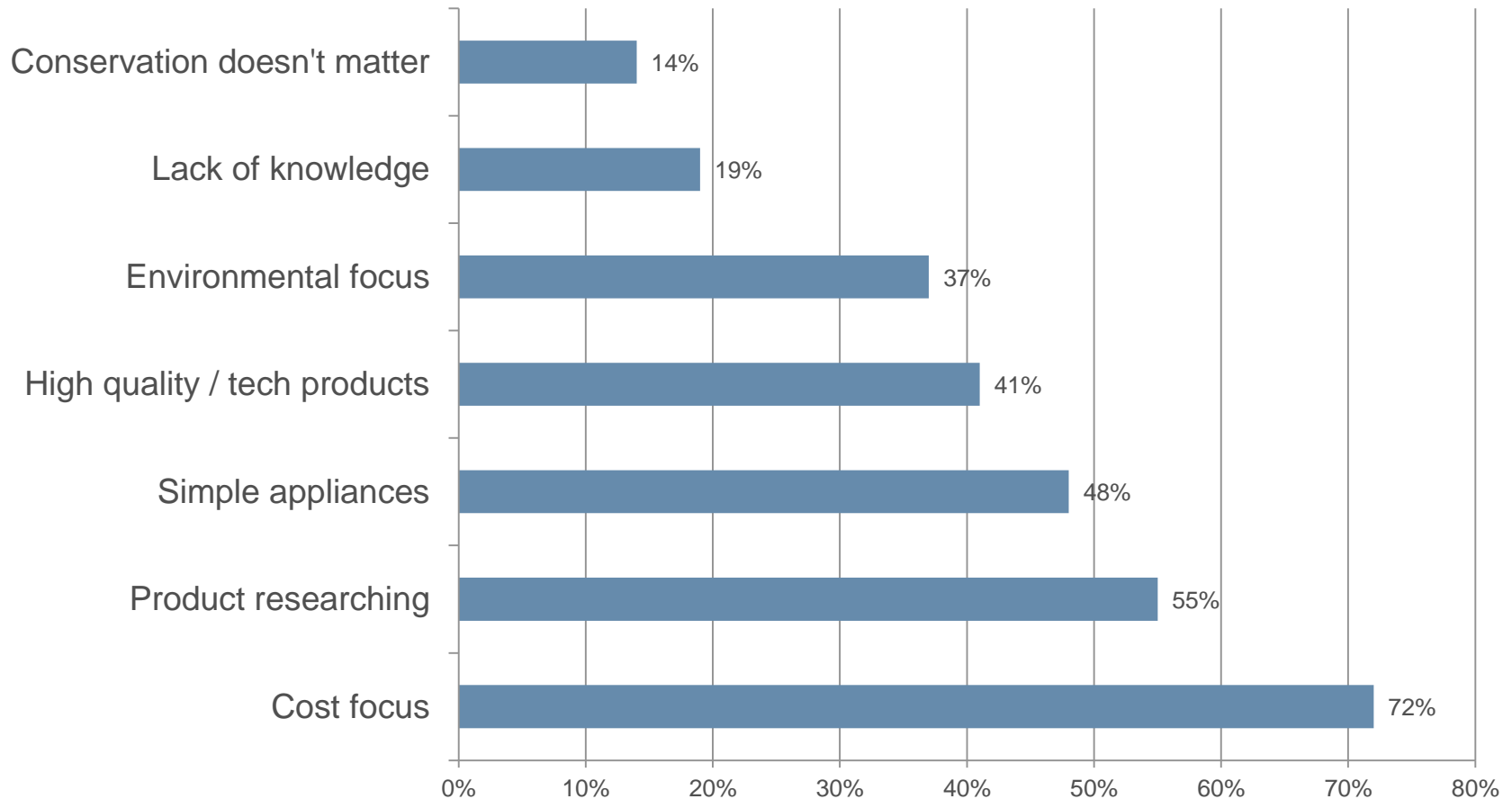
But almost no one says "Do the green / EE stuff even if it means I would have to pay a little more"

- Do everything possible to keep costs as low as possible
- Pursue other (EE / green) initiatives even if this would mean you would have to pay a little more
- Both are equally important



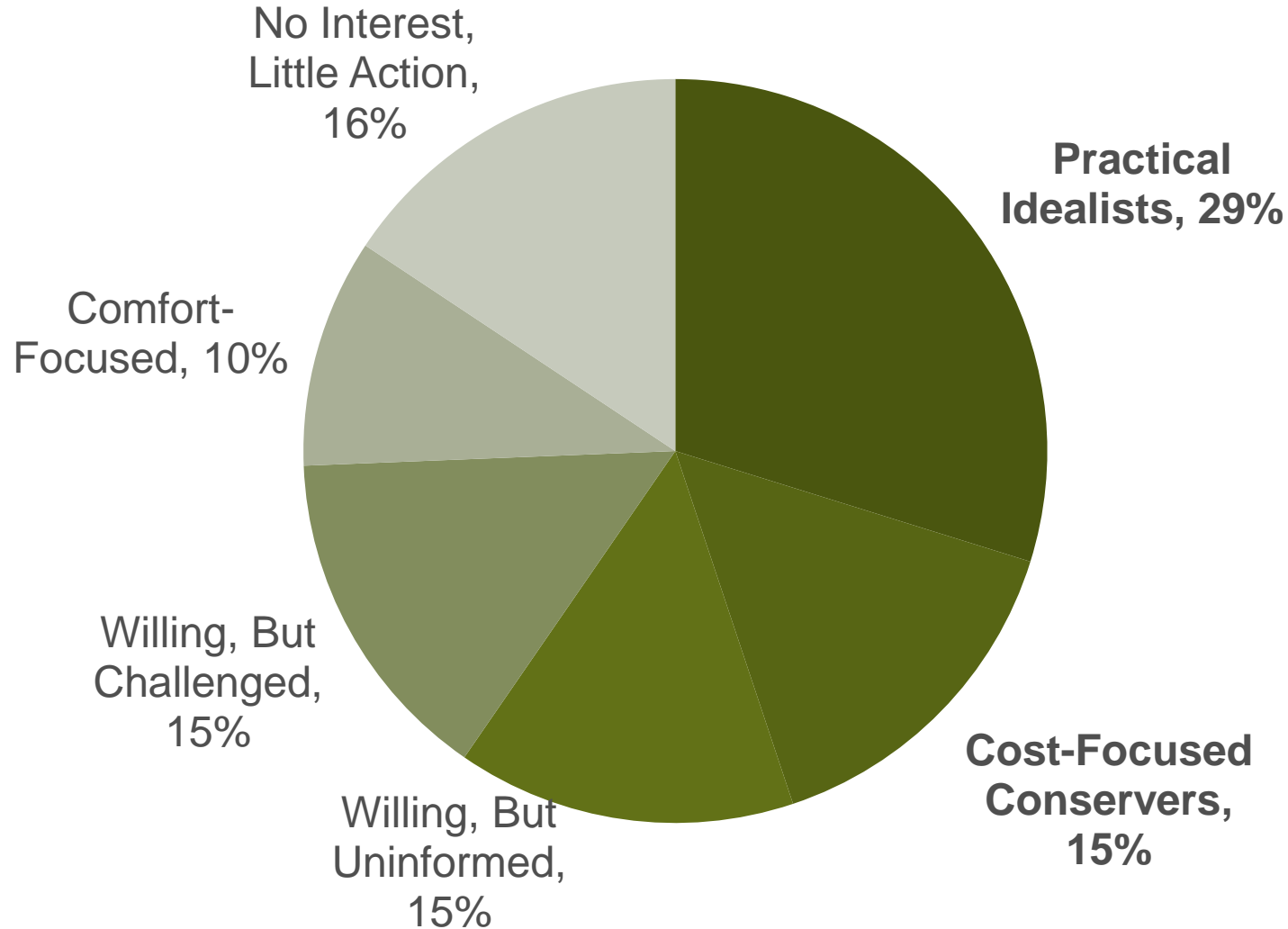
Top 3 box ratings on 1-10 scales

Core Residential Customer Attitudes Reflect a Dominant Cost Focus



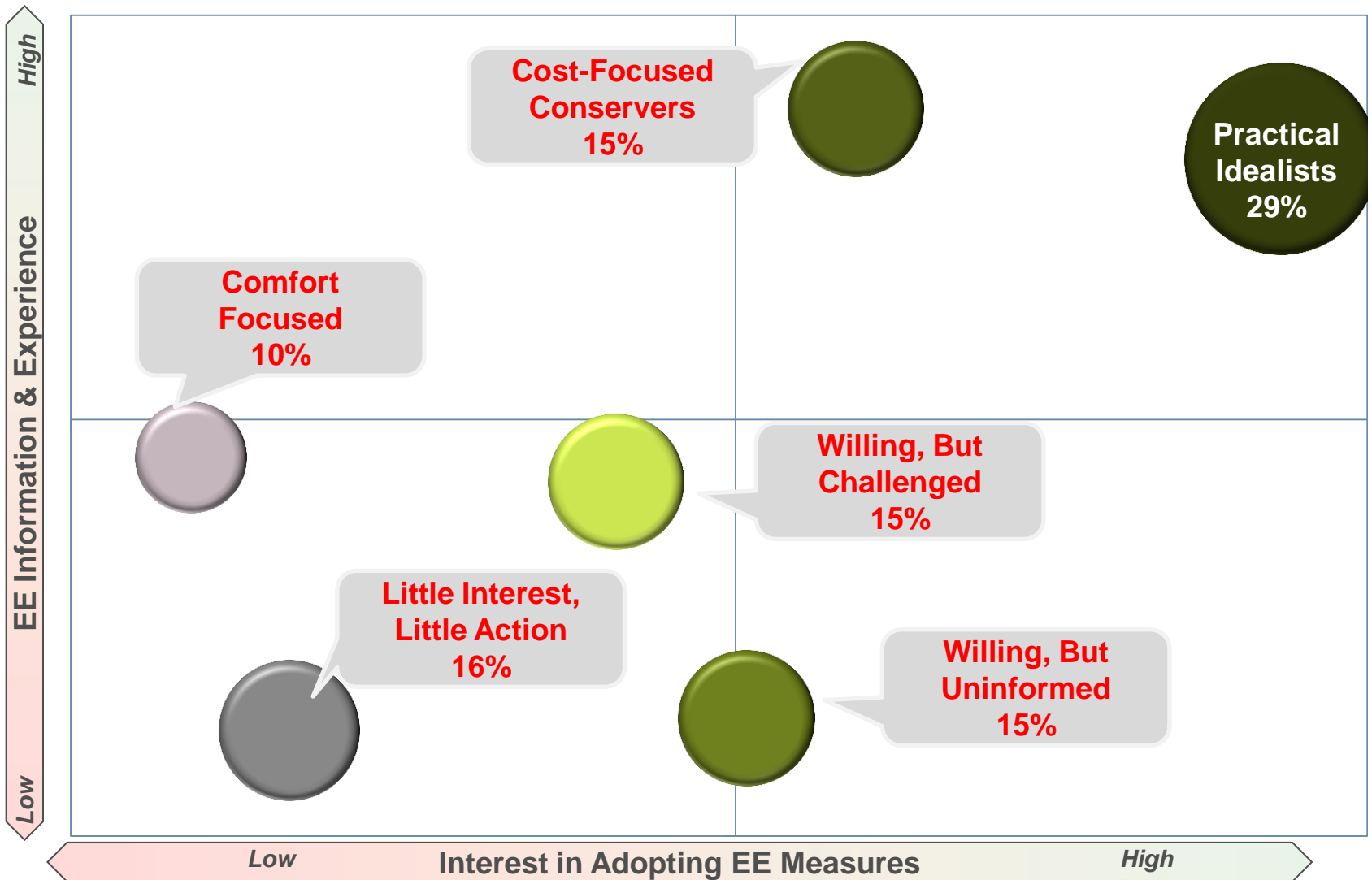
Top 3 box ratings for selected attitudinal items on 1-10 scales; items selected based on factor analysis results

Ameren Illinois Residential Customer Segment Profile



- If programs continue as currently run, we would not expect significant participation from the 56%

Sorting the Residential Customer Segments



Bubble size represents segment size

Segments at a Glance

	Practical Idealists	Cost-Focused Conservers	Willing, But Uninformed	Willing, But Challenged	Comfort Focused	Little Interest, Little Action
Size	29%	15%	15%	15%	10%	16%
Opportunity	<p>High</p> <p>They have done a lot already, but are open to – and able to – do more</p>	<p>Medium-High</p> <p>Experienced in EE and willing to do more; if the money is right</p>	<p>Medium-Low</p> <p>Willing to be convinced of the advisability of EE actions, but not convinced to date</p>	<p>Medium-Low</p> <p>Open to the possibility of EE actions, but see themselves as very limited in their opportunity to take advantage and have not done so yet</p>	<p>Low</p> <p>No interest in the EE category; “leave me alone”</p>	<p>Very Low</p> <p>Totally uninvolved with the energy category and no interest in becoming so</p>
Role for Ameren Illinois	<p>Trusted Green Partner:</p> <p>They like the company and see Ameren Illinois as having an important role in both EE and promoting green initiatives</p>	<p>Save Us Money:</p> <p>Broadly negative toward the company; just want Ameren Illinois to focus on lowering costs (for me)</p>	<p>Help Me:</p> <p>They like the company and want it to help them become more energy efficient (though they are not certain this is possible).</p>	<p>Help Me:</p> <p>They like the company but do not think that EE is something that is relevant for them, or is something that they can afford, or figure out how to make work for them</p>	<p>Leave Me Alone:</p> <p>Don’t like the company, don’t trust it, and just want to be left alone</p>	<p>Don’t Bother Me:</p> <p>Like the company, but not interested in energy issues generally, and see little likely value in EE actions</p>

Agenda

Context

Summary of Residential Research

Residential Sector Findings

Summary of Non-Residential Research

Non-Residential Sector Findings

Next Steps

Appendix

Non-Residential Market Research Sample Design

- EnerNOC defined unique sample matrices for each customer sector
 - The non-residential market research sample matrix defined 124 cells which were defined by gas / electric use and building / business type
 - Specific sample completion targets were defined for each sample cell
- EnerNOC provided sample
 - Meters were first aggregated to business establishments (defined as a single business operating at a single physical location)
 - NOTE THAT the largest business establishments / enterprises were removed for separate analysis (using on-site surveys)
 - Non-Residential sample points were randomly selected and then parsed into two separate “tranches” (or draws)
 - Unfortunately, the total size of the sample universe did not allow for the targeted number of sample points to be selected in some sample cells; this shortage of sample made completing all of the targeted number of interviews in those cells very difficult

Non-Residential Market Research Surveys

- Non-Residential research involved two separate surveys
 - Just as with the residential sector, the Saturation survey focused primarily on appliance & equipment presence and use, while the Program Interest survey focused on reaction to new energy efficiency programs
 - For both surveys, due to the limited sample universe, all of the sample was mailed at once, with a postcard invitation requesting the respondent to complete an online survey; a second mailing was sent as a reminder increasing the incentive to \$50
 - Also, due to the limited sample universe, respondents to one survey were encouraged to respond to the other survey
 - Those completing the survey received a \$25 payment
 - Due to the small universe size, a variety of methods were used to enhance response, including additional phone calls, email, and outreach by Ameren Illinois staff
- Sample targets were met with this customer sector
 - 692 valid Saturation surveys have been received to-date for a net response rate just under 10%
 - 603 valid Program Interest surveys have been received to-date for a net response rate of just under 10%

Non-Residential Market Research Survey Weighting

- The sample design for both surveys used a disproportionate sample design
 - This means that some sample cells were surveyed at a higher rate than their natural incidence in the population
 - This occurs most commonly in sample cells that are important for analysis purposes (they are high energy users, for example) but where there are relatively fewer people in those cells
 - In these cases, we intentionally sample more of these respondents than we would get with a simple random sample
 - This is a common approach to sample design when there are analytically important, but lower population parts of the population
- Sample weights were used to bring the final database back into proportion and so that it “looks like” the original population
 - The sample design matrices were used to define the required sample weights

Agenda

Context

Summary of Residential Research

Residential Sector Findings

Summary of Non-Residential Research

Non-Residential Sector Findings

- **Highlights of Likely Program Adoption Rates**

Next Steps

Appendix

Estimating Likely Takers

- Survey respondents were asked about the likelihood that they would participate in each of 34 different energy efficiency / conservation programs
 - 13 programs involved providing rebates to acquire higher than standard efficiency cooling systems, heating systems, VSDs, motors, etc.
 - 7 programs that had to do with acquiring / upgrading elements of an energy management system, such as a programmable thermostat, daylight sensors, timers, and the like
 - 10 programs had to do with acquiring smaller scale equipment (e.g., PCs or servers) or providing incentives for more regular maintenance or inspection and repair
 - A separate assessment of EE lighting
 - 3 energy conservation programs that did not require additional investment

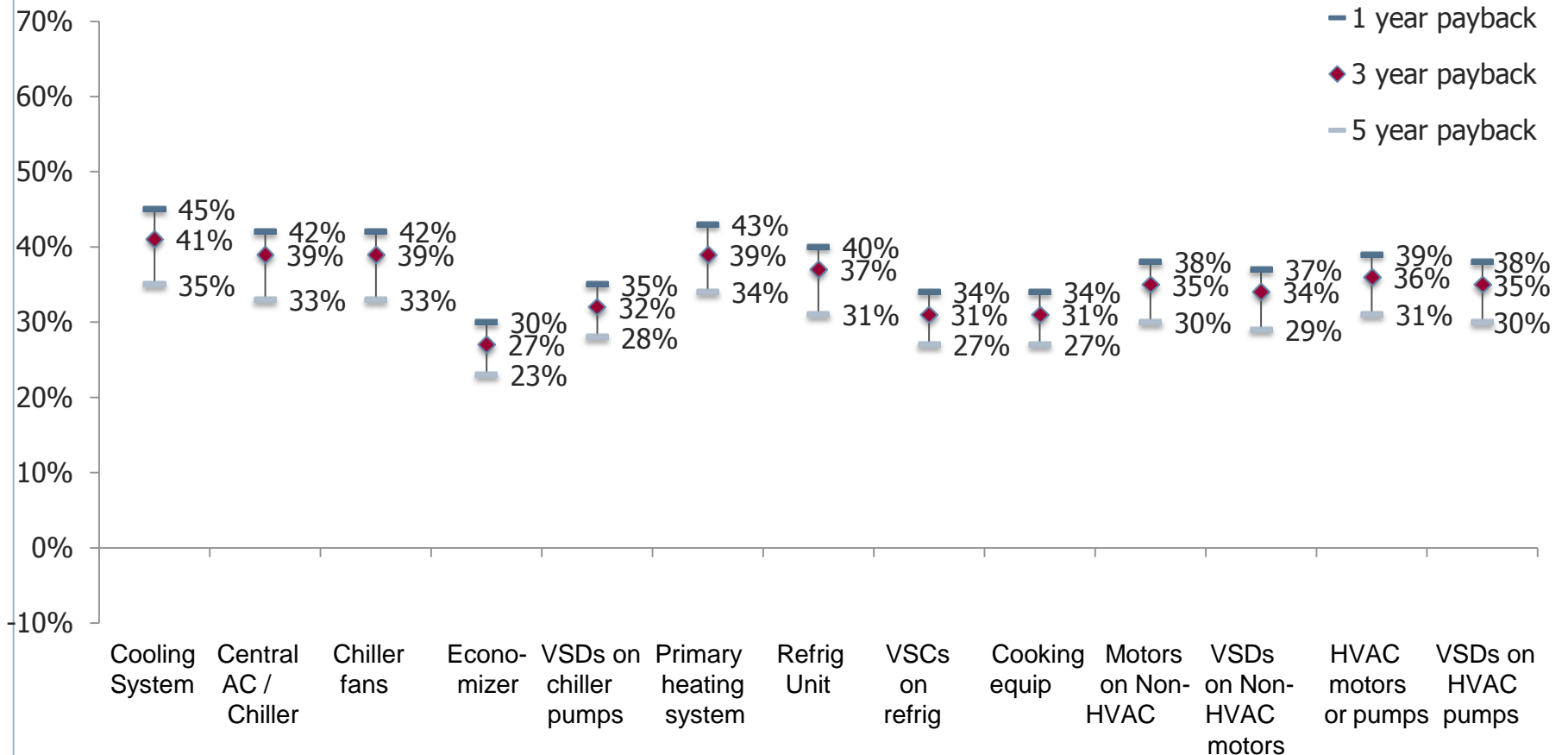
Estimating Likely Takers

- For each of the 31 incentive-related programs, the team captured information on the respondent's stated likelihood that they would adopt this measure either immediately on offer, or at appliance end of life (as appropriate)
 - Stated likelihood to adopt was reported for each measure on a “1” to “10” scale where “1” was labeled as “Not At All Likely To Do This,” and “10” was labeled as “Extremely Likely To Do This”
 - The team captured this information in a way that allowed us to estimate likelihood to adopt ratings for each of three payback periods (where appropriate) – 1, 3, and 5 year paybacks

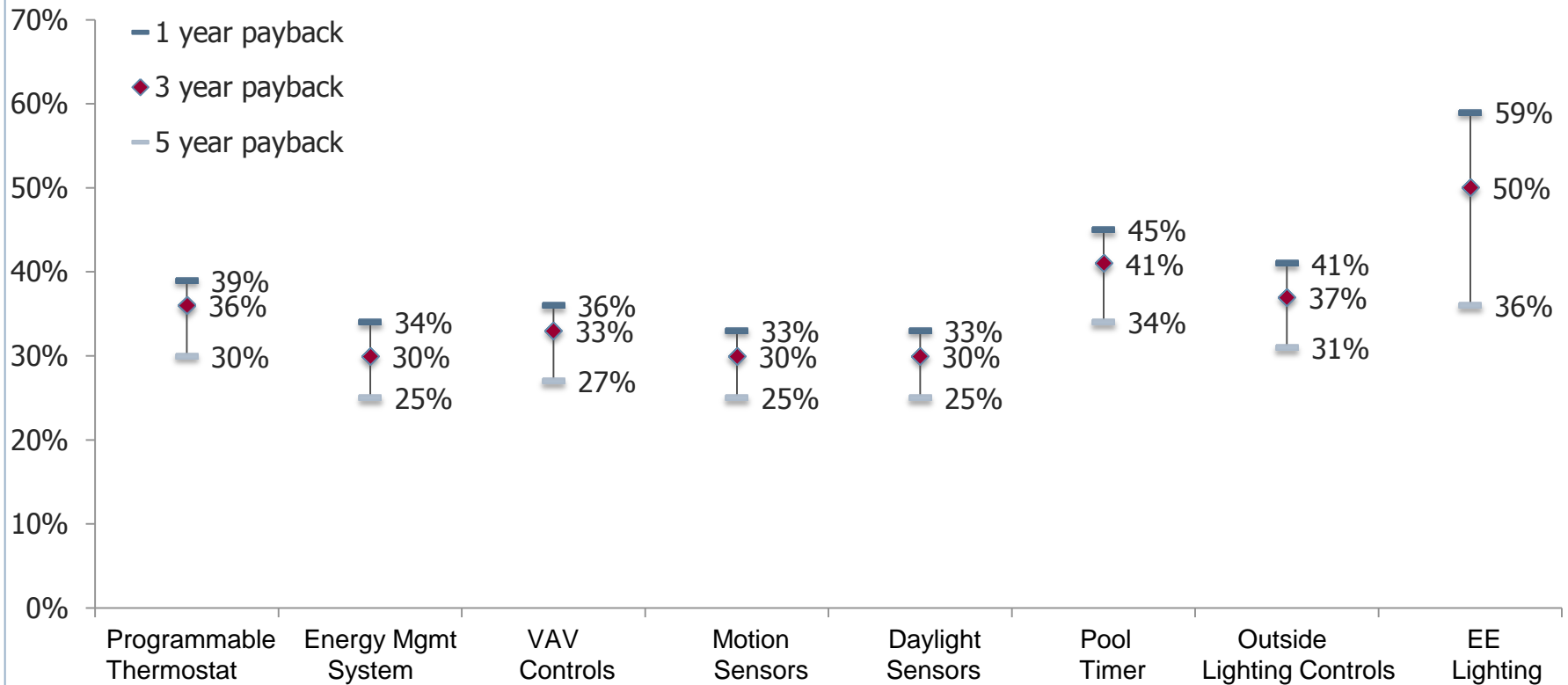
Estimating Likely Takers

- Initial customer responses were then adjusted to account for the “say / do” overstatement issue
 - This issue refers to the fact that – for multiple reasons -- survey respondents tend to overstate the likelihood that they will take a future action, and specifically to “buy” (or adopt) a new product or service
 - The logic used to make these adjustments is based on proprietary research conducted by YGDI and deflates the stated likelihood that a given customer will adopt a given measure by a percentage that depends on the rating they provided for that program, on their level of familiarity with the product category (in this case, energy efficiency), and with the regularity of their purchase
 - In this work we counted lighting purchases as more “regular” (i.e., more often than once a year, and used a different adjustment factor for this category)
 - The “likely taker” values reported in the remainder of this document represent these “adjusted” values
- See the appendix for these adjustment values

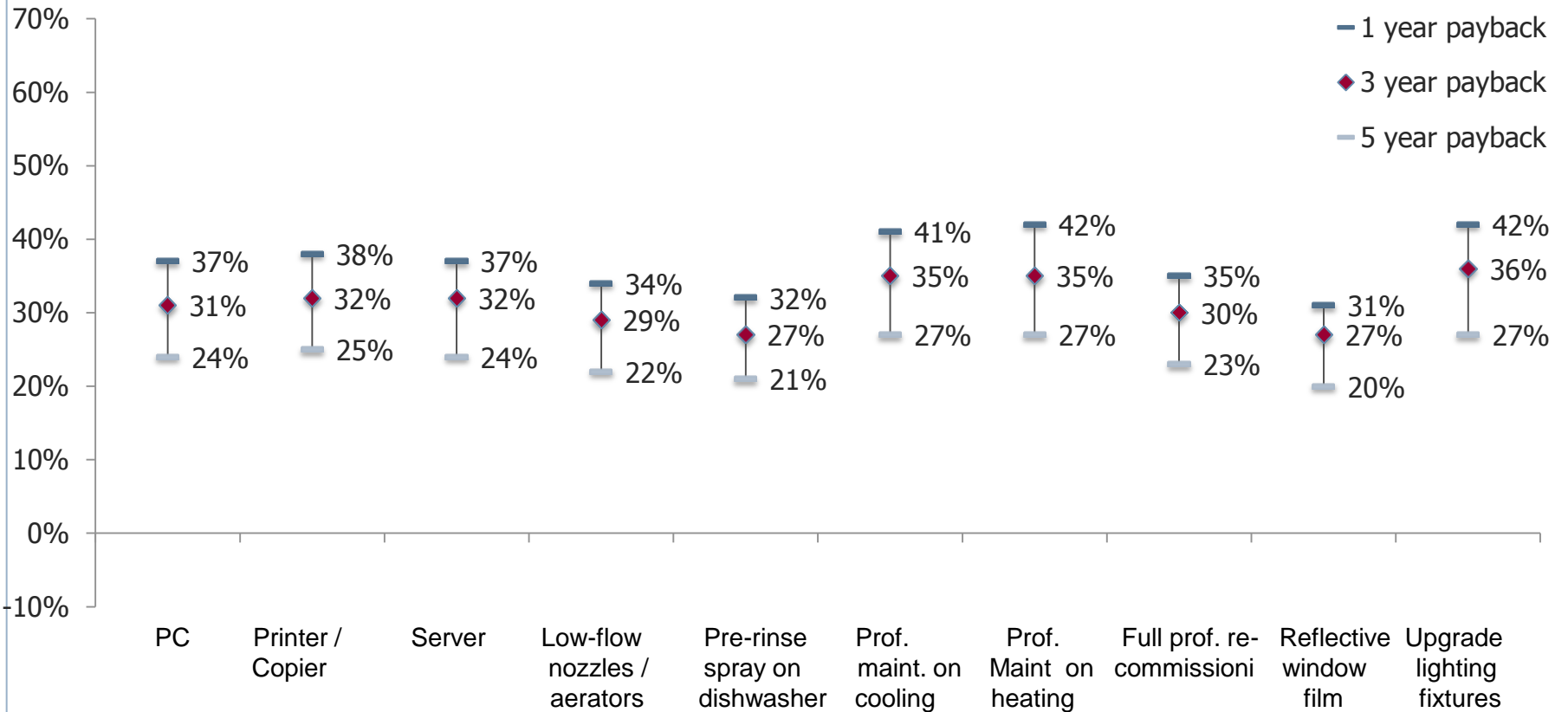
Likely Takers by Payback Period – EE Equipment (Total C&I)



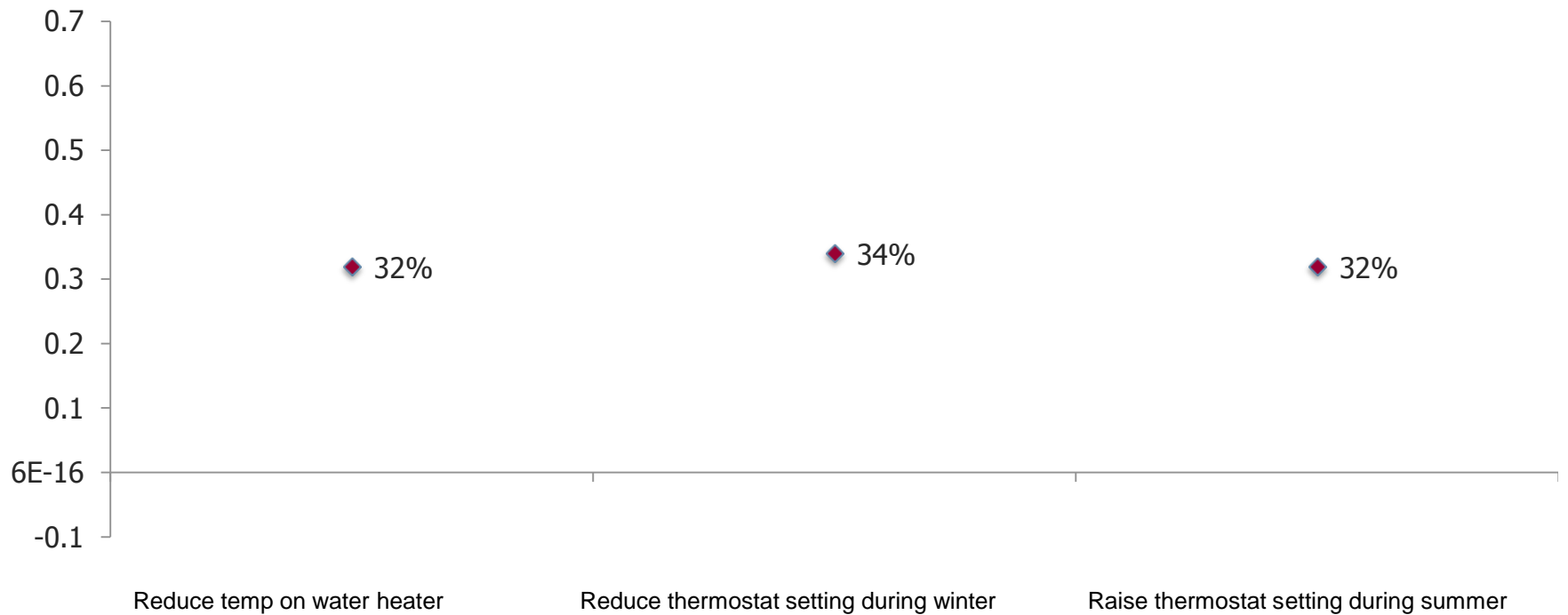
Likely Takers by Payback Period – EE Measures (Total C&I)



Likely Takers by Payback Period – EE Measures (Total C&I)



Likely Takers – Behavior (Total C&I)



Agenda

Context

Summary of Residential Research

Residential Sector Findings

Summary of Non-Residential Research

Non-Residential Sector Findings

Next Steps

- **Complete C&I Program Interest surveys**
- **Analyze C&I saturation survey data**
- **Finalize C&I take rates**
- **Develop C&I segmentation**

Appendix

Agenda

Context

Summary of Residential Research

Residential Sector Findings

Summary of Non-Residential Research

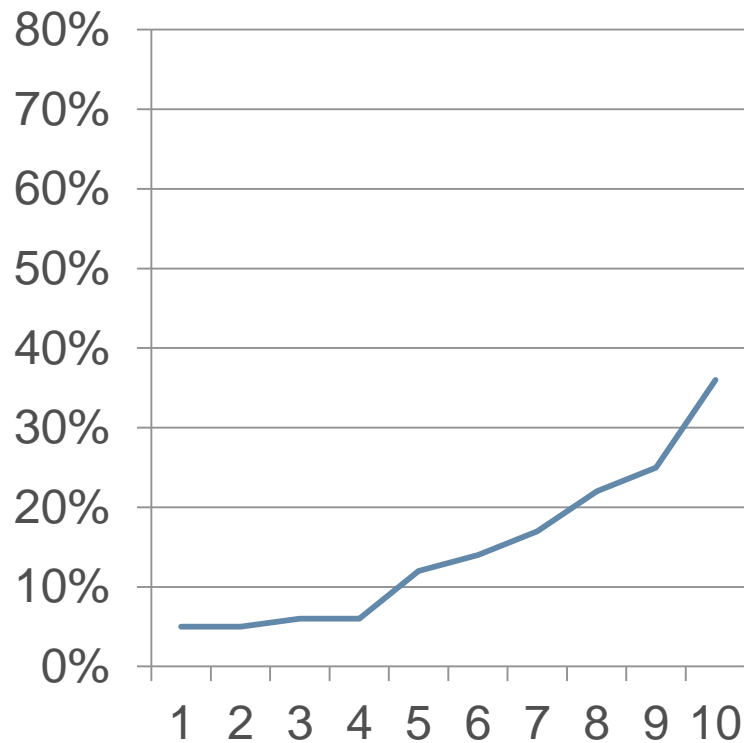
Non-Residential Sector Findings

Next Steps

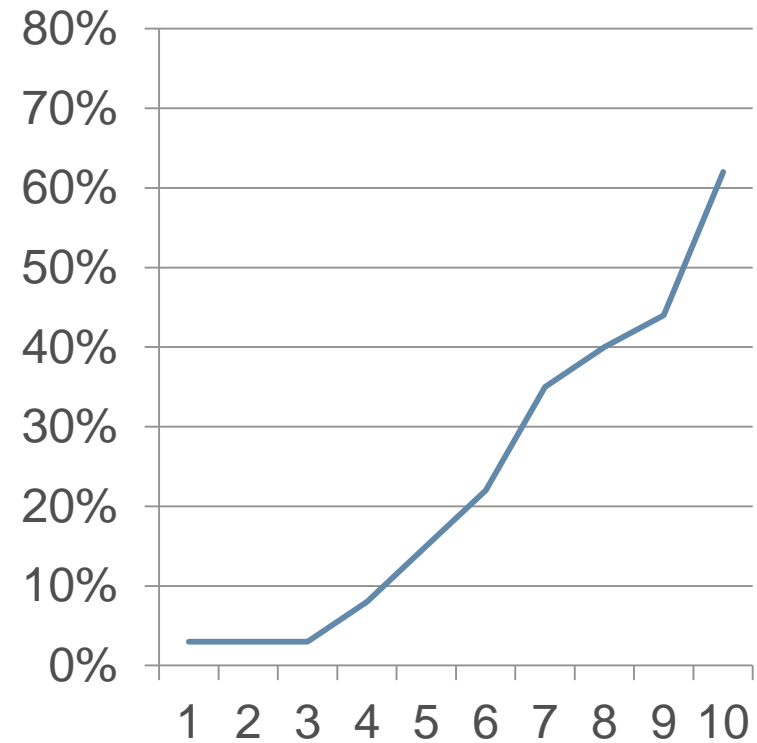
Appendix

Say / Do Adjustment Values For Residential

Say / Do Adjustment for IRREGULAR Purchases



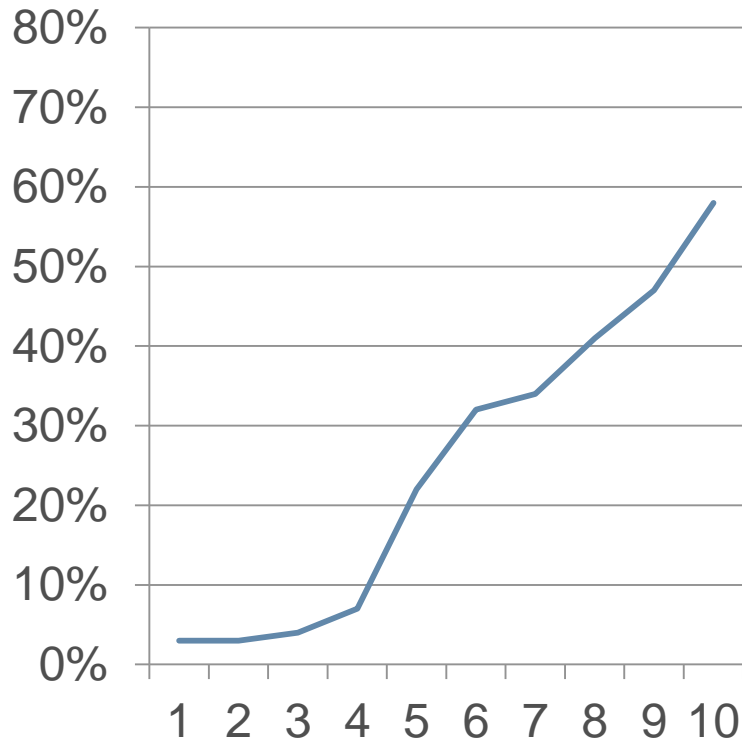
Say / Do Adjustment for REGULAR Purchases



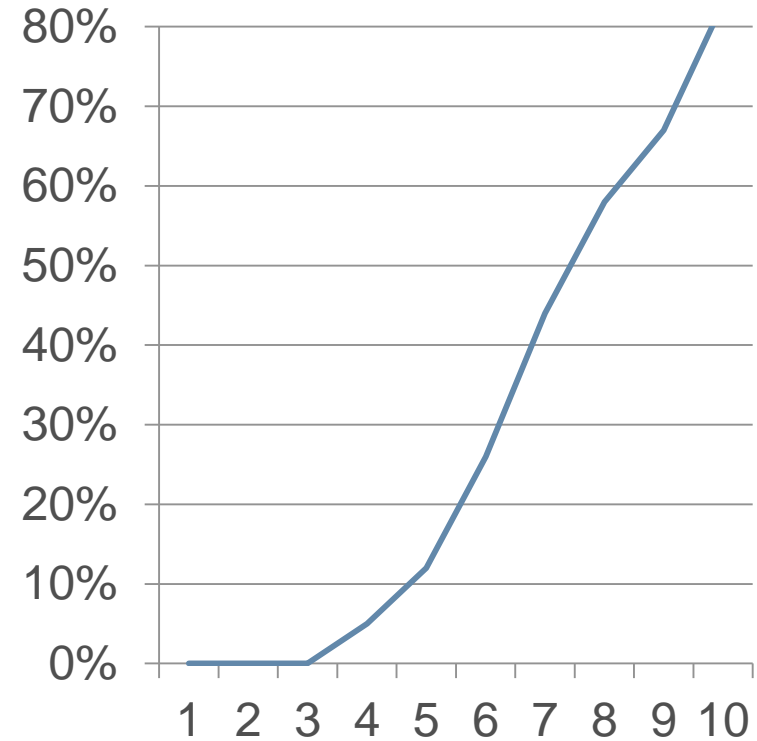
Note: This adjustment also accounts for information level, with more informed respondents having smaller adjustments applied and less informed respondents having higher adjustments applied

Say / Do Adjustment Values For Non-Residential

Say / Do Adjustment for IRREGULAR Purchases



Say / Do Adjustment for REGULAR Purchases



Note: This adjustment also accounts for information level, with more informed respondents having smaller adjustments applied and less informed respondents having higher adjustments applied

Residential Segment Overview

Practical Idealists (30%)

- Concerned with conserving energy, both from a cost-focus and an environmental perspective (they are the “greenest” segment)
- They are tech and feature oriented when considering appliances, but they also say they research options and compare prices.
- Higher education and income, and with the largest homes (though with only average total annual kWh usage)

Cost-Focused Conservers (15%)

- Informed about, and interested in, conservation / EE measures, but for cost reasons rather than environmental reasons.
- Believe in the value of EE as a way to save money, and has taken many prior EE actions.
- Do not trust Ameren Illinois very highly, however, and do not see it as the job of the company to encourage customers to save energy or money.
- They would prefer the company reduce rates than spend money on EE or green options.
- They have higher than average education and income levels, and the second largest homes on average, and the second highest average kWh.

Residential Segment Overview (cont.)

Willing, But Uninformed (15%)

- This group is positive in its assessment of Ameren Illinois, and green in their environmental perspectives (though this is not a daily, top-of-mind issue).
- Less experienced with EE / conservation measures to-date, and unsure of what they could be doing in this area, or if any of their actions would actually lead them to save money.
- Prefer simple, functional appliances that are on sale, and which they can purchase locally, rather than online.
- Average size homes and average annual kWh usage, as well as have lower than average income and education levels.

Willing, But Challenged (15%)

- Relatively high opinions of Ameren Illinois, and believe that the company should be pursuing EE options for its customers, while also supporting green initiatives.
- They are relatively low on EE / conservation information currently, however, and have implemented fewer such measures than others to-date.
- Appliance cost is critical to them and it appears that they do not think that they can afford to purchase higher quality / higher EE appliances.
- They live in the smallest homes, and have lower than average income and education levels, as well as the lowest annual kWh usage.

Residential Segment Overview (cont.)

Comfort Focused (10%)

- Are quite positive in its overall assessment of Ameren Illinois, but does not see the company as a leader in energy efficiency, nor do they think the company should be a leader in this area (i.e., in encouraging customers to be more efficient), or in green energy. Rather, the company should just focus on keeping costs low.
- Comfort is important, and they just want to be left alone to use energy as they please.
- They are concerned about appliance cost, but worry more about functionality (particularly as this relates to comfort) than about environmental / energy saving considerations.
- They tend to live in average sized homes, but have the highest annual kWh levels, along with higher than average incomes and education.

Low Interest, Little Action (16%)

- They actively dislike Ameren Illinois, rate it low particularly on trust and being a leader in EE.
- They do not want the company to encourage customers to save energy, nor do they want it to pursue green options.
- They do want the company to keep costs low as its sole focus.
- They have smaller than average homes, but average kWh levels, and are more likely to live in multi-family structures and to have somewhat lower levels of education and income.