

# Future Outlook for Residential Energy Management Research

*DR11SCE1.11 Report*



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## ABBREVIATIONS AND ACRONYMS

CABA	Continental Automated Buildings Association
DR	Demand Response
HEMS	Home Energy Management System
HVAC	Heating Ventilation and Air Conditioning
IHED	In-Home Energy Display
MPG	Miles Per Gallon
SCE	Southern California Edison
SoCHM	State of Connected Home Market Study

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## EXECUTIVE SUMMARY

Southern California Edison (SCE) wants to understand residential customers' interest in a number of smart grid-related products and services as well as the opportunities and barriers for smart grid products and services from the perspectives of manufacturers and members of the supply chain.

SCE conducted a two-pronged research study including a web survey among residential customers and twelve in-depth telephone interviews among industry decision-makers and thought-leaders. SCE's study leveraged the broader, national effort performed by the Continental Automated Building Association (CABA) as part of the 2011 State of the Connected Home Market (SoCHM) Energy Ecosystem survey. The SoCHM study was used to help inform SCE's survey approach, as well as to draw parallels to the national residential market.

The objectives of conducting the consumer web survey include:

1. Determine SCE customers' awareness, understanding of and response to smart grid concepts, including smart appliances, fault detection and diagnostics, dynamic pricing, energy efficiency programs, and demand response programs.
2. Determine SCE customers' likelihood to purchase energy-efficient smart appliances such as air conditioners and refrigerators, as well as in-home energy display systems for their home with and without fault detection capabilities.
3. Gauge SCE customers' likelihood to pay for an In-Home Energy Display (IHED).
4. Evaluate importance placed upon data privacy concerns.
5. Compare and contrast relevant findings with the CABA 2011 SoCHM Energy Ecosystem survey of US consumers.

The objectives of conducting phone interviews with the industry leaders were to:

1. Understand manufacturers view point on customers drive to manage energy.
2. Identify the benefits and barriers of smart grid technology.
3. Understand short- and long-term projections of smart grid products and services offered to customers.
4. Understand security issues, such as customer privacy, in implementing smart grid products and services.
5. Understand the current standard of communication protocol, and to gauge interest of vendors, manufacturers, and supply chain in creating a universal protocol for such devices.
6. Gauge manufacturer's interest in offering products with self-diagnostic capabilities to aid energy savings.

To achieve these objectives, a web survey of 606 residential customers was conducted in SCE service territory and 12 in-depth interviews were conducted with industry leaders who represent manufacturers, vendors, and supply chain distributors for smart grid products and services.

Insights from these studies will help inform SCE's planning for energy management initiatives targeting residential customers. The findings and conclusion of each phase,

consumer web survey and industry interviews, are listed in sub sections of this executive summary.

## RESIDENTIAL CUSTOMER SURVEY

In this web survey, 606 residential customers reviewed concept descriptions then answered questions about the Demand Response and Energy Efficiency concepts, along with answering socio-economic profiling and other questions. The web survey focused on residential customers who have air conditioning and are in a position to effect change to their air conditioning and/or other systems. See Appendix A for the questionnaire.

### KEY FINDINGS FROM THE WEB SURVEY

- Awareness and usage of energy conserving products, services, and utility programs is variable. Once informed, interest is notable:
  - Dynamic Pricing: strong awareness (74%), few subscribers (4%).
  - Demand Response: 28% want to learn more.
- Relatively small proportions, about 33% or fewer, participate in any single utility-sponsored program.
- Ninety-seven percent (97%) of SCE customers manage energy to save money.
- Many have taken easy and less expensive steps towards conserving energy.
  - Many own Energy Star appliances (71%), programmable thermostats (59%), and energy-efficient lighting (57%).
  - Some plan to replace appliances with smart dishwashers (41%), smart refrigerators (39%), and high efficiency air conditioners (35%) among others.
- Home Energy Management System: modest awareness (56%), few users (2%).
- In-Home Energy Display: 42% interested in using an IHED. If available, almost half (46%) might take a free IHED, 39% might pay \$49, 25% might pay \$99 and 12% might pay \$199.
- Use of effective but costly solutions like high efficiency cooling is relatively low (22%), but incremental gains can be expected.
- A few expect to add high efficiency cooling (6%), and heating (5%) systems within 12 months. Assuming this upgrade rate is consistent over time, a notable proportion of the base will eventually upgrade.

### FINDINGS LEAD TO FOLLOWING RECOMMENDATIONS

The following recommendations allow SCE to promote behavior that helps their customers to manage energy and save money.

- Customer Education – Customers need to learn about the benefits of managing energy in addition to the potential financial rewards. Place emphasis on end-user benefits like comfort and convenience. Major areas that need focused are:
  - Dynamic Pricing

- Demand Response
- Home Energy Management System (HEMS)
- IHED
- Although the awareness in these areas is low, customers show promise in adopting these technologies when they are well informed. For example, 28% customers want to learn more about dynamic pricing and 42% are interested in using IHED devices etc.
- Focus on products that are inexpensive and easy to use – customers expect a great user experience and prefer to save, not spend, money.
- Near-term Targeting: Riverside and San Bernardino counties may represent near-term opportunities.
  - In these counties homes tend to be newer and have higher cooling bills. Therefore, upgrades may be easier to justify financially.
  - Customers in these counties indicate greater likelihood to try SCE's programs and are more likely to plan high efficiency air conditioning upgrades compared to others.
- Targeting going forward: targeting by county, zip code, or gross level demographics may be rather coarse. Segmenting customers by needs, attitudes, and/or behaviors should be more effective in getting the most appropriate messages to the most receptive customers.
  - Identify segments that are ready to adopt now, and develop correlate messages.
  - Develop innovative outreach tools including social media.

## INDUSTRY INTERVIEWS

Twelve one hour-long telephone interviews were conducted in October and November 2011 among thought-leaders and decision-makers from major corporations with a stake in growing the smart grid.

Because this research is qualitative, findings should be construed as directional in nature.

## INTERVIEW KEY FINDINGS

- Consumers have a cursory understanding of the purpose of and benefits derived from the smart grid. They don't understand energy in a broad sense, including the purpose of and benefits derived from the smart grid, and how their behavior impacts energy consumption.
- Home energy management products and services on their own are likely to achieve limited penetration – bundling them with entertainment, security, and home automation services may increase penetration.
  - Note that in the CABA SoCHM study, a bundle of consumer services like this generates low demand, probably due to perceived complexity and cost. This underscores the need for an affordable bundle that is easy to understand.
- Consumers prefer to expend little effort to manage energy consumption but want the benefits. Thought-leaders suggest identifying products and services that are

easy-to-use, require little user intervention, and adapt to or learn from the user – these support the principle of convenience.

- Customer support may be balkanized along product and service lines, suggesting a frustrating customer experience of “finger pointing” when issues are not easily attributable to a single device or service.
- Innovation will help move conservation forward – options like pre-paid energy bills, novel conservation programs, contests, social media, etc., will build awareness, enthusiasm, engagement, and cooperation.
- Thought-leaders urge an open, non-proprietary standards-based approach regarding communication across devices and service providers. Continued debate and indecision on standards and protocols essentially stalls the smart grid ecosystem. Most advocate for open standards.
- Customer privacy is of significant concern to industry and consumers alike. Thought-leader consensus is that data should be owned by the customer, permission to use customer data must be explicitly granted, and data must be strongly protected with transparent policies surrounding ownership, access, and protection.
- Competing interests sense opportunity in the consumer energy market. Should utilities “go slow,” resist innovation, or otherwise take a minimalist approach to the smart grid and home energy management, other entities will try to control the customer relationship. Thought-leaders say such entities can then sell products and value-added services to customers, cutting utilities out of that revenue.

## FINDINGS LEAD TO FOLLOWING RECOMMENDATIONS

- Focus on customer education and inform customers of the benefits derived from energy conservation and use of smart grid products and services. Education - focused communications should include tangible and desirable benefits the smart grid can deliver. Use social media, etc., to gain consumer cooperation and build awareness, engagement, and enthusiasm.
- Utilities should focus on creating innovative financial incentives – they must be part of the mix of consumer-oriented incentives. Consider pre-paid billing along with demand response and dynamic pricing. Create novel conservation programs and contests with incentives to participants. Adopt the Brazilian model of going into neighborhoods during evenings and weekends for impromptu home energy audits, light bulb exchanges, etc.
- Partner with communication, entertainment, and security companies so SCE can bundle energy conservation services and tools with other consumer services.
- Make certain customer support is designed with the customer in mind – provide a single point of contact equipped to resolve issues involving multiple service providers and many devices.
- Advocate for two tiers of appliance remote diagnostics – a basic free “value-added” service, and a more robust “for pay” service for households where cost is not an issue.
- Segment customers by needs, attitudes, and behaviors regarding energy conservation; likely adoption of smart grid, HEMS, etc. This can be accomplished with custom proprietary market research.



- Bring to market inexpensive and easy-to-use devices. Such devices enjoy greater penetration than costly ones as they are easy to use and deliver convenience.
- Aggressively push for non-proprietary and open standards-based approach to communication across devices and service providers.
- Cede ownership of customer data to the customer. Protect data according to contemporary best practices, with transparent policies surrounding data ownership and protection.

Both phases of the study target opposite ends of the spectrum for smart grid products and services. However, both consumers and the industry have a message in common— customer education. Utilities will achieve more success in penetrating smart grid products to achieve higher efficiency and grid reliability if the customers are well informed of the uses and benefits of such devices. Utilities will also benefit by helping to bring down the cost of such devices. Expensive devices can get low traction from customers even if they are well informed and want to save energy. Make the benefit of smart grid products and services tangible by bringing them into the customers reach.

# INTRODUCTION

## BACKGROUND AND OBJECTIVES

Southern California Edison (SCE) is interested in understanding residential customer interest in a number of smart grid-related products and services, and at the same time, is interested in understanding opportunities and barriers for smart grid products and services from the perspectives of manufacturers and members of the supply chain.

SCE conducted a two-pronged research study including; a web survey among SCE residential customers and, twelve in-depth telephone interviews among industry decision-makers and thought-leaders.

The objective of conducting residential customer research includes:

1. Determine customers' awareness, understanding of, and response to dynamic pricing, energy efficiency, demand response programs, smart grid concepts, including smart appliances and fault detection and diagnostics..
2. Determine customers' likelihood to purchase energy-efficient smart appliances such as air conditioners and refrigerators, as well as in-home energy display systems with and without fault detection capabilities.
3. Gauge customers' likelihood to pay for an In-Home Energy Display (IHED).
4. Evaluate importance placed upon data privacy concerns.
5. Compare and contrast relevant findings with the Continental Automated Buildings Association (CABA) 2011 State of the Connected Home Market (SoCHM) Energy Ecosystem survey of US consumers.

The objectives of conducting phone interviews with the industry leaders were to:

1. Understand manufacturers view point on customers drive to manage energy.
2. Identify the benefits and barriers of smart grid technology.
3. Understand short- and long-term projections of smart grid products and services offered to customers.
4. Understand security issues, such as customer privacy, in implementing smart grid products and services.
5. Understand the current standard of communication protocol, and to gauge interest of vendors, manufacturers, and supply chain in creating a universal protocol for such devices.
6. Gauge manufacturer's interest in offering products with self-diagnostic capabilities to aid energy savings.

To achieve these objectives a web survey of 606 residential customers was conducted in SCE service territory and 12 in-depth interviews were conducted with industry leaders who represent manufacturers, vendors, and supply chain distributors for smart grid products and services. The SCE consumer survey parallels the aforementioned CABA-sponsored SoCHM survey of US consumers. This report includes and compares relevant findings from that survey

Insights from these studies will help inform SCE to plan energy management initiatives targeting residential customers.

# METHODOLOGY

## RESIDENTIAL CUSTOMER SURVEY

Research findings and survey data generalize to the online population of SCE residential customers who have air conditioning in their residence and can effect changes to their air conditioning and/or other systems

The survey, conducted November 2 – 14, 2011, included 606 residential customers that met the following criteria:

- 18+ years of age
- Solely, or jointly, responsible for paying energy bill
- Own or rent a residence with central air or window air conditioning units.
  - Renters must have authority to replace thermostat, replace appliances, and/or make changes to furnace or air conditioner.
    - No one in household employed in a competitive industry, marketing, or research.
- On average, the survey took about 21 minutes to complete and targeted a general cross section of customers based on gender, age, demographics, and employment status to achieve a representative sampling of SCE households.
- ResearchNow provided the online national consumer Web panel, with a margin of error of +/-4.4%. Customers were compensated for their participation, and data was weighted by household income to ensure that the targeted population was met. See Appendix C to review Web panel calculations and data.
- **Comparing data and findings across surveys:** Because SCE customers were qualified using a number of distinct criteria that differ from criteria used for the CABA SoCHM survey of US consumers, comparisons between the two data sets and surveys should be considered directional in nature. Notable differences in qualification criteria include:
  - Air conditioning – to qualify, SCE customers need to have central air conditioning and/or window air conditioning units, whereas US consumers do not.
  - Renters – to qualify, renters must be able to make changes to their HVAC system, replace or add major appliances like a dishwasher, refrigerator, or washer/dryer, whereas US consumers do not.
  - Geography – SCE customers are naturally located only in Southern California, whereas the US survey sample was drawn from across the United States.

### **Conventions used in the Residential Customer Web Survey report of findings:**

- Primary vs. Mass Market segments are referenced throughout the report, and are defined based on customer appeal ratings of the connected home as described in the survey. The segments are described in the Household Profile section. The connected home concept description is included in Appendix C.
  - Primary Market customers rate the appeal of the connected home a six or seven on a seven point appeal scale, meaning they find the connected home very appealing.
  - Mass Market customers rate their appeal between one and five, meaning they find the connected home less than very appealing.
- Letters in tables and graphs denote statistically significant differences between segments.
  - There is no significance testing between the SCE and US statistics given the differences in the sample characteristics.
- Stacked bar charts and summed totals in tables do not always equal 100% due to rounding.
- Unless otherwise noted, customers responding “Don’t know” or “Refused” are excluded from the base.
- In some tables and graphs, data is “netted,” meaning a number of related responses are “netted” under a single meaningful label. To provide readers with detail, the individual proportions that constitute the net are shown below the net and indented.
- Proportions in tables are based to the groups identified in column headings.
- In some cases, data are referred to in text that may be shown in Appendix C

## **INDUSTRY INTERVIEWS**

Twelve telephone interviews were conducted, each lasting about one hour, among thought-leaders and decision-makers from major corporations with a stake in growing the smart grid.

CABA provided a list of thirty contacts who were invited to participate in an interview, or refer someone within their company whom they perceived as well- or better qualified. Zanthus emailed contacts and scheduled appointments by email and telephone.

Interviews were conducted between October 10 and November 4, and included thought-leaders and decision-makers from the following companies:

- ADT
- Best Buy
- BSH Home Appliance Corporation
- Carbon Café Consulting
- General Electric Energy Services
- IBM
- Ken Wacks Associates

- Landis + Gyr
- Mahindra Satyam
- Ontario Privacy Commission
- Telus
- Sempra Utilities
- Shell

As a token of thanks for their cooperation, interviewees are to receive a summary report of findings from the research.

Because this research is qualitative, findings should be construed as directional in nature.

# SUMMARY OF FINDINGS

Note: Residential customer survey findings are generalized to the online population of SCE customers who have air conditioning and can effect changes to their air conditioning and/or other systems.

## RESIDENTIAL CUSTOMER SURVEY SUMMARY

- **SCE customers say the main motivation for saving energy is a lower bill (97%), but this does not necessarily translate into participation in utility-sponsored energy conservation programs.**
  - Participation in utility programs is relatively low – 31% participate in the SCE Summer Discount Plan, 29% in Energy Efficiency Programs, and so on.
  - On average, 34% say up to a 20% reduction in their bill would make IHED worthwhile (regardless of IHED price), the balance desire greater savings.
- **Awareness and usage of energy-conserving products, services, and utility programs is variable. Once consumers are informed, interest is notable:**
  - Dynamic Pricing: awareness is strong (74%), though few subscribe (4%). Up to 40% may switch to a dynamic pricing rate plan, and 24% are interested in learning more about it, indicating opportunity.
  - Demand Response: 28% are interested in learning more.
  - Home Energy Management System: modest awareness (56%), though few have one in their home (2%).
  - In-Home Energy Display: 42% are interested in using an IHED to reduce energy consumption. Furthermore, 46% will accept a free IHED, 39% are likely to pay \$49, 25% are likely to pay \$99, and only 12% are likely to pay \$199.
    - Customers evaluated IHED features (including automatic diagnostics and notification of maintenance needs) – no feature rated notably more important than others, with “at home/away/nighttime” settings and displaying real-time energy pricing nominally more important than other tested features. This would synchronize with the desire to use IHED to reduce energy consumption.
  - SCE customer participation in equipment maintenance and renewable/clean energy programs is the same as among US consumers, though many more customers participate in an energy management service that tracks and lowers energy bills compared to US consumers surveyed in SoCHM study.
- **Many have taken easy and less expensive steps towards conserving energy.**
  - Most take a self-managed approach to conservation (77%; e.g., turning off lights, turning down thermostat).
  - Many already own Energy Star appliances (71%), programmable thermostats (59%), and energy-efficient lighting (57%).

- The good news is that over time a notable proportion of customers expect to replace existing appliances with smart appliances, led by dishwashers (41%), refrigerators (39%), and air conditioners (35%) among others.
- More customers tend to own or plan to acquire smart appliances and energy-efficient devices than US consumers.
- **Use of effective but costly conservation solutions such as high efficiency cooling is relatively low (22%), but incremental gains can be expected over time.**
  - In the next year, a small minority will add high efficiency cooling (6%) and heating (5%). Assuming install rates remain reasonably consistent, a notable proportion of the customer base will upgrade over the next five to ten years.
- **There is opportunity due to low awareness** – this provides SCE with a relatively clean slate upon which to craft and articulate messages that educate consumers and stimulate conservation.

## INDUSTRY INTERVIEWS SUMMARY

Because this research is qualitative, findings are directional in nature.

**There are two critical barriers to the adoption of smart grid products and services in the consumer market:**

- 1) Manufacturers and service providers have not arrived at open and uniform standards and protocols,
  - 2) Consumers lack understanding about energy in a broad sense, including the purpose of and benefits derived from the smart grid, and how their behavior impacts their consumption of energy.
- **To mitigate these barriers, thought-leaders urge a non-proprietary and open standards-based approach regarding communication across devices and service providers.**
    - Thought-leaders say continued debate and indecision on standards and protocols essentially stalls the smart grid ecosystem.
    - Most advocate for open standards.
  - **Consumers at best have a cursory understanding of the purpose of and benefits derived from the smart grid – customer education is required.**
    - Education-focused communications should include tangible and desirable benefits the smart grid can deliver, like comfort and convenience.
    - Financial return from energy conservation is likely to be small or non-existent. Therefore, even as customers tell us cost savings is the most desirable benefit, it must be considered a secondary benefit.
    - Segment customers by needs, attitudes and behaviors regarding energy conservation, to facilitate messaging and targeting the likely adoption of smart grid, HEMS, etc.
  - **Thought-leaders say innovation will help move conservation forward –** they say options like pre-paid energy bills, novel conservation programs, contests, social media, etc., will build awareness, enthusiasm, engagement, and cooperation.
  - Thought-leaders contend that **consumers prefer to expend little effort to manage home energy consumption but they do want to reap the benefits.** They suggest identifying products and services that are easy-to-use, require little user intervention, and adapt to or learn from the user – these support the principle of convenience.
  - Home energy management products and services on their own are likely to achieve limited penetration – **bundling them with entertainment, security, and home automation products and services may increase penetration.**
  - Note, in the CABA SoCHM study, a bundle of services including TV, phone, Internet, home security, and home energy management generates low demand (e.g., 3% top two box likelihood to purchase, 19% discounted demand), most likely due to perceived complexity and cost. This underscores the need for an affordable service bundle that is conceptually easy to understand.
  - **Customer support may be Balkanized along product and service lines –** e.g., an appliance manufacturer supports its appliances, the thermostat manufacturer supports its device, and the energy utility resolves power issues.



This suggests that some customers will endure a frustrating service experience of “finger pointing” when service issues are not easily attributable to a single device or service.

- **Customer privacy is of significant concern to industry and consumers alike.** Thought-leader consensus is that the customer should own their data. Permission to use customer data must be explicitly granted by the customer, and data must be protected according to contemporary best practices. For example, transmitted as encrypted data stored on secure servers, personal behavioral and financial data separated from usage data, etc., with transparent policies surrounding data ownership and who has access to the data, and protection of the data.
- **Competing interests sense opportunity in the consumer energy market.** Should utilities “go slow,” resist innovation, or otherwise take a minimalist approach to the smart grid and home energy management. In so doing, other entities will try to seize the advantage and try to control the customer relationship. Thought-leaders say such entities can then sell products and value-added services to customers, cutting utilities out of that revenue.

# CONCLUSIONS AND RECOMMENDATIONS

## RESIDENTIAL CUSTOMER SURVEY

Consumers want to conserve energy – there are many steps SCE can take to promote this behavior.

- **Dynamic Pricing** – it makes sense to roll out dynamic pricing, but if it relies on smart appliances, HEMS, and so on, go slow until manufacturers and service providers agree on standards and protocols.
  - Most customers are neutral about investigating Dynamic Pricing, suggesting they do not see the benefit. This underscores the need for customer education.
- **Demand Response** – again, more are neutral about investigating DR, suggesting they do not see the benefit, and underscoring the need for education.
- **Education** – customers need to learn about the benefits of saving energy beyond the financial one – emphasize end-user benefits like comfort and convenience.
  - Foster understanding of the relationship between behavior and the energy bill so customers learn how consumption relates to costs.
  - Communicate the benefits of the smart grid in such a way that customers want to participate.
- **Focus on products that are inexpensive and easy-to-use** – customers increasingly expect a great user experience, and prefer to save money, not spend it.
  - Energy management devices that operate in the background and learn from customer behavior should be a better fit for customer lifestyles. The Nest Learning Thermostat is an example of this.
- **HEMS** – awareness is low, underlining the need to inform customers about the benefits derived from it. Nevertheless, with little downside to SCE, it makes sense to advance HEMS.
- **IHED** – customer interest in IHED shows promise and merits further development and research.
  - Customers vary in terms of the granularity of data desired, so providing choice in how usage data are reported is recommended.
  - Customers prefer energy usage to be expressed in dollars and not kilowatt hours – adopting customer-friendly language will help consumers interact with such devices.
- **Near-term Targeting:** Riverside and San Bernardino counties may represent opportunities in the near term.
  - Cooling bills are likely to be higher in the Inland Empire, suggesting greater potential for savings due to conservation efforts.
  - Homes in these counties tend to be more recently built. As reported in the SCE Zero Net Energy Buildings report of December 2010, new construction is more conducive to implementing energy savings upgrades compared to older construction.

- Customers in these counties tend to be more likely to try SCE's programs and more likely to plan high efficiency air conditioning upgrades compared to other counties.
- Upper income households are more likely to acquire these solutions, and arguably can afford more expensive solutions like high efficiency heating and cooling systems.
- **Targeting going forward:** targeting at the county level, by zip code or gross level demographics may be rather coarse. To drive awareness and adoption, thought-leaders urge SCE to "get closer" to its customer base by segmenting customers by needs, attitudes, and/or behaviors.
  - Identify customer segments that are ready to adopt solutions now, and develop messages that resonate with these segments.
  - SCE could purchase an "off-the-shelf" segmentation, or conduct its own market research to develop a custom segmentation.
  - Focus on lifestyle benefits like convenience and comfort along with the potential to save – but don't over-promise financial rewards.
  - Develop innovative outreach tools including use of social media.
  - A thought-leader mentioned a Brazilian example where local utility employees visit communities on weekends going door-to-door to conduct impromptu home energy audits. This is an example of a utility going to customers, and within a time window that may be more convenient than Monday through Friday during business hours.

As noted, thought-leaders advocate a customer segmentation approach to marketing and communication, as described in this quote:

*"Which of your consumers are likely to make these changes right now? And rather than blanket the whole (customer base) with an insert in their bill, how about if we just message to those consumers who we know can make those changes and how are they segmented? Not only by whether they have a smart meter or not, but is their lifestyle orientation something that they would then want to make these changes." Global Retailer*

## INDUSTRY INTERVIEWS

- **Focus on customer education** – inform them of the benefits they gain due to energy conservation and use of the smart grid products and services.
  - Emphasize end-user benefits like comfort and convenience, with cost savings as a secondary benefit.
- **Aggressively push for non-proprietary and open standards-based approach** regarding communication across devices and service providers.
- **Innovate:**
  - Take a creative approach to developing financial incentives.
  - Consider pre-paid billing along with DR and dynamic pricing.
  - Use social media, etc., to gain consumer cooperation and build awareness, engagement and enthusiasm.
  - Adopt the Brazilian model of going into neighborhoods during evenings and weekends for impromptu home energy audits, light bulb exchanges, etc.
- **Partner** with companies that add value to the home energy management equation so SCE can bundle energy conservation services and tools with other consumer services like entertainment, security, and home automation – this should help expand market penetration.
- **Promote and/or re-sell devices that are inexpensive and by design easy-to-use**, adapt to or learn from the user, and require little user intervention.
  - Inexpensive devices should enjoy greater penetration than costly ones.
  - Easy-to-use devices support the principle of convenience.
  - Develop mobile apps that are consumer friendly and easy-to-use.
- **Cede ownership of customer data to the customer.**
  - Protect data according to contemporary best practices, with transparent policies surrounding data ownership and protection.
- **Make certain customer support is designed with the customer in mind.** In other words, make certain the customer has a single point of contact that is equipped to address and resolve issues involving multiple service providers and myriad devices.
- Advocate for **two tiers of appliance remote diagnostics** – a basic free “value-added” service, and a more robust “for pay” service for households where cost is not an issue.
- **Review customer-facing initiatives to make certain they include customer benefits.**
  - Segment customers by needs, attitudes and behaviors regarding energy conservation, likely adoption of smart grid, HEMS, etc. This can be accomplished with custom proprietary market research, or by purchasing an “off-the-shelf” solution.

Both phases of the study target opposite ends of the spectrum for smart grid products and services. However, both consumers and the industry have a message in common— customer education. Utilities will achieve more success in penetrating smart grid products to achieve higher efficiency and grid reliability if the customers

are well informed of the uses and benefits of such devices. Utilities will also benefit by helping to bring down the cost of such devices. Expensive devices can get low traction from customers even if they are well informed and want to save energy. Make the benefit of smart grid products and services tangible by bringing them into the customers reach.

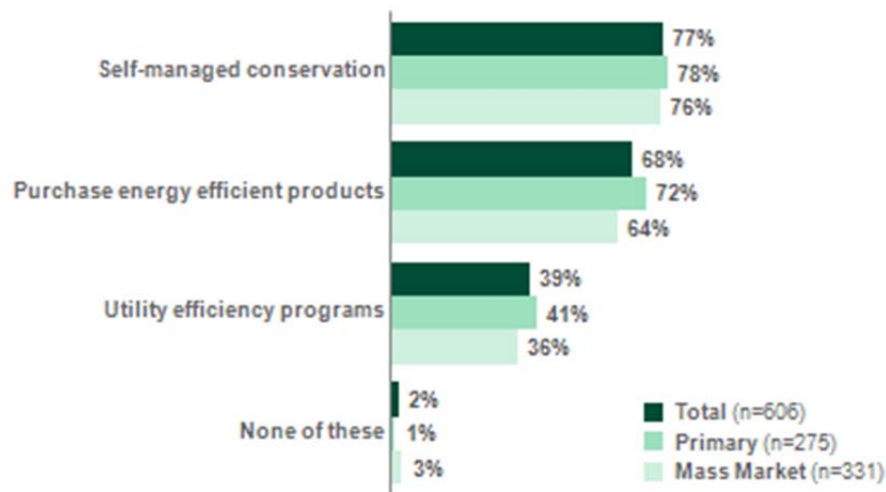
# APPENDIX A

## DETAILED FINDINGS RESIDENTIAL CUSTOMER WEB SURVEY

### HOUSEHOLD ENERGY PROFILE

#### HOUSEHOLD EFFORTS TO CONSERVE ENERGY

The survey asked customers what their individual efforts were to conserve energy. See Figure 1 for their response.



**FIGURE 1. HOUSEHOLD APPROACHES TO REDUCING ENERGY CONSUMPTION<sup>1</sup>**  
**Q14\_1 MULTIPLE RESPONSE ALLOWED, BASE N=606**

- Almost all customers take action regarding reducing energy consumption (98%). The most common approach is self-management of energy conservation (77%).
- Fewer than 39% of the customers surveyed, participate in energy efficiency programs sponsored by their utility company.

Differences between primary and mass-market segments are negligible.

- Table 1 captures the energy-consuming measures used by residential customers, by county.

<sup>1</sup> Primary vs. Mass Market segments are defined based on customer appeal ratings of the connected home as described in the survey. Primary Market customers find the connected home concept very appealing, while Mass Market customers find it less than very appealing. The segments are described in the Household Profile section.

**TABLE 1. HOUSEHOLD APPROACHES TO REDUCING ENERGY CONSUMPTION BY COUNTY\*  
Q14\_1 MULTIPLE RESPONSE ALLOWED, BASE N=606**

	Total	Counties					
		LA	Riverside	S Brnrdrno	Orange	Ventura	Other*
		(A)	(B)	(C)	(D)	(E)	(F)
Self-managed conservation	77%	72%	79%	77%	80%	78%	<b>91% B</b>
Purchase energy efficient products	68%	70%	71%	61%	62%	71%	80%
Participate in efficiency programs	39%	35%	<b>58% BDE</b>	33%	33%	40%	48%
None of these	2%	3%	1%	0%	2%	2%	0%
Base	606	222	96	75	132	55	26

Differences by county:

- Riverside: 58% participate in energy efficiency utility programs, and 37% use all three approaches, more than other counties (data not shown).
- Almost all in "Other" counties take the self-managed approach.
- San Bernardino: 32% self-manage conservation and take no other action, a greater proportion than other counties.

Demographic differences (data not shown):

- Less than \$50,000 household income: 32% self-manage conservation alone, more than other income segments.
- Greater than \$150,000: 36% takes all three steps, more than other income segments.

\* Indicates small cell size; results should be considered directional.

Sub- and superscript letters in tables and graphs denote statistically significant differences between segments. In the table above, Riverside County responses for "Participate in efficiency programs" are statistically different from responses in columns BDE, or responses from LA, San Bernardino, and Orange Counties.

Stacked bar charts and summed totals in tables do not always equal 100% due to rounding.

**TABLE 2. PERMUTATIONS OF HOUSEHOLD APPROACHES TO REDUCING ENERGY CONSUMPTION**

Table 2 illustrates the possible permutations of approaches and the proportion of customers taking those approaches:

Permutations of Approaches	Total
Purchase energy efficient products + Self-manage conservation	25%
Participate in efficiency programs + Purchase energy efficient products + Self-manage conservation	25%
Self-manage conservation ONLY	24%
Purchase energy efficient products ONLY	10%
Participate in efficiency programs + Purchase energy efficient products	6%
Participate in efficiency programs ONLY	4%
Participate in efficiency programs + Self-manage conservation	2%
None of these	2%
Total	100%
Base	606

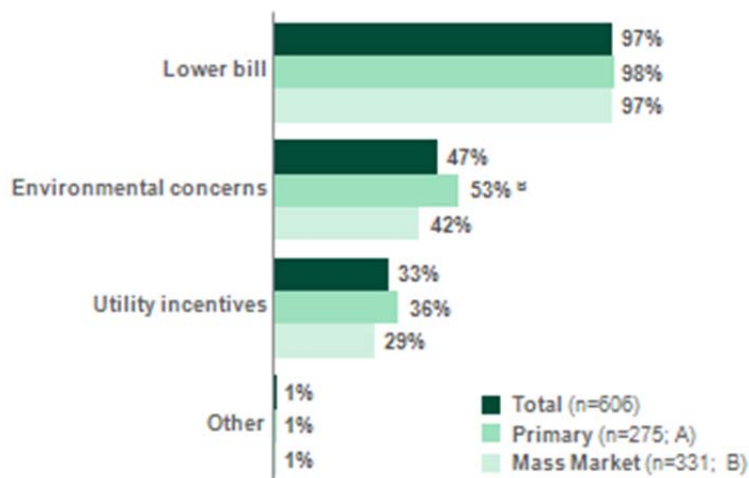
The top three permutations include self-managed conservation, including 24% who take only that approach. One-in-four (25%), take all three approaches.

Roughly, equal proportions take all three approaches (25%), try both self-managing and purchasing energy efficient products (25%), or rely exclusively on self-management (24%).

#### MOTIVATIONS FOR ENERGY CONSERVATION

Customers were asked to provide their motivation to save energy in the survey. They were provided several options that can be perceived as motivation to save energy. Results of this exercise are provided in Figure 2.





**FIGURE 2. MOTIVATIONS FOR ENERGY CONSERVATION**  
**Q14\_2 MULTIPLE RESPONSE ALLOWED, BASE N=606**

- For most customers, reducing the energy bill is the most common motivation for conserving energy.
- Primary customers are significantly more likely to cite environmental concerns compared to the mass market.
- Results from Figure 2 were divided by county in Table 3 to provide a better picture of SCE service territory.

**TABLE 3. MOTIVATIONS FOR ENERGY CONSERVATION BY COUNTY\***  
**Q14\_2 MULTIPLE RESPONSE ALLOWED, BASE N=606**

	Total	Counties					
		LA	Riverside	S Brnrndno	Orange	Ventura	Other*
	(A)	(B)	(C)	(D)	(E)	(F)	(G)
Low er bill	97%	98%	96%	94%	98%	<b>100% CD</b>	<b>100% CD</b>
Environmental concerns	47%	49%	46%	43%	49%	46%	45%
Utility incentives	33%	30%	37%	29%	35%	40%	31%
Other	1%	0%	3%	0%	0%	2%	0%
None of these	0%	0%	0%	0%	0%	0%	0%
Base	606	222	96	75	132	55	26

- Riverside, Orange, and Ventura counties are directionally more likely to respond to utility incentives compared to other counties.

\* Indicates small cell size; results should be considered directional.

**TABLE 4. PERMUTATIONS OF MOTIVATIONS FOR ENERGY CONSERVATION**

Permutations of Motivations	Total
Lower monthly bill ONLY	41%
Environmental concerns + Lower monthly bill	24%
Environmental concerns + Utility-sponsored incentive program + Lower monthly bill	21%
Utility-sponsored incentive program + Lower monthly bill	11%
Environmental concerns ONLY	2%
Utility-sponsored incentive program ONLY	0%
Environmental concerns + Utility-sponsored incentive program	0%
Other	1%
None of these	0%
Total	100%
Base	606

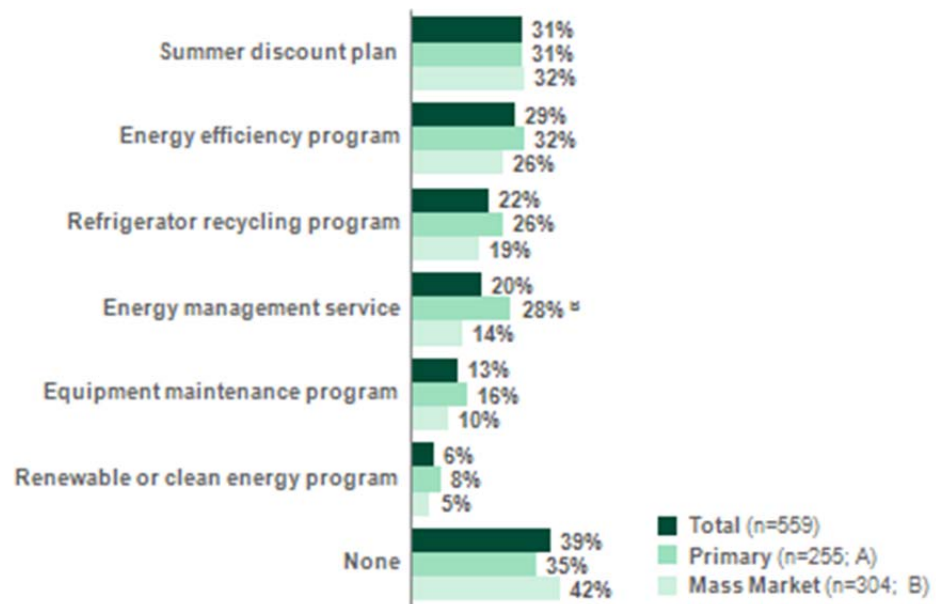
- A substantial group (41%) is motivated only by reducing their bill, again underscoring the importance of financial incentives as motivation for saving energy.
- Few, if any, are motivated only by environmental concerns, or utility-sponsored incentives.

Segment differences:

- Age:
  - 35-54 year olds: 50% are motivated solely by reducing the bill, more than most other segments.
  - 55+ year olds: 6% are motivated by environmental concerns alone, more than the other age segments.
- High school education or less: 50% are motivated solely by reducing the bill.
- Homeowner income greater than \$150,000: 32% are motivated by all three options, more than other segments.

## ENERGY PROGRAM PARTICIPATION

Customers were surveyed to identify their interest and level of participation in energy efficiency programs offered by SCE. The results are shown in Figure 3.



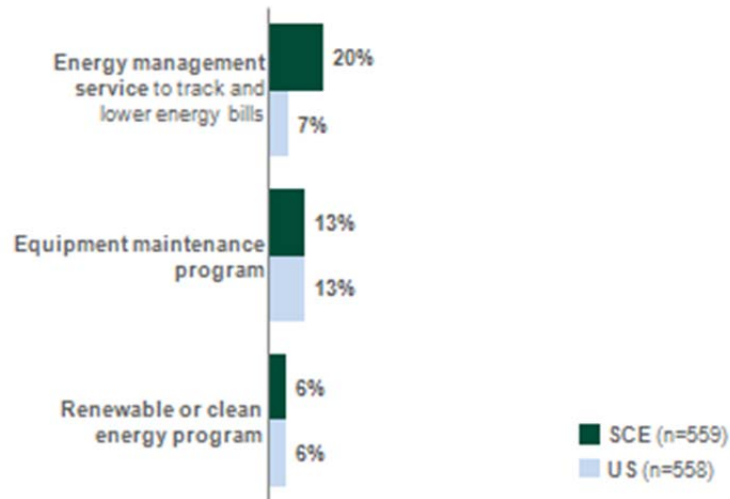
**FIGURE 3. ENERGY PROGRAM PARTICIPATION**  
Q755, BASE N=559

- Cumulatively, 6 in 10 (61%) customers, participate in one or more energy programs.
- However, each program individually attracts fewer than 1 in 3 customers. If increasing participation in such programs aligns with SCE corporate objectives, improving customer education, outreach, and the programs themselves are warranted.
- The summer discount plan and energy efficiency program achieve participation among nearly 1 in 3 customers (31%).
- One-in-five have recycled a refrigerator as part of a recycling program (22%).
- Primary market customers are twice as likely as mass market to use energy management services, suggesting primary market customers are more willing to work with SCE to conserve energy.

**TABLE 5. ENERGY PROGRAM PARTICIPATION BY COUNTY**

	Total	Counties					
		LA	Riverside	S Bnrndno	Orange	Ventura	Other*
		(A)	(B)	(C)	(D)	(E)	(F)
Summer discount plan	31%	30%	<b>43%</b> <b>F</b>	<b>36%</b> <b>F</b>	28%	15%	23%
Energy efficiency program (e.g., bulb exchange)	29%	25%	<b>45%</b> <b>BEF</b>	32%	26%	22%	27%
Refrigerator recycling program	22%	23%	21%	20%	22%	<b>34%</b> <b>G</b>	8%
Energy management service to track and lower energy bills	20%	11%	<b>39%</b> <b>BEFG</b>	<b>35%</b> <b>BFG</b>	<b>21%</b> <b>BFG</b>	7%	3%
Equipment maintenance program	13%	10%	<b>21%</b> <b>G</b>	16%	10%	12%	3%
Renew able or clean energy program	6%	4%	6%	<b>12%</b> <b>B</b>	8%	4%	6%
None	39%	<b>42%</b> <b>C</b>	22%	37%	<b>44%</b> <b>C</b>	<b>48%</b> <b>C</b>	41%
Base	559	199	91	71	121	52	25

- Riverside county participation rates are above average for several programs, while LA, Orange, and Ventura counties are at or below participation rates across several programs.
- Almost half (48%) of Ventura customers do not participate in any of these programs, indicating an opportunity for customer education. This may also be true in LA and Orange counties.

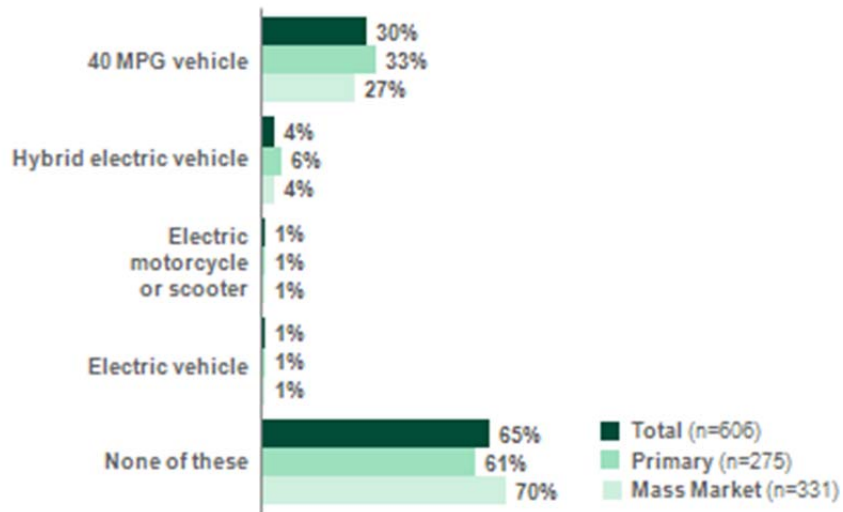


**FIGURE 4. ENERGY PROGRAM PARTICIPATION<sup>2</sup> – SCE vs. US Q755**

<sup>2</sup> Additional responses asked in SCE are omitted from graph for purpose of comparison.

\* Indicates small cell size; results should be considered directional.

- Almost three times as many SCE customers use an energy management service compared to US consumers.
  - Energy-Efficient Vehicles Owned



**FIGURE 5. ENERGY-EFFICIENT VEHICLES OWNED**  
**Q703, MULTIPLE RESPONSE ALLOWED, BASE N=606**

- The majority of customers surveyed do not own any of these energy efficient vehicles.
- Differences between primary and mass-market customers are not significant.
- Three-in-ten (30%) surveyed own vehicles achieving at least 40 miles per gallon.
- Ownership of electric vehicles is almost nil.

**TABLE 6. ENERGY-EFFICIENT VEHICLES OWNED BY COUNTY\* Q703, MULTIPLE RESPONSE ALLOWED, BASE N=606**

	Total	Counties					
		LA	Riverside	S Brnrndno	Orange	Ventura	Other*
		(A)	(B)	(C)	(D)	(E)	(F)
40 MPG vehicle	30%	29%	19%	<b>43% C</b>	29%	29%	24%
Hybrid electric vehicle	4%	<b>7% D</b>	2%	1%	5%	3%	3%
Electric vehicle	1%	2%	3%	0%	1%	0%	0%
Electric motorcycle or scooter	1%	0%	3%	0%	2%	0%	3%
None of these	65%	64%	<b>75% D</b>	57%	66%	67%	74%
Base	606	222	96	75	132	55	26

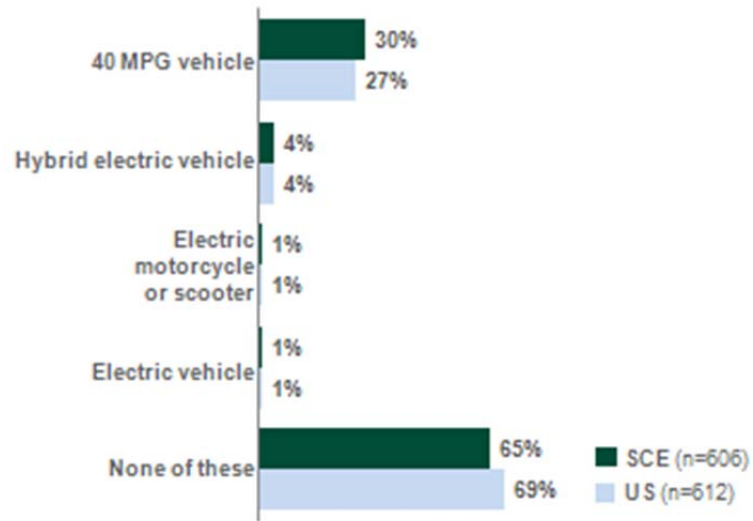
- LA has a greater proportion of hybrid electric vehicles than other counties. If hybrid electric vehicle battery charging stresses the grid, education and remediation efforts might be targeted for LA County.
- Four-in-ten San Bernardino customers (43%), use 40 MPG+ vehicles – far higher than other counties.
- Riverside is much less likely to use any of these energy-conserving vehicles.

**TABLE 7. ENERGY-EFFICIENT VEHICLES OWNED BY SEGMENT Q703, MULTIPLE RESPONSE ALLOWED, BASE N=606**

	Total	Consumer Type		Age			Income			
		Primary	Mass	18-34	35-54	55+	Under \$50K	\$50K- <\$100K	\$100K- <\$150K	\$150K+
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
40 MPG vehicle	30%	33%	27%	<b>41% DE</b>	<b>29% E</b>	11%	<b>39% GHI</b>	27%	19%	19%
Hybrid electric vehicle	4%	6%	4%	6%	4%	4%	3%	5%	2%	<b>13% FH</b>
Electric motorcycle or scooter	1%	1%	1%	0%	1%	1%	1%	1%	1%	1%
Electric vehicle	1%	1%	1%	2%	-	1%	1%	1%	1%	3%
None of these	65%	61%	70%	53%	<b>69% C</b>	<b>82% CD</b>	58%	67%	<b>78% FG</b>	68%
Base	606	275	331	176	237	164	100	242	124	78

- Four-in-ten 18 to 34 year-olds (41%), drive 40 MPG+ vehicles.
- Eight-in-ten customers aged 55+ (82%) drive none of these vehicles.
- Upper income customers (e.g., \$150,000 or more) are more likely to drive a hybrid electric vehicle (13%).

\* Indicates small cell size; results should be considered directional.

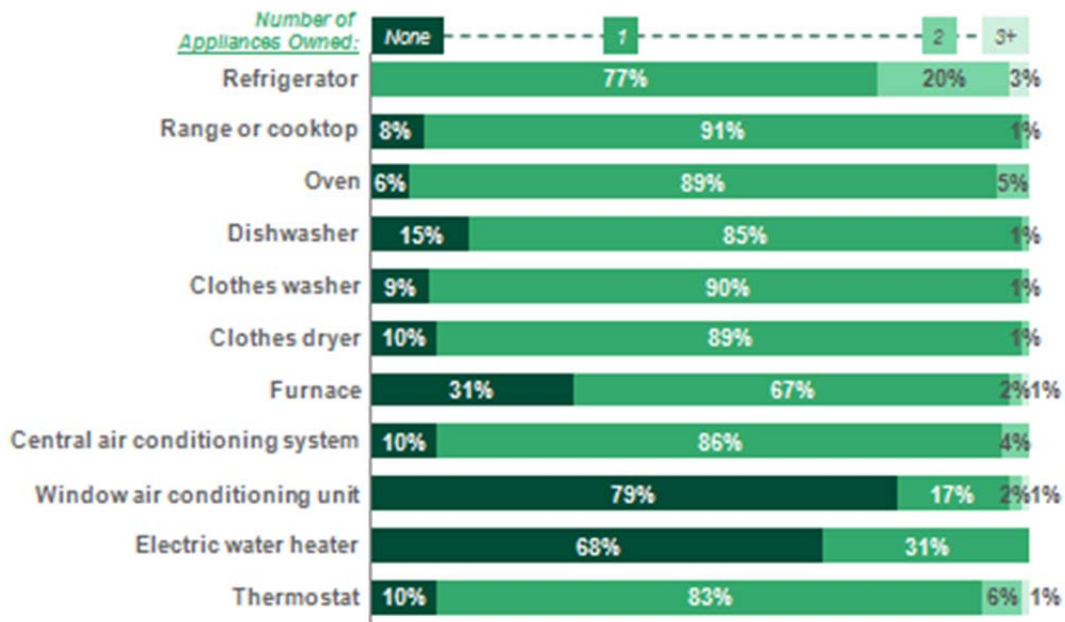


**FIGURE 6. ENERGY-EFFICIENT VEHICLES OWNED – SCE vs. US**  
**Q703, MULTIPLE RESPONSE ALLOWED**

Differences between SCE and US are not significant.

## APPLIANCES PROFILE

### APPLIANCES OWNED



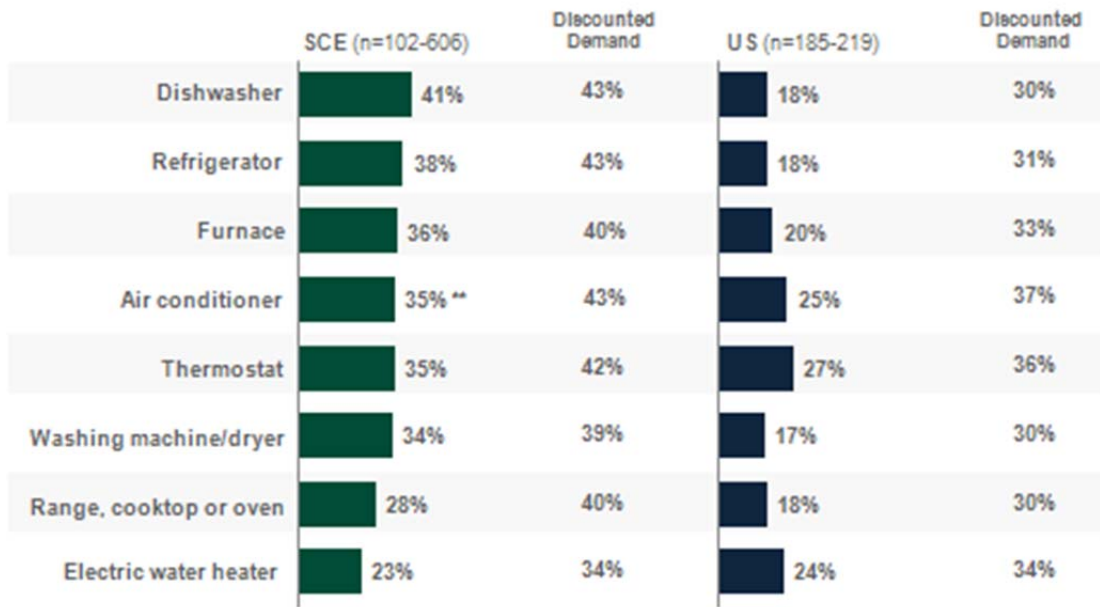
**FIGURE 7. APPLIANCES OWNED<sup>3</sup>**  
**Q711, BASE N=606**

More than 1 in 5 surveyed (23%), own more than one refrigerator.

<sup>3</sup> Stacked bars may not equal 100% due to rounding.



LIKELIHOOD TO REPLACE CURRENT APPLIANCES WITH SMART APPLIANCES



**FIGURE 8. LIKELIHOOD TO REPLACE WITH SMART APPLIANCES – SCE vs. US<sup>4</sup> Q739**

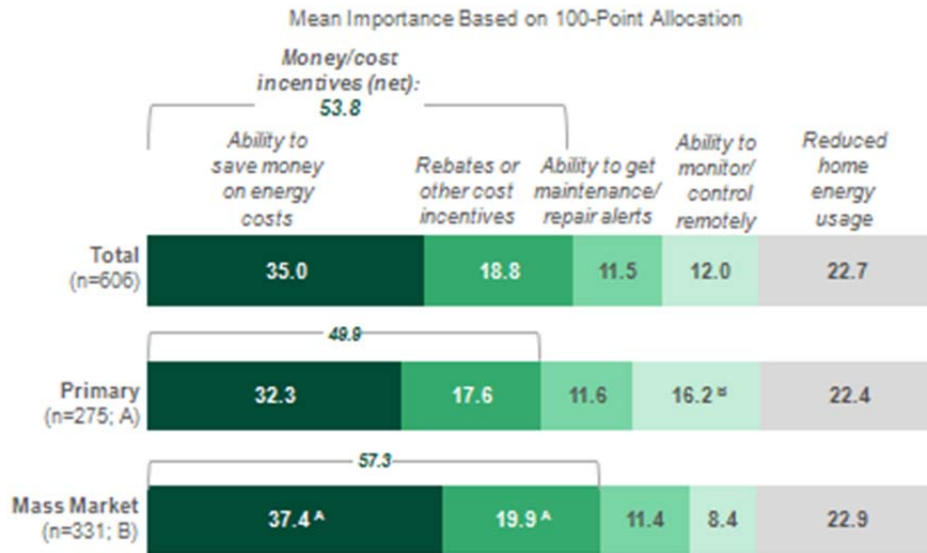
A substantial group of customers expects to replace existing appliances with smart ones, in some cases more than twice the proportion of US consumers.

<sup>4</sup> Discounted demand is defined in the Appendix C.

\*\* SCE Only - Air conditioner was asked of all respondents; other appliances were reviewed by half or fewer.

SMART APPLIANCE FEATURE IMPORTANCE

Customers divided 100 points across six smart appliance selection criteria, allocating more points to the criteria they believe are more important, and fewer points to criteria they perceive as less important to their household.



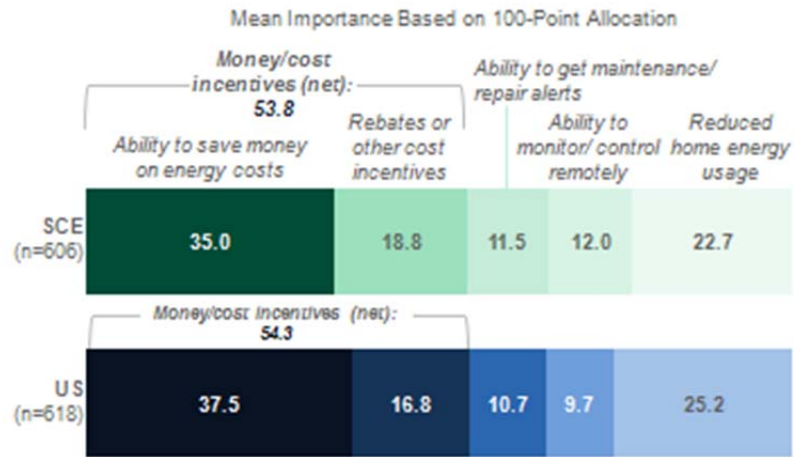
**FIGURE 9. SMART APPLIANCE FEATURE IMPORTANCE<sup>5</sup> Q741, BASE N=606**

Customers reaffirm their preference for saving money – saving money is the leading feature importance for purchasing a smart appliance, followed by reducing home energy consumption.

Saving money and using rebates are significantly more important to mass-market customers than to primary market customers.

<sup>5</sup> Stacked bars may not equal 100% due to rounding.

Sub- and superscript letters in tables and graphs denote statistically significant differences between segments. In the graph above, Mass Market responses for “Ability to save money on energy costs” are statistically different from Primary Market responses.

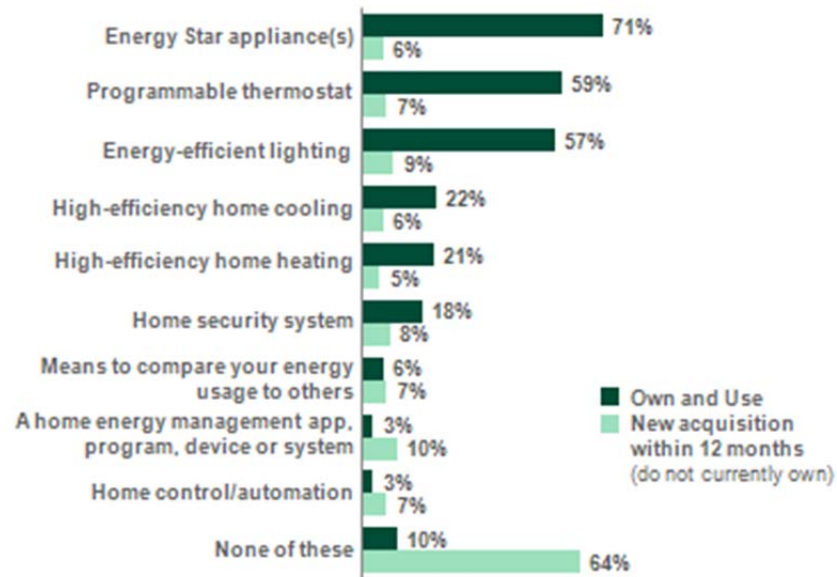


**FIGURE 10. SMART APPLIANCE FEATURE IMPORTANCE<sup>6</sup> – SCE vs. US Q741**

- SCE customers and US consumers rate the importance of features similarly, again led by saving money.

<sup>6</sup> Stacked bars may not equal 100% due to rounding.

## Energy Saving Devices Owned or Likely to be Newly Acquired



**FIGURE 11. APPLIANCES OWNED AND USED, OR PLAN TO NEWLY ACQUIRE IN NEXT 12 MONTHS Q717A, Q717B, MULTIPLE RESPONSE ALLOWED, BASE N=606. NEW ACQUISITION WITHIN NEXT 12 MONTHS DOES NOT OVERLAP CURRENT OWNERSHIP.**

- Less expensive and easy to deploy options are already in the majority of homes:
  - Programmable thermostat
  - Energy-efficient lighting
  - Arguably, Energy Star appliances (as they are less costly than installing high efficiency heating and cooling, and possibly home control/automation systems)
- Solutions that are more expensive are less common.
- Slightly more than 1 in 5 have high-efficiency cooling or heating installed.
- Almost two-thirds (64%), plan no acquisition of any of these devices in the next 12 months and no single device stands out as a target for consumer acquisition.
  - It seems promising that 6% of participants plan to acquire high-efficiency cooling, and 10% plan to acquire HEMS in the next year. Assuming these investment and upgrade plans continue apace or grow with an improving economy, the implication is that over the next 5 to 10 years a notable proportion will have installed HEMS, or upgraded to high-efficiency heating and cooling.

**TABLE 8. APPLIANCES OWNED AND USED BY COUNTY\*  
Q717A, MULTIPLE RESPONSE ALLOWED, BASE N=606.**

Own and Use	Total (A)	Counties					
		LA (B)	Riverside (C)	S Brnrдно (D)	Orange (E)	Ventura (F)	Other* (G)
Energy Star appliance(s)	71%	67%	75%	71%	72%	80%	74%
Programmable thermostat	59%	51%	<b>69% BE</b>	<b>73% BEF</b>	51%	52%	<b>84% BEF</b>
Energy-efficient lighting	57%	58%	66%	48%	54%	52%	67%
High-efficiency home cooling	22%	18%	<b>37% BE</b>	22%	18%	30%	23%
High-efficiency home heating	21%	17%	<b>32% BE</b>	23%	17%	30%	21%
Home security system	18%	<b>23% E</b>	<b>25% E</b>	14%	10%	19%	0%
Means to compare your energy usage to others	6%	3%	<b>13% BF</b>	<b>11% F</b>	6%	2%	0%
Home energy management app, device, system	3%	2%	3%	8%	5%	0%	0%
Home control/automation system	3%	2%	3%	4%	4%	4%	0%
None of these	10%	<b>14% DFG</b>	9%	5%	10%	5%	3%
Base	606	222	96	75	132	55	26

- Riverside County, given comparatively new home construction, has higher penetration of energy conserving devices. LA and Orange counties, with older construction and a higher proportion of renters, tend to lag.
- Riverside County has the greatest proportion of installed high-efficiency cooling and heating systems, among other things.
- On the other hand, LA and Orange counties have the lowest proportions of high-efficiency cooling and heating systems, and relatively low proportions of installed programmable thermostats.
- Riverside and San Bernardino counties have the greatest proportions of programmable thermostats and the means to compare household energy usage to others.

\* Indicates small cell size; results should be considered directional.

Stacked bar charts and summed totals in tables do not always equal 100% due to rounding.

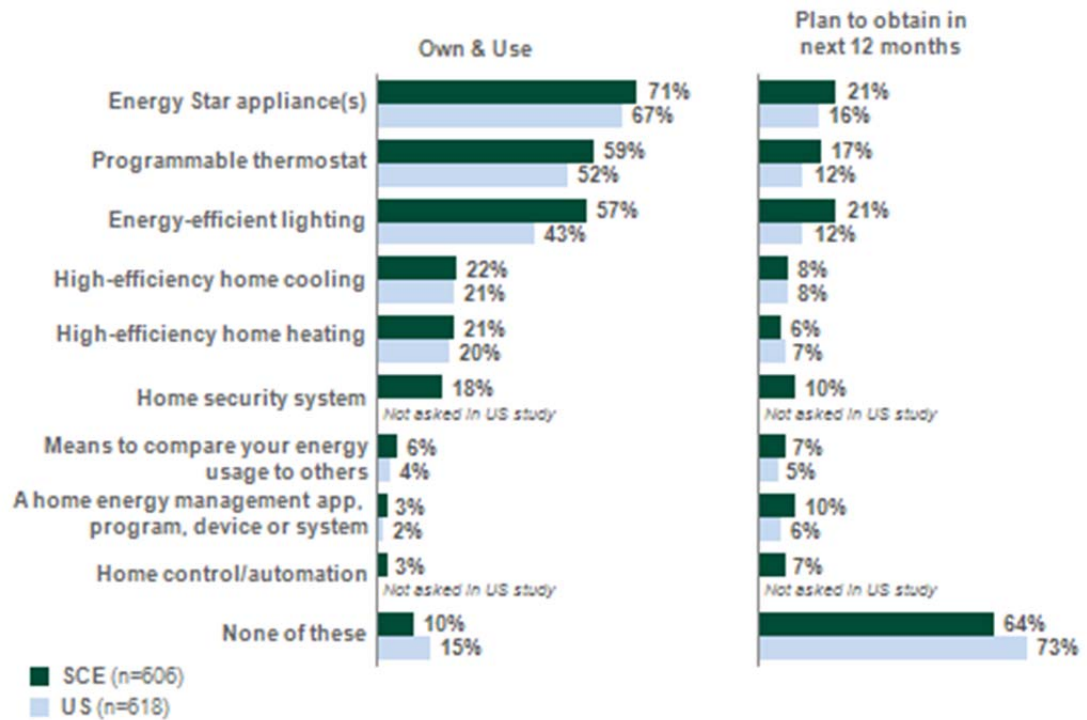
**TABLE 9. PLAN TO NEWLY ACQUIRE IN NEXT 12 MONTHS BY COUNTY\***  
**Q717B, NEW ACQUISITION WITHIN NEXT 12 MONTHS DOES NOT OVERLAP CURRENT OWNERSHIP.**

Plan to obtain	Total (A)	Counties					
		LA (B)	Riverside (C)	S Brnrdo (D)	Orange (E)	Ventura (F)	Other* (G)
Home energy management app, device, system	10%	11%	12%	10%	6%	7%	12%
Energy-efficient lighting	9%	5%	5%	<b>17% BC</b>	<b>13% BC</b>	9%	9%
Home security system with alarm	8%	4%	<b>13% B</b>	<b>16% B</b>	7%	0%	12%
Means to compare your energy usage to others	7%	7%	3%	<b>11% F</b>	<b>8% F</b>	2%	5%
Programmable thermostat	7%	6%	5%	6%	11%	5%	5%
Home control/automation system	7%	6%	9%	9%	6%	7%	0%
High-efficiency cooling	6%	<b>7% F</b>	3%	<b>14% CEF</b>	5%	0%	5%
Energy Star appliance(s)	6%	6%	8%	8%	5%	2%	9%
High-efficiency heating	5%	6%	1%	<b>9% C</b>	4%	<b>6% C</b>	3%
None of these	64%	65%	60%	59%	64%	75%	63%
Base	606	222	96	75	132	55	26

- San Bernardino County has the greatest proportions likely to acquire high-efficiency cooling, heating, and the means to compare energy usage, suggesting a desire to take action to conserve energy.
- Riverside and San Bernardino counties also are more likely, compared to others, to plan to add a home security system
- The majority of counties surveyed do not intend to acquire any of these energy saving devices, led by 75% in Ventura.

\* Indicates small cell size; results should be considered directional.

Stacked bar charts and summed totals in tables do not always equal 100% due to rounding.



**FIGURE 12. APPLIANCES OWNED AND USED OWN AND USE, OR PLAN TO NEWLY ACQUIRE IN NEXT 12 MONTHS – SCE vs. US Q717A, Q717B, MULTIPLE RESPONSE ALLOWED. NEW ACQUISITION WITHIN NEXT 12 MONTHS DOES NOT OVERLAP CURRENT OWNERSHIP.**

- SCE customers own and use more of these energy saving devices compared to US consumers. Furthermore, SCE customers are more likely to plan to acquire such devices.
- SCE customers are more likely to own energy-efficient lighting, Energy Star appliances, and programmable thermostats than WE consumers are, and are more likely to obtain these in the next year.
- US consumers are more likely to own none of these, and plan to acquire none in the coming year.

AGE OF APPLIANCES AND REPLACEMENT TIMING

In Table 10, the likely replacement timing of appliances (in rows) is compared against the age of the customer’s existing appliances (in columns).

**TABLE 10. AGE OF APPLIANCES (REFRIGERATOR, RANGE, AND OVEN) AND REPLACEMENT TIMING<sup>7</sup> NEW ACQUISITION WITHIN NEXT 12 MONTHS DOES NOT OVERLAP CURRENT OWNERSHIP.**

Planned Replacement Date:	Current Age of Appliance SCE Customers		
	2-4 years	5-9 years	10+ years
<b>Refrigerator</b>			
Within 1 year	13%	6%	7%
In 2-4 years	30%	45%	38%
In 5-9 years	31%	29%	34%
In 10+ years	12%	11%	3%
Don't plan to replace	14%	9%	18%
Base	40	59	24*
<b>Range or cooktop</b>			
Within 1 year	11%	5%	2%
In 2-4 years	19%	24%	22%
In 5-9 years	21%	36%	39%
In 10+ years	15%	16%	11%
Don't plan to replace	33%	19%	25%
Base	54	62	59
<b>Oven</b>			
Within 1 year	11%	9%	5%
In 2-4 years	22%	20%	15%
In 5-9 years	24%	35%	44%
In 10+ years	18%	18%	15%
Don't plan to replace	26%	17%	22%
Base	52	59	46

- The refrigerator appears to be the appliance to be replaced sooner than others are.
- **Refrigerator:** Regardless of age of the existing appliance, almost half of those surveyed plan to replace their refrigerator within four years.
- **Range and oven:** Replacement cycle for ranges and ovens is a little longer, with more expecting to replace in 5+ years.

<sup>7</sup> Q714-Q716; Excludes age of appliances if the base is < 20 consumers with that appliance’s age. Percentage saying they do not know when they will replace an appliance are not shown.

\* Indicates small cell size; results should be considered directional.



**TABLE 11. AGE OF APPLIANCES (DISHWASHER, CLOTHES WASHER AND DRYER) AND REPLACEMENT TIMING<sup>8</sup>  
NEW ACQUISITION WITHIN NEXT 12 MONTHS DOES NOT OVERLAP CURRENT OWNERSHIP.**

Planned Replacement Date:	Current Age of Appliance SCE Customers			
	1 year	2-4 years	5-9 years	10+ years
<b>Dishwasher</b>				
Within 1 year		6%	12%	14%
In 2-4 years		11%	31%	30%
In 5-9 years		32%	37%	46%
In 10+ years		22%	8%	0%
Don't plan to replace		29%	12%	9%
Base		61	78	31
<b>Clothes Washer</b>				
Within 1 year	5%	6%	15%	18%
In 2-4 years	0%	10%	41%	39%
In 5-9 years	14%	32%	29%	27%
In 10+ years	72%	16%	7%	2%
Don't plan to replace	9%	36%	9%	15%
Base	21*	72	72	43
<b>Clothes Dryer</b>				
Within 1 year	0%	7%	11%	14%
In 2-4 years	0%	16%	47%	40%
In 5-9 years	18%	30%	25%	33%
In 10+ years	68%	14%	6%	3%
Don't plan to replace	14%	33%	11%	10%
Base	21*	68	67	51

- Customers seem to be willing to use dishwashers, clothes washers and dryers for a longer period.
- **Dishwasher:** The replacement cycle for a dishwasher seems to begin when the appliance is five years (or even 10+ years when the current appliance age is factored in), though almost half have a dishwasher that is 10+ years old that won't be replaced for another five or more years.
- **Washer and dryer:** Customers get 10+ years of service from these appliances.

<sup>8</sup> Q714-Q716; Excludes age of appliances if the base is < 20 consumers with that appliance age. Percentage saying they do not know when they will replace an appliance are not shown.

\* Indicates small cell size; results should be considered directional.

**TABLE 12. AGE OF APPLIANCES (FURNACE, AIR CONDITIONING, THERMOSTAT) AND REPLACEMENT TIMING<sup>9</sup> NEW ACQUISITION WITHIN NEXT 12 MONTHS DOES NOT OVERLAP CURRENT OWNERSHIP.**

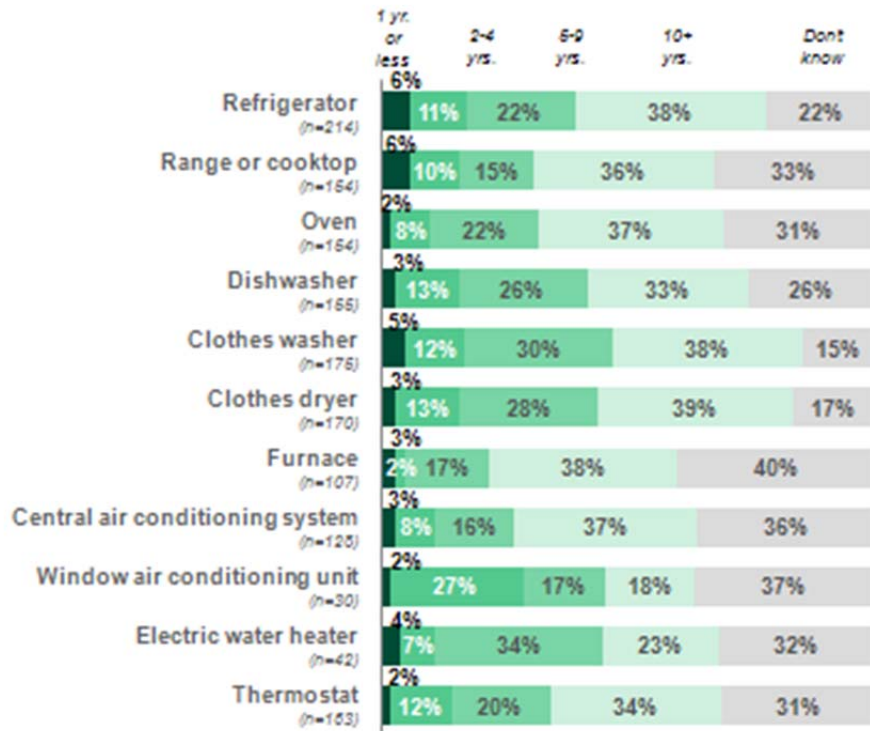
Planned Replacement Date:	Current Age of Appliance SCE Customers		
	2-4 years	5-9 years	10+ years
<b>Furnace</b>			
Within 1 year	0%	0%	2%
In 2-4 years	12%	9%	17%
In 5-9 years	3%	40%	27%
In 10+ years	38%	42%	28%
Don't plan to replace	46%	10%	26%
Base	23*	23*	52
<b>Central Air Conditioning</b>			
Within 1 year	5%	0%	7%
In 2-4 years	12%	22%	16%
In 5-9 years	13%	29%	25%
In 10+ years	29%	29%	27%
Don't plan to replace	41%	19%	26%
Base	34	35	58
<b>Thermostat</b>			
Within 1 year	5%	13%	20%
In 2-4 years	16%	13%	17%
In 5-9 years	20%	32%	31%
In 10+ years	22%	23%	10%
Don't plan to replace	36%	21%	22%
Base	43	39	31

- **Furnace:** The replacement cycle on a home furnace is relatively long, compared to other appliances.
- **Central air:** One-third, or more, plans to replace their central air conditioning before ten years, regardless of the current age of the existing system.
- **Thermostat:** More than 40% expect to replace their thermostat before 10 years.

<sup>9</sup> Q714-Q716; Excludes age of appliances if the base is < 20 consumers with that appliance that age. Percentage saying they do not know when they will replace an appliance are not shown.

\* Indicates small cell size; results should be considered directional.

AGE OF APPLIANCES REPLACED

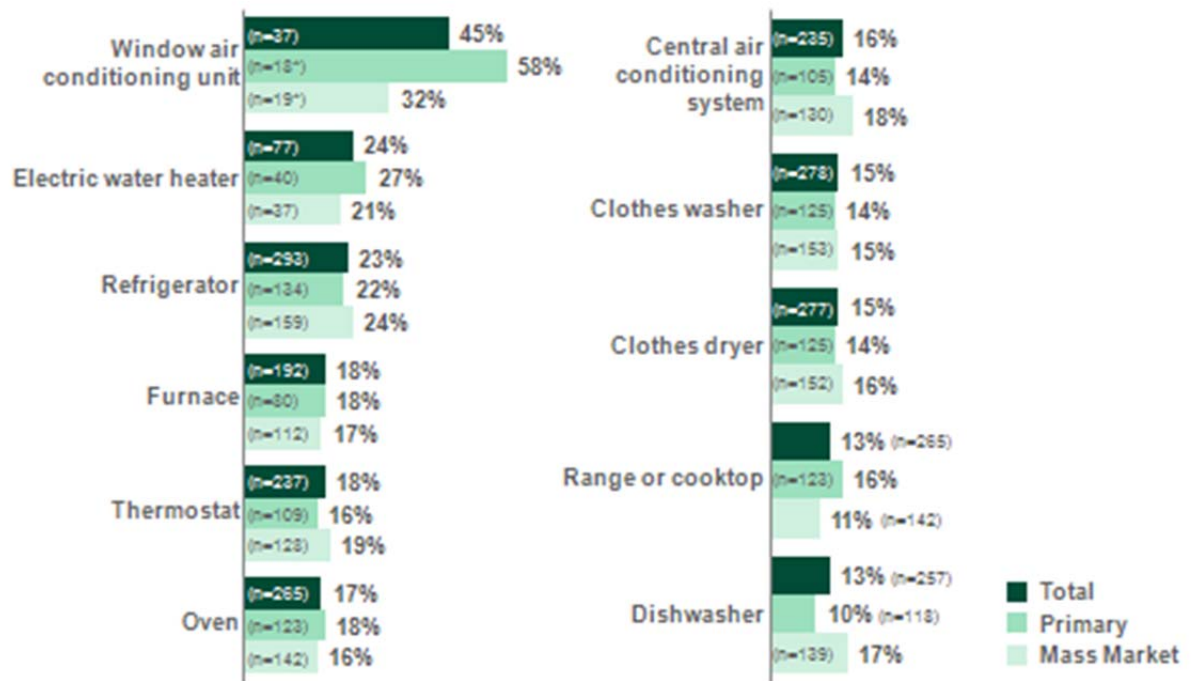


**FIGURE 13. AGE OF APPLIANCES REPLACED<sup>10</sup>**  
**Q713, BASE = NUMBER OF APPLIANCES**

- Most acquired appliances to fill a gap (as opposed to replacing an old unit) and consequently did not answer this question.
- Of the remainder, many say they were replacing a unit that was 5 years old or more, or are uncertain of the unit’s age.

<sup>10</sup> Data stacked to show all appliances in household. Stacked bars may not sum to 100% due to rounding.

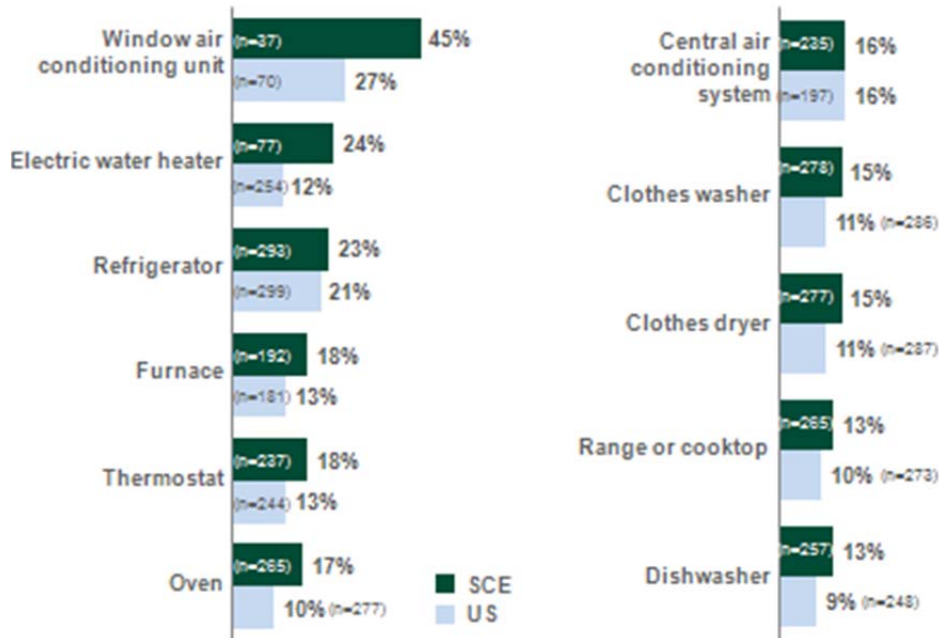
APPLIANCE RETIREMENT



**FIGURE 14. APPLIANCE RETIREMENT – PLAN TO CONTINUE USING EXISTING APPLIANCE AFTER NEW ONE IS PURCHASED Q715**

- With the exception of window air conditioners, most expect to recycle or otherwise dispose of appliances after they acquire a new one.
- There are exceptions – more than 1 in 5 plans to continue using their old electric water heaters (24%) and refrigerators (23%), suggesting incentives that are more lucrative may be in order.\*
  - It is likely that more lucrative refrigerator incentives would yield greater energy savings, as only 32% of the base currently own and use an electric water heater, compared to 100% who currently own and use a refrigerator.

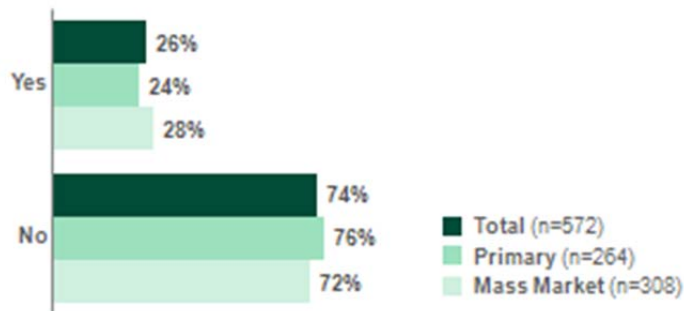
\* Indicates small cell size; results should be considered directional.



**FIGURE 15. APPLIANCE RETIREMENT – PLAN TO CONTINUE USING EXISTING APPLIANCE AFTER NEW ONE IS PURCHASED – SCE VS. US Q715**

- In general, SCE customers appear less likely to retire devices compared to US consumers, particularly window air conditioners and electric water heaters.

APPLIANCE RETIREMENT ATTRIBUTED TO A UTILITY INCENTIVE PROGRAM



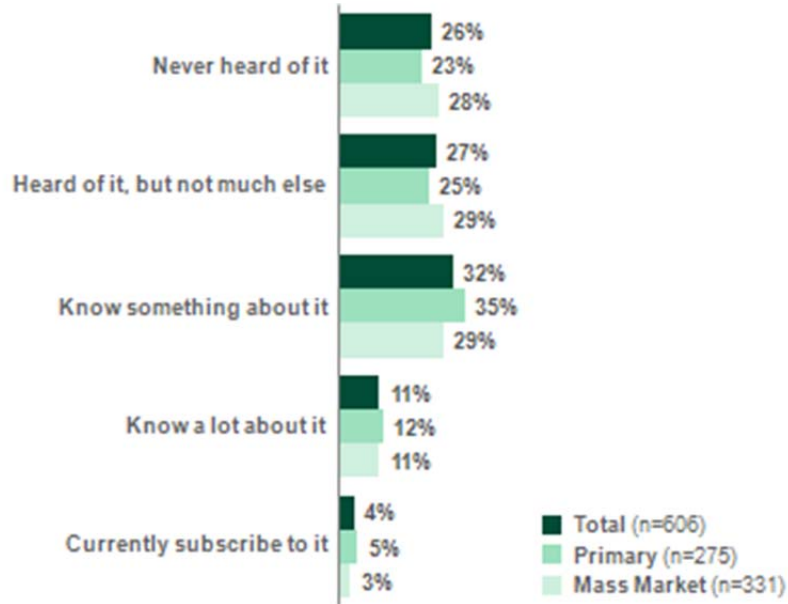
**FIGURE 16. APPLIANCE RETIREMENT ATTRIBUTED TO A UTILITY INCENTIVE PROGRAM Q716B, BASE N=572**

- One-in-four (26%) replaced an appliance as a result of their participation in a utility-sponsored program.
  - If SCE desires to increase the rate of participation in such programs, customer education and/or better incentives may be warranted.

## DYNAMIC PRICING

Consumers read a brief description of dynamic pricing, and then answered several questions about it. Questions regarding Smart Appliances were asked later in the survey.

### AWARENESS OF AND SUBSCRIPTION TO DYNAMIC PRICING



**FIGURE 17. AWARENESS OF AND SUBSCRIPTION TO DYNAMIC PRICING**  
**Q723, BASE N=606**

Dynamic pricing has reasonable awareness but few subscribers:

- Almost three-quarters (74%) are aware of dynamic pricing, almost half have some knowledge (47%: know something + know a lot + subscribe). Although, dynamic pricing awareness was high among participants, only 4% subscribe to this program.

**TABLE 13. AWARENESS OF AND SUBSCRIPTION TO DYNAMIC PRICING BY COUNTY\***

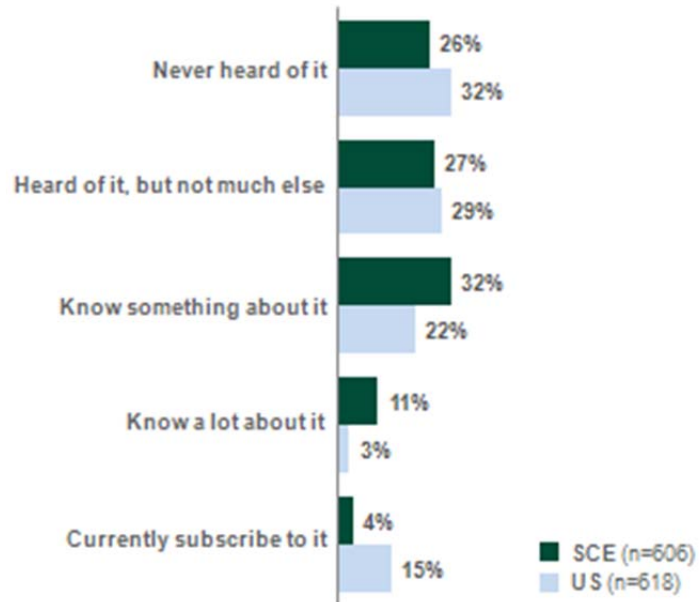
	Total	Counties					
		LA	Riverside	S Brnrdrno	Orange	Ventura	Other*
		(A)	(B)	(C)	(D)	(E)	(F)
Never heard of it	26%	27%	24%	<b>31% F</b>	27%	14%	13%
Heard of it, but little else	27%	26%	30%	27%	25%	39%	28%
Know something about it	32%	35%	29%	26%	32%	34%	33%
Know a lot about it	11%	9%	13%	11%	12%	13%	24%
Currently subscribe to it	4%	4%	4%	5%	6%	0%	3%
Base	606	222	96	75	132	55	26

- San Bernardino is least likely to have heard of dynamic pricing (31%).
- Other segments with low familiarity (data not shown):
  - 18-34 year-olds have lower awareness – 34% have not heard of dynamic pricing.
  - Household income less than \$50,000.
  - Household with children: 32%.

\* Indicates small cell size; results should be considered directional.

Sub- and superscript letters in tables and graphs denote statistically significant differences between segments. In the table above, San Bernardino County responses for “Never heard of it” are statistically different from responses in column F, or responses from Ventura County.

Stacked bar charts and summed totals in tables do not always equal 100% due to rounding.

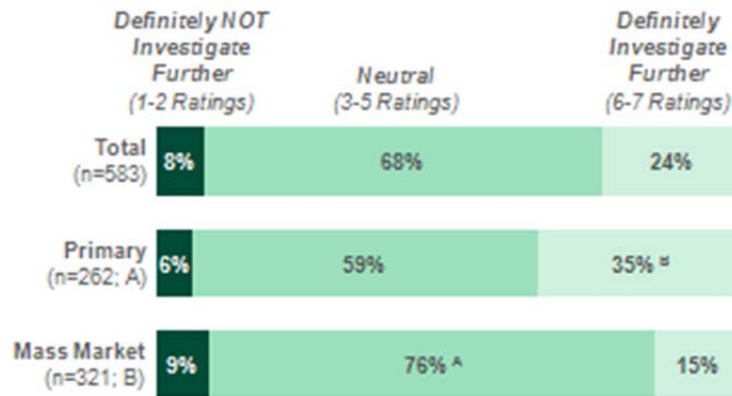


**FIGURE 18. AWARENESS OF AND SUBSCRIPTION TO DYNAMIC PRICING – SCE vs. US Q723**

- Subscription to dynamic pricing is almost four times higher in the US than among SCE customers.



LIKELIHOOD TO FURTHER INVESTIGATE DYNAMIC PRICING



**FIGURE 19. LIKELIHOOD TO INVESTIGATE DYNAMIC PRICING FURTHER<sup>11</sup>**  
**Q870, BASE N=583**

- There is notable interest in learning more about dynamic pricing, with one-in-four customers (24%) likely to investigate. This suggests an opportunity exists to drive dynamic pricing.
- Note that primary segment customers are significantly more likely to investigate compared to mass-market customers.

**TABLE 14. LIKELIHOOD TO INVESTIGATE DYNAMIC PRICING FURTHER BY COUNTY\***

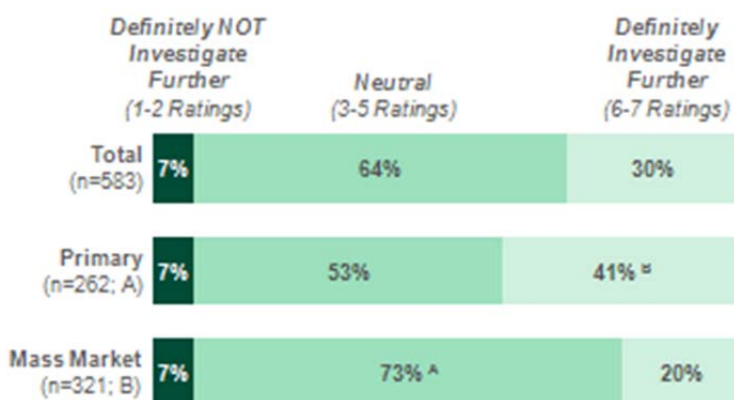
	Total	Counties					
		LA	Riverside	S Brnrdrno	Orange	Ventura	Other*
		(A)	(B)	(C)	(D)	(E)	(F)
Definitely investigate further (6-7)	24%	22%	<b>29%</b> <b>G</b>	<b>36%</b> <b>EG</b>	20%	22%	8%
Neutral (3-5)	68%	70%	67%	59%	69%	62%	<b>86%</b> <b>D</b>
Definitely not investigate further (1-2)	8%	7%	4%	5%	11%	15%	5%
Base	583	214	91	73	125	55	25

- San Bernardino: 36% are likely to investigate dynamic pricing further.
  - With low awareness and relatively high interest in learning more, San Bernardino County appears to be an excellent target for customer education.
- Other segment details (data not shown):
  - 18-34 years old: 30% likely to investigate further.

<sup>11</sup> Stacked bars may not equal 100% due to rounding.

\* Indicates small cell size; results should be considered directional.

LIKELIHOOD TO SWITCH TO DYNAMIC PRICING



**FIGURE 20. LIKELIHOOD TO SWITCH TO DYNAMIC PRICING<sup>12</sup> Q725, BASE N=583**

- Three-in-ten customers are likely to switch to dynamic pricing in the next 12 months.

**TABLE 15. LIKELIHOOD TO SWITCH TO DYNAMIC PRICING BY COUNTY\***

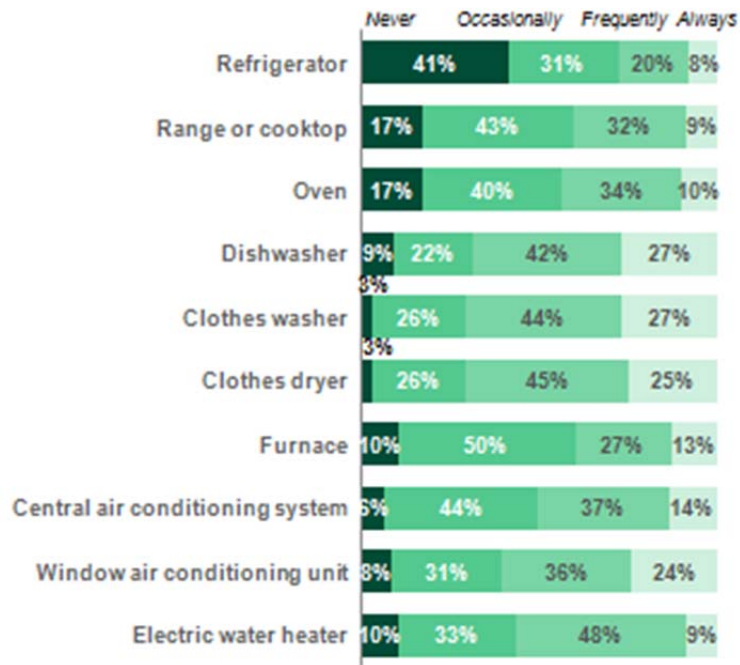
	Total	Counties					
		LA	Riverside	S Brnrndno	Orange	Ventura	Other*
	(A)	(B)	(C)	(D)	(E)	(F)	(G)
Definitely sw itch (6-7)	30%	27%	32%	30%	33%	30%	30%
Neutral (3-5)	64%	67%	64%	64%	59%	59%	65%
Definitely not sw itch (1-2)	7%	6%	4%	6%	9%	11%	5%
Discounted Demand	40%	40%	44%	39%	39%	38%	39%
Base	583	214	91	73	125	55	25

- Directionally, Riverside county has the greatest likelihood to adopt dynamic pricing: 32% (44% discounted)
- Other segment details:
  - 25-34 years old: 37% likely to switch to dynamic pricing (46% discounted)

<sup>12</sup> Stacked bars may not equal 100% due to rounding.

\* Indicates small cell size; results should be considered directional.

ANTICIPATED TIME SHIFTING USAGE OF APPLIANCES GIVEN DYNAMIC PRICING



**FIGURE 21. ANTICIPATED TIME SHIFTING USAGE OF APPLIANCES GIVEN DYNAMIC PRICING<sup>13</sup>**  
**Q851 MULTIPLE RESPONSE ALLOWED, BASE = THOSE ANSWERING**

- More consumers are willing to time shift the usage of dishwashers and clothes washers and dryers – appliances that can run at any time.
- More are willing to “always” time shift window air conditioning units than central air.
- Please note in the next eight tables, the number of customers answering questions about specific appliances from Ventura and Other counties (and in some cases San Bernardino), is small (e.g., fewer than 30) and should be considered directional.

<sup>13</sup> Stacked bars may not sum to 100% due to rounding.

**TABLE 16. CENTRAL AIR CONDITIONING - ANTICIPATED TIME SHIFTING USAGE BY COUNTY<sup>14\*</sup>**

	Total (A)	Counties					
		LA (B)	Riverside (C)	S Brnrndno (D)	Orange (E)	Ventura* (F)	Other* (G)
		Never	6%	3%	6%	15%	3%
Occasionally	44%	38%	<b>60% BD</b>	22%	<b>52% D</b>	42%	65%
Frequently	37%	45%	28%	38%	30%	36%	30%
Alw ays	14%	14%	5%	<b>25% C</b>	14%	18%	0%
Base	270	97	49	33	54	26	11

- San Bernardino County is more likely to always shift air conditioning.
- Riverside and Orange counties are more likely to do so occasionally.

**TABLE 17. FURNACE - ANTICIPATED TIME SHIFTING USAGE BY COUNTY\***

	Total (A)	Counties					
		LA (B)	Riverside (C)	S Brnrndno* (D)	Orange (E)	Ventura* (F)	Other* (G)
		Never	10%	8%	9%	25%	10%
Occasionally	50%	47%	<b>69% D</b>	35%	46%	55%	47%
Frequently	27%	<b>35% C</b>	9%	27%	29%	25%	41%
Alw ays	13%	10%	12%	13%	15%	20%	12%
Base	195	66	32	22	48	21	6

- LA County is more likely to shift furnace use frequently.
- Riverside County is more likely to do so occasionally.

\* Indicates small cell size; results should be considered directional.

**TABLE 18. REFRIGERATOR - ANTICIPATED TIME SHIFTING USAGE BY COUNTY\***

	Total	Counties					
		LA	Riverside	S Brnrдно	Orange	Ventura*	Other*
		(A)	(B)	(C)	(D)	(E)	(F)
Never	41%	33%	<b>59% B</b>	37%	44%	47%	46%
Occasionally	31%	<b>38% D</b>	26%	15%	37%	32%	11%
Frequently	20%	<b>23% C</b>	3%	<b>38% CE</b>	11%	14%	43%
Always	8%	6%	12%	11%	8%	8%	0%
Base	284	107	49	33	58	26	11

- There is willingness to time shift refrigerator usage occasionally to frequently.
- However, the majority in Riverside County are never likely to time shift their refrigerator.

**TABLE 19. DISHWASHER - ANTICIPATED TIME SHIFTING USAGE BY COUNTY\***

	Total	Counties					
		LA	Riverside	S Brnrдно*	Orange	Ventura*	Other*
		(A)	(B)	(C)	(D)	(E)	(F)
Never	9%	8%	4%	12%	5%	12%	37%
Occasionally	22%	16%	27%	26%	27%	29%	0%
Frequently	42%	48%	50%	40%	32%	38%	8%
Always	27%	29%	19%	21%	35%	21%	54%
Base	251	92	45	29	52	26	7

- The majority are willing to shift their dishwasher frequently to always.

\* Indicates small cell size; results should be considered directional.

**TABLE 20. CLOTHES DRYER - ANTICIPATED TIME SHIFTING USAGE BY COUNTY\***

	Total (A)	Counties					
		LA (B)	Riverside (C)	S Brnrndno (D)	Orange (E)	Ventura* (F)	Other* (G)
Never	3%	2%	3%	11%	3%	0%	6%
Occasionally	26%	18%	32%	23%	<b>39% B</b>	38%	6%
Frequently	45%	<b>57% E</b>	45%	43%	32%	41%	12%
Always	25%	23%	20%	22%	26%	21%	75%
Base	268	98	49	31	55	26	9

- The majority are also willing to shift their clothes dryer frequently to always.
- LA County is more likely than others to say they would do so frequently.

**TABLE 21. CLOTHES WASHER - ANTICIPATED TIME SHIFTING USAGE BY COUNTY\***

	Total (A)	Counties					
		LA (B)	Riverside (C)	S Brnrndno (D)	Orange (E)	Ventura* (F)	Other* (G)
Never	3%	1%	2%	11%	3%	0%	6%
Occasionally	26%	21%	33%	23%	33%	38%	6%
Frequently	44%	<b>54% E</b>	46%	43%	33%	41%	12%
Always	27%	25%	19%	22%	31%	21%	75%
Base	271	101	49	31	55	26	9

- The majority are willing to shift their clothes washer frequently to always.
- Again, LA County is more likely than others to say they would frequently do so.

\* Indicates small cell size; results should be considered directional.

**TABLE 22. RANGE OR COOKTOP - ANTICIPATED TIME SHIFTING USAGE BY COUNTY\***

	Total	Counties					
		LA	Riverside	S Brnrдно	Orange	Ventura*	Other*
	(A)	(B)	(C)	(D)	(E)	(F)	(G)
Never	17%	10%	20%	<b>30%</b> <b>F</b>	18%	7%	31%
Occasionally	43%	45%	45%	21%	43%	<b>67%</b> <b>D</b>	37%
Frequently	32%	33%	34%	40%	28%	21%	31%
Always	9%	<b>13%</b> <b>C</b>	2%	9%	11%	4%	0%
Base	258	91	47	30	55	25	10

- A substantial minority are willing to shift use of their range frequently, though more would do so occasionally.

**TABLE 23. OVEN - ANTICIPATED TIME SHIFTING USAGE BY COUNTY\***

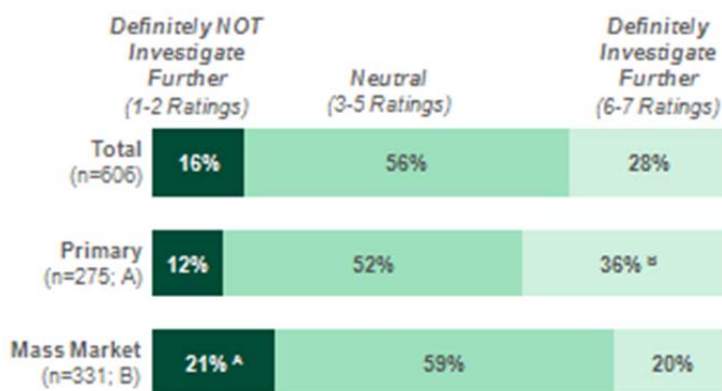
	Total	Counties					
		LA	Riverside	S Brnrдно	Orange	Ventura*	Other*
	(A)	(B)	(C)	(D)	(E)	(F)	(G)
Never	17%	10%	21%	26%	21%	7%	26%
Occasionally	40%	<b>44%</b> <b>D</b>	44%	18%	35%	<b>62%</b> <b>D</b>	37%
Frequently	34%	33%	31%	46%	31%	27%	31%
Always	10%	13%	3%	9%	14%	4%	6%
Base	268	102	45	30	55	26	10

- Likewise, a substantial minority are willing to frequently time shift oven use, though more would do so occasionally.

## DEMAND RESPONSE

Consumers were introduced to the demand response (DR) concept then answered several questions about it.

### LIKELIHOOD TO FURTHER INVESTIGATE DEMAND RESPONSE



**FIGURE 22. LIKELIHOOD TO INVESTIGATE DEMAND RESPONSE FURTHER Q872, BASE N=606**

- DR generates reasonable likelihood to investigate further – including more than one-third of primary market customers (36%), significantly more than mass market.

**TABLE 24. LIKELIHOOD TO INVESTIGATE DEMAND RESPONSE FURTHER BY COUNTY\***

	Total	Counties					
		LA	Riverside	S Brnrndno	Orange	Ventura	Other*
	(A)	(B)	(C)	(D)	(E)	(F)	(G)
Definitely investigate further (6-7)	28%	<b>32%</b> <b>EFG</b>	<b>35%</b> <b>EFG</b>	<b>35%</b> <b>EFG</b>	19%	17%	11%
Neutral (3-5)	56%	56%	56%	50%	60%	52%	60%
Definitely not investigate further (1-2)	16%	12%	9%	15%	<b>21%</b> <b>C</b>	<b>31%</b> <b>BC</b>	30%
Base	606	222	96	75	132	55	26

- Roughly, one-third of San Bernardino, Riverside, and LA counties are likely to investigate DR.

\* Indicates small cell size; results should be considered directional.

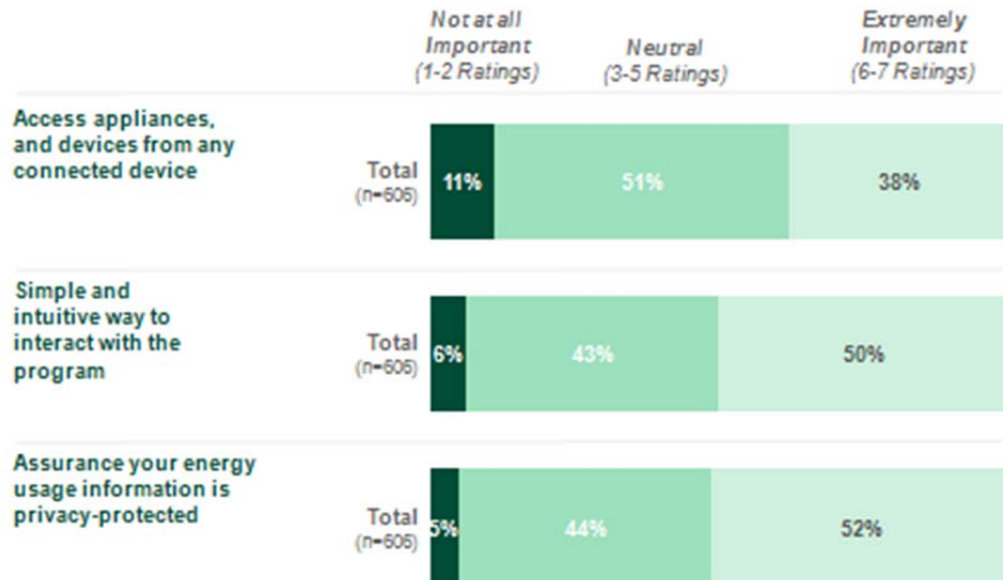
Sub- and superscript letters in tables and graphs denote statistically significant differences between segments. In the table above, LA, Riverside, and San Bernardino County responses for “Definitely investigate further” are statistically different from responses in columns EFG, or responses from Orange, Ventura and Other Counties.

Stacked bar charts and summed totals in tables do not always equal 100% due to rounding.



- The less urban counties – Ventura, Orange and Other – are less likely to investigate.
- Other segment details:
  - 65+ years old: 40% likely to investigate further

DEMAND RESPONSE IMPORTANCE FACTORS



**FIGURE 23. DEMAND RESPONSE IMPORTANCE FACTORS<sup>15</sup>**  
Q861, BASE N=606

- Privacy and ease of use are leading drivers of DR, with remote access not far behind.

**TABLE 25. DEMAND RESPONSE IMPORTANCE FACTORS**

Plan to Obtain	Total	Consumer Type		Age			Income			
		Primary	Mass	18-34	35-54	55+	Under \$50K	\$50K- <\$100K	\$100K- <\$150K	\$150K+
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
Access appliances and devices from any connected device	38%	<b>50%</b> <b>B</b>	28%	39%	35%	38%	39%	36%	35%	44%
A simple and intuitive way to interact with the program	50%	<b>60%</b> <b>B</b>	42%	49%	47%	57%	50%	51%	48%	56%
Assurance your energy usage information is privacy-protected	52%	<b>59%</b> <b>B</b>	45%	54%	48%	55%	51%	50%	49%	62%
Base	606	275	331	176	237	164	100	242	124	78

**SUMMARY TABLE OF TOP TWO BOX SCORES BY SEGMENT**

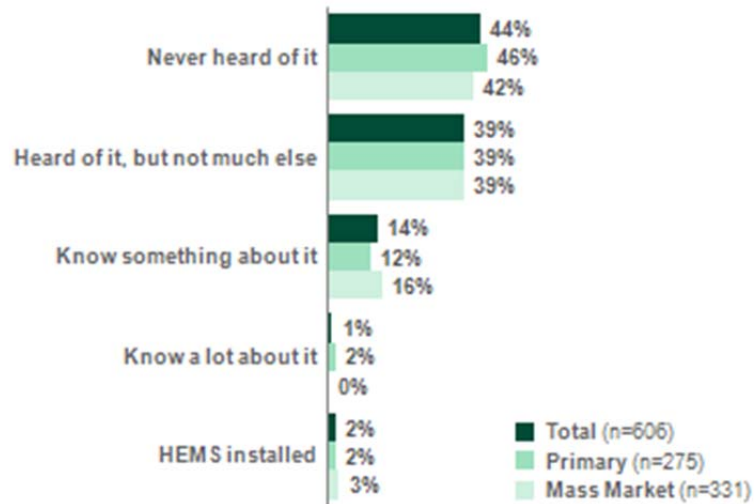
<sup>15</sup> Stacked bars may not equal 100% due to rounding.

- Significantly more primary market customers rate each factor as extremely important, suggesting they may be more invested in the concept.
- There are no meaningful differences by age, income, or across the counties (data not shown).

## HOME ENERGY MANAGEMENT SYSTEM

Consumers read a brief description of the Home Energy Management System (HEMS) concept, and then answered several questions about it.

### AWARENESS AND USE OF HEMS



**FIGURE 24. AWARENESS AND USE OF HEMS**  
Q747/745, BASE N=606

- HEMS have limited awareness and a small user base, even among primary market customers.

**TABLE 26. AWARENESS AND USE OF HEMS BY COUNTY\***

	Total (A)	Counties					
		LA (B)	Riverside (C)	S Brnrndno (D)	Orange (E)	Ventura (F)	Other* (G)
		Never heard of it	44%	47%	39%	34%	45%
Heard of it, little else	39%	35%	43%	46%	35%	49%	37%
Know something about it	14%	14%	17%	14%	17%	12%	5%
Know a lot about it	1%	1%	0%	3%	1%	0%	0%
HEMS already installed	2%	4%	1%	4%	2%	0%	0%
Base	606	222	96	75	132	55	26

- Differences in awareness or use of HEMS by county are not significant.

**TABLE 27. AWARENESS AND USE OF HEMS BY SEGMENT**

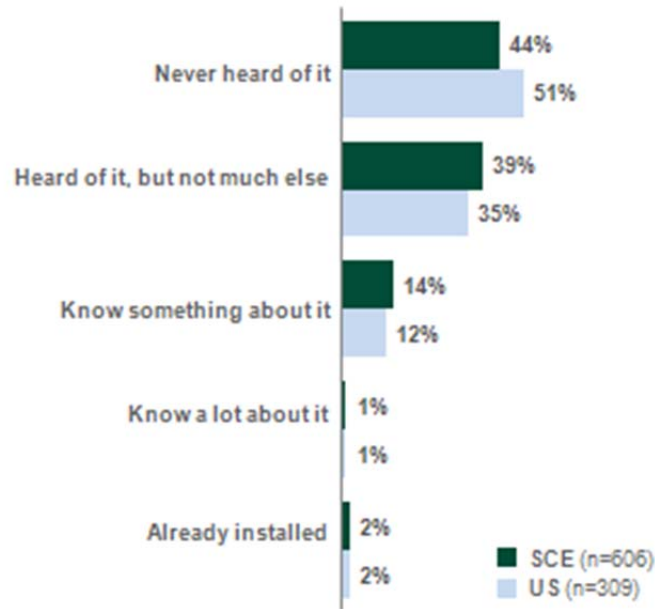
	Total	Consumer Type		Age			Income			
		Primary (A)	Mass (B)	18-34 (C)	35-54 (D)	55+ (E)	Under \$50K (F)	\$50K- <\$100K (G)	\$100K- <\$150K (H)	\$150K+ (I)
		Never heard of it	44%	46%	42%	<b>50%</b> <b>E</b>	43%	35%	<b>49%</b> <b>I</b>	<b>45%</b> <b>I</b>
Heard of it, but little else	39%	39%	39%	34%	42%	42%	32%	<b>43%</b> <b>F</b>	41%	<b>51%</b> <b>F</b>
Know something about it	14%	12%	16%	13%	13%	19%	15%	10%	17%	<b>21%</b> <b>G</b>
Know a lot about it	1%	2%	0%	0%	1%	2%	1%	0%	0%	1%
HEMS installed	2%	2%	3%	3%	2%	2%	3%	1%	3%	3%
Base	606	275	331	176	237	164	100	242	124	78

- Households with children (not shown), young customers, and lower income customers are least familiar with HEMS:
  - Households with children: 53% have not heard of HEMS.
  - 18-34 years old: 50%.
  - Households Income less than \$50,000: 49%.

\* Indicates small cell size; results should be considered directional.

Sub- and superscript letters in tables and graphs denote statistically significant differences between segments. In the table above, responses of "Never heard of it" from 18 to 34 year olds are statistically different from responses in column E, or responses among those 55 and older.

Stacked bar charts and summed totals in tables do not always equal 100% due to rounding.



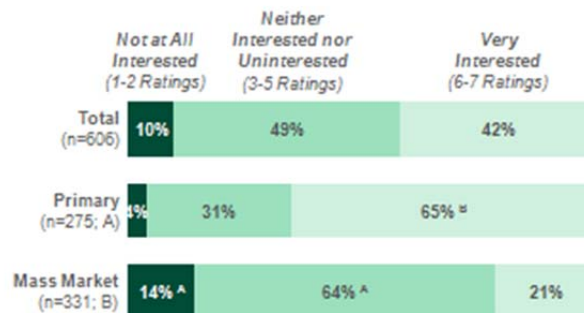
**FIGURE 25. AWARENESS AND USE OF HEMS – SCE vs. US Q747745**

- Slightly more SCE customers are aware of HEMS compared to the US, though the installed base is equally small.

### IN-HOME ENERGY DISPLAY (IHED)

Consumers read a detailed description of the In-Home Energy Display (IHED) concept, and then responded to a number of questions about it.

#### INTEREST IN USING IHED TO MONITOR AND REDUCE ENERGY CONSUMPTION



**FIGURE 26. INTEREST IN USING IHED TO MONITOR AND REDUCE ENERGY CONSUMPTION<sup>16</sup> Q955, BASE N=606**

- A little more than four-in-ten (42%) are interested in using IHED to monitor and reduce their household’s energy consumption.

<sup>16</sup> Stacked bars may not equal 100% due to rounding.

- Primary market customers are significantly more likely to have interest in IHED compared to mass-market customers.

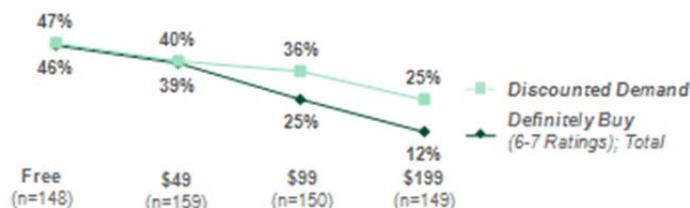
**TABLE 28. INTEREST IN USING IHED TO MONITOR AND REDUCE ENERGY CONSUMPTION BY COUNTY\***

	Total (A)	Counties					
		LA (B)	Riverside (C)	S Brnrndno (D)	Orange (E)	Ventura (F)	Other* (G)
		Very interested (6-7)	42%	44%	43%	44%	38%
Neutral (3-5)	49%	47%	50%	44%	52%	50%	55%
No interest at all (1-2)	10%	9%	7%	11%	10%	14%	11%
Base	606	222	96	75	132	55	26

- Differences by county are not statistically significant.

LIKELIHOOD TO PURCHASE IHED AT VARIOUS PRICE POINTS

Consumers indicated their likelihood to purchase IHED given one of four test prices (e.g., free, one-time cost of \$49, \$99, or \$199). Customers were randomly assigned to one of the four prices yielding potential demand across the prices as illustrated in these price curves.



**FIGURE 27. LIKELIHOOD TO PURCHASE IHED AT VARIOUS PRICE POINTS Q776, BASE N=148-159 PER PRICE POINT**

- Potential demand is greatest when IHED is offered free, as one would expect.
- There is a notable drop in top two-box demand when the test price goes from \$49 to \$99, and again when it increases to \$199.

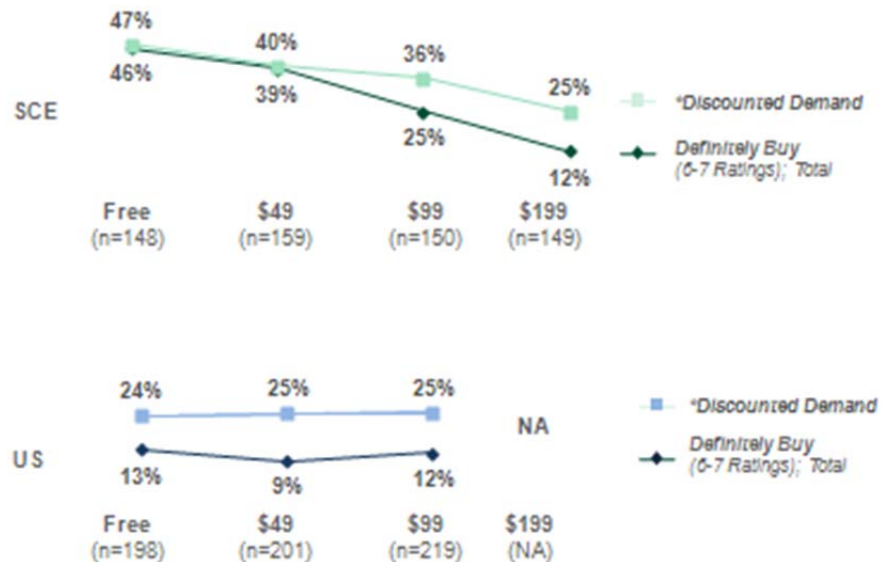
\* Indicates small cell size; results should be considered directional.

Sub- and superscript letters in tables and graphs denote statistically significant differences between segments. In the graph above, responses of “Very interested” from the Primary Market segment are statistically different from responses of the Mass Market.

**TABLE 29. LIKELIHOOD TO PURCHASE IHED AT VARIOUS PRICE POINTS BY CUSTOMER TYPE**

	Consumer Type	
	Primary	Mass Market
	(A)	(B)
<b>Free</b>		
% Definitely Buy (6-7 Ratings)	<b>60% B</b>	29%
<i>Discounted Demand</i>	57%	35%
Base	71	77
<b>\$49</b>		
% Definitely Buy (6-7 Ratings)	<b>63% B</b>	20%
<i>Discounted Demand</i>	52%	32%
Base	71	88
<b>\$99</b>		
% Definitely Buy (6-7 Ratings)	31%	19%
<i>Discounted Demand</i>	41%	31%
Base	69	81
<b>\$199</b>		
% Definitely Buy (6-7 Ratings)	<b>21% B</b>	5%
<i>Discounted Demand</i>	35%	18%
Base	64	85

- Primary market customers are significantly more likely to purchase IHED at each test price point.

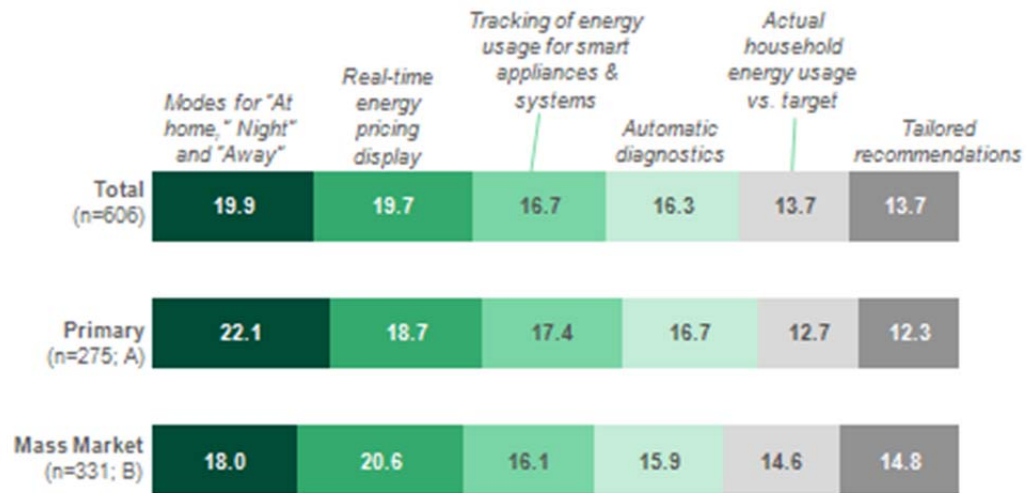


**FIGURE 28. LIKELIHOOD TO PURCHASE IHED AT VARIOUS PRICE POINTS – SCE vs. US Q776**

- Potential demand for IHED is substantially greater among SCE customers than US consumers.

FEATURE IMPORTANCE OF IHED

Customers divided 100 points across six IHED features, allocating more points to the features perceived as more important and fewer points to features perceived as less important.

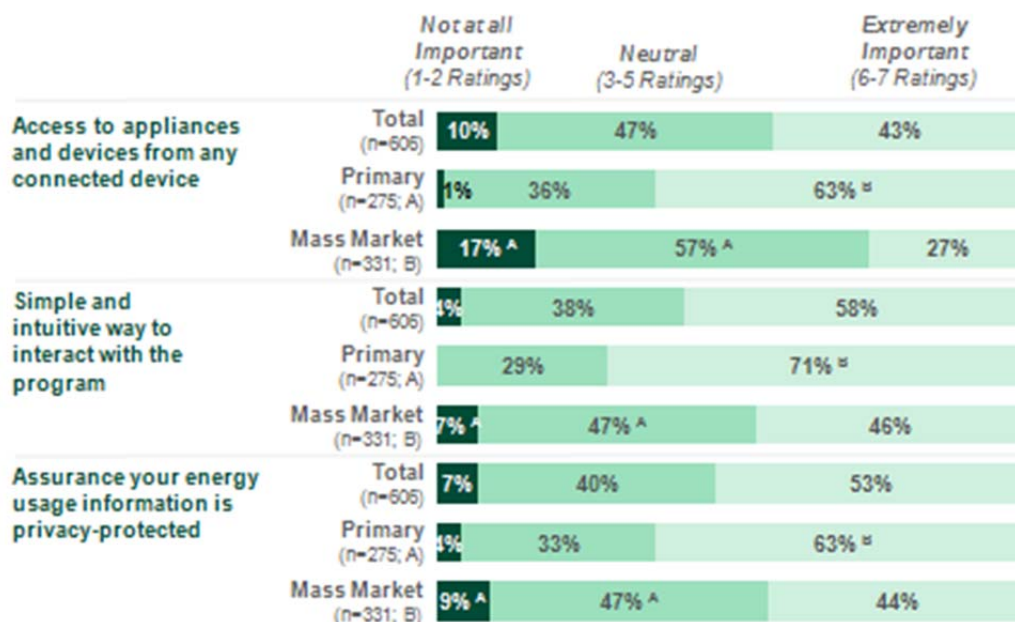


**FIGURE 29. FEATURE IMPORTANCE OF IHED<sup>17</sup>**  
**Q803, BASE N=606**

- No feature is critically more important than others are, and differences between primary and mass-market segments are small.

<sup>17</sup> Stacked bars may not sum to 100% due to rounding.

IMPORTANCE OF IHED DESIGN ELEMENTS

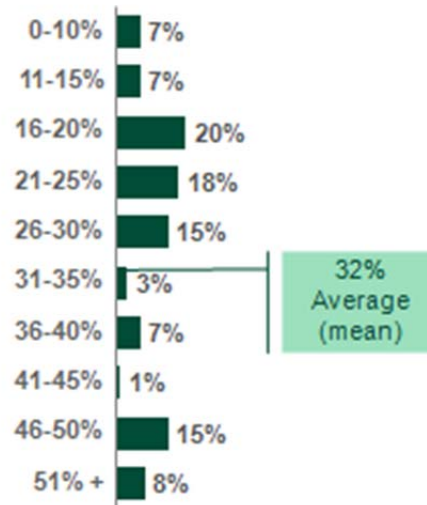


**FIGURE 30. IMPORTANCE OF IHED DESIGN ELEMENTS**  
Q860, BASE N=606

- Ease of use is more frequently rated extremely important, particularly among primary customers.
- Significantly more primary market customers rate these factors extremely important, suggesting here too primary market customers may be more invested in the concept than mass-market customers.
- In particular, 63% of primary market customers rate access from any connected device as extremely important, compared to just 27% of mass market customers.



REDUCTION TO ENERGY BILL REQUIRED TO DEEM IHED WORTHWHILE



**FIGURE 31. PERCENTAGE POINT REDUCTION OF ENERGY BILL REQUIRED Q956, BASE N=606**

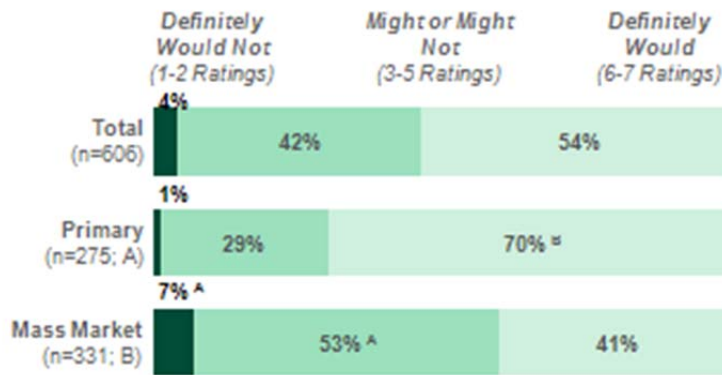
- About one-third (34%) deem IHED worthwhile given 20% savings.
- That 66% require more than 20% savings suggests customers may have unrealistic expectations of the savings IHED is capable of delivering, indicating the need to reset expectations to what is possible, as well as bringing into focus non-financial benefits of IHED.

**TABLE 30. PERCENTAGE POINT REDUCTION TO ENERGY BILL REQUIRED BY SEGMENT**

	Total	Consumer Type		Age			Income			
		Primary	Mass	18-34	35-54	55+	Under \$50K	\$50K- <\$100K	\$100K- <\$150K	\$150K+
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
0-10%	7%	10%	5%	7%	7%	6%	4%	8%	<b>13% F</b>	10%
11-20%	27%	27%	27%	23%	31%	31%	24%	27%	29%	37%
21-30%	33%	32%	33%	35%	30%	32%	30%	37%	31%	31%
31-40%	10%	12%	8%	<b>14% E</b>	10%	6%	11%	10%	10%	6%
41-50%	16%	12%	<b>19% A</b>	13%	16%	19%	<b>20% I</b>	13%	15%	9%
51%+	7%	7%	8%	9%	6%	7%	11%	5%	2%	6%
Base	606	275	331	176	237	164	100	242	124	78

- Overall, segments are generally in alignment in terms of expectations of savings derived from IHED.

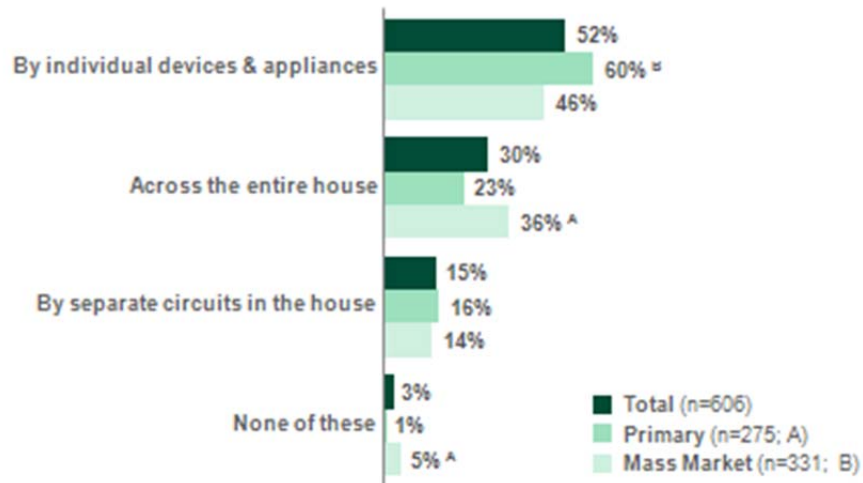
LIKELIHOOD TO CONTINUE USING IHED AFTER SIX MONTHS



**FIGURE 32. LIKELIHOOD TO CONTINUE USING IHED AFTER SIX MONTHS<sup>18</sup>**  
**Q957, BASE N=606**

- Most primary market customers (70%) would continue to use IHED after six months, significantly more than mass-market customers.

PREFERRED DISPLAY OF HOUSEHOLD ENERGY USAGE DATA ON IHED

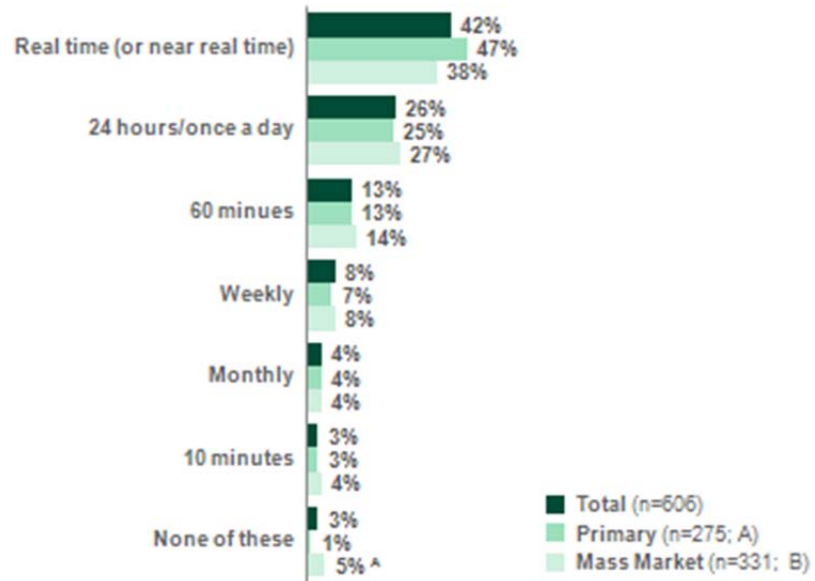


**FIGURE 33. PREFERRED DISPLAY OF HH ENERGY USAGE DATA ON IHED**  
**Q952, BASE N=606**

- Just over half prefer to see energy consumption by individual device.
- Primary market customers tend to prefer device-level information, while mass-market customers are split between device-level and whole house data.

<sup>18</sup> Stacked bars may not equal 100% due to rounding.

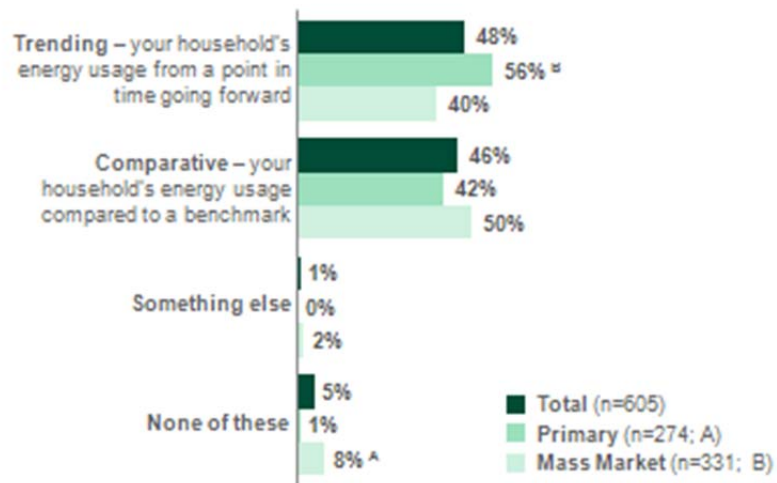
PREFERRED TIME INCREMENTS FOR IHED DISPLAY



**FIGURE 34. PREFERRED TIME INCREMENTS FOR IHED DISPLAY**  
Q954, BASE N=606

- About four-in-ten prefer to see energy consumption in real time.

PREFERRED DATA COMPARISONS

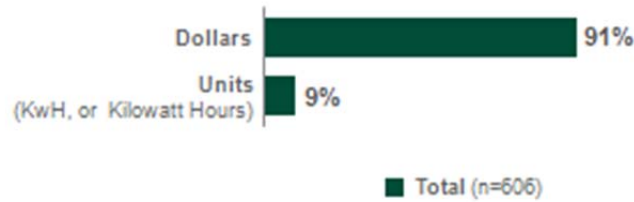


**FIGURE 35. PREFERRED DATA COMPARISONS**  
Q953, BASE N=605

- Consumers are almost evenly split in terms of their preference for comparative data, indicating the need for both options.
  - Forty-eight percent (48%) prefer a “point-in-time” comparison.

- Forty-six percent (46%) prefer to compare consumption with a benchmark, like other consumers in their zip code, or a household daily average.

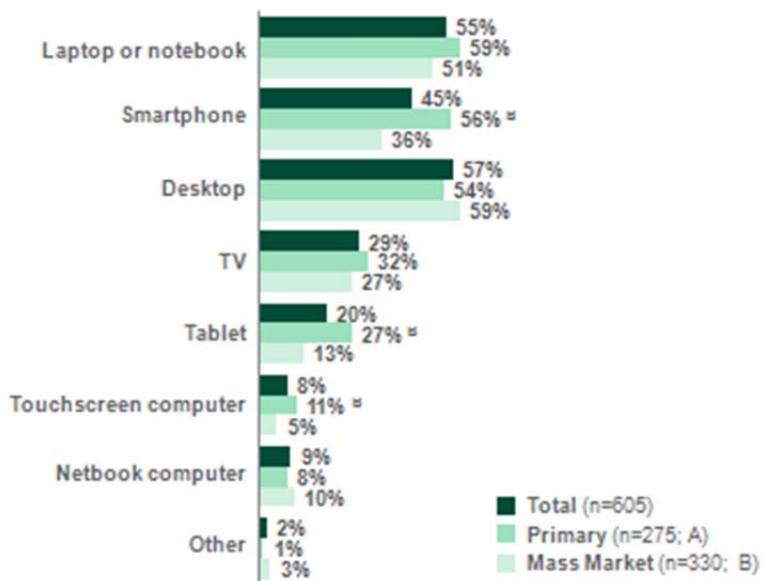
PREFERRED ENERGY CONSUMPTION MEASURE



**FIGURE 36. PREFERRED ENERGY CONSUMPTION MEASURE Q802, BASE N=606**

- Almost all say presenting energy consumption in dollars is more useful to them.

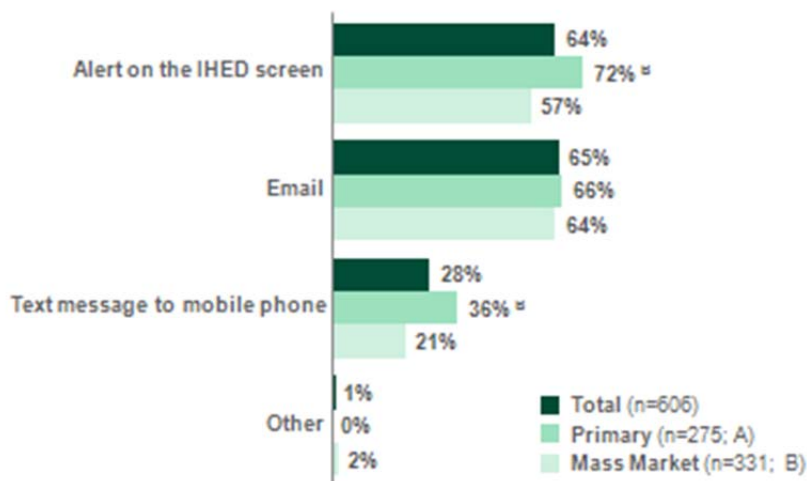
PREFERRED METHOD OF ACCESSING IHED



**FIGURE 37. PREFERRED METHOD OF ACCESSING IHED Q805 MULTIPLE RESPONSE ALLOWED, BASE N=605**

- Three means of accessing IHED lead the others – laptop, desktop, and smartphone.
  - Significantly more primary market customers’ desire smartphone access, underlining their desire for anywhere access and control.

PREFERRED MEDIUM FOR IHED NOTIFICATIONS



**FIGURE 38. PREFERRED MEDIUM FOR IHED NOTIFICATIONS Q804 MULTIPLE RESPONSE ALLOWED, BASE N=606**

- Customers desire notification on the IHED screen and by email.
- Primary market customers are significantly more likely to desire notifications on the IHED and by text message compared to mass market.

LIKELY RESPONSE OF USER TO IHED NOTIFICATIONS

**TABLE 31. LIKELY RESPONSE TO IHED NOTIFICATIONS**

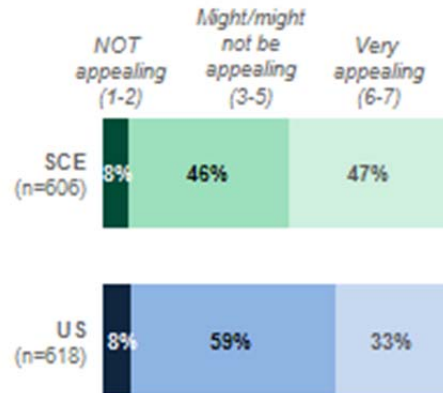
	Air conditioner (n=549)	Thermostat (n=537)	Refrigerator (n=543)	Dishwasher (n=489)	Washing machine/dryer (n=510)
Ignore the notification	3%	4%	2%	6%	2%
Address the issue yourself	34%	51%	45%	40%	45%
Reset the IHED	7%	10%	6%	8%	6%
Call a service technician	57%	36%	47%	47%	47%

- When notified of an issue by IHED, customers are generally split – about 50% would address the issue themselves and the other 50% would call a technician.
- Relatively few would ignore the notification or reset the IHED.

## HOUSEHOLD PROFILE

### APPEAL OF CONNECTED HOME

The connected home concept was communicated to customers in a set of PowerPoint slides that are included in as an attachment to the report. Briefly, the connected home includes a variety of systems and devices that access the Internet, communicate with each other, and control each other. Associated benefits include easier access to entertainment, improved comfort, and convenience.



**FIGURE 39. APPEAL OF CONNECTED HOME Q14B, BASE N=606**

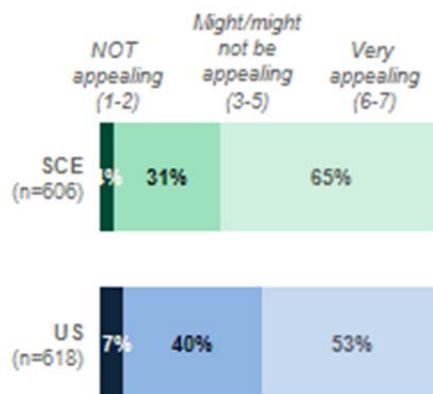
- SCE customers are more likely, than US consumers, to say the connected home concept is appealing.
- This question defines primary vs. mass-market customers – primary customers rate the appeal of the connected home concept a six or seven (e.g., very appealing), whereas mass-market customers rate it one to five (e.g., less than very appealing).

**TABLE 32. APPEAL OF CONNECTED HOME BY SEGMENT\***

Appeal of Connected Home Concept	Total	Consumer Type		Age			Income			
		Primary	Mass	18-34	35-54	55+	Under \$50K	\$50K-<\$100K	\$100K-<\$150K	\$150K+
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
Appealing (6-7)	47%	100%	-	<b>58% DE</b>	45%	33%	47%	45%	51%	45%
Neutral (3-5)	46%	-	85%	35%	<b>49% C</b>	<b>54% C</b>	41%	51%	42%	51%
Not appealing (1-2)	8%	-	15%	6%	6%	<b>13% CD</b>	<b>12% GI</b>	4%	7%	4%
Base	606	275	331	176	237	164	100	242	124	78

- The majority of customers in the 18 – 34-year age group rate the connected home concept very appealing.

LIKELIHOOD TO SETUP A CONNECTED HOME



**FIGURE 40. LIKELIHOOD TO SETUP A CONNECTED HOME Q14C, BASE N=606**

- SCE customers are more likely than US consumers to say they will consider setting up a connected home, assuming cost is not an issue. Results are presented in Figure 40.

\* Stacked bars may not sum to 100% due to rounding.

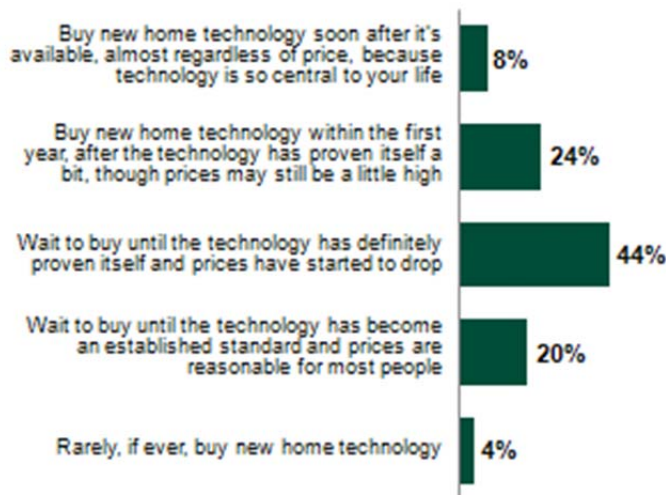
Sub- and superscript letters in tables and graphs denote statistically significant differences between segments. In the table above, responses of “Appealing” from 18 to 34 year olds are statistically different from responses among 35 to 54 year olds and those older than 55.

**TABLE 33. LIKELIHOOD TO SETUP A CONNECTED HOME BY SEGMENT**

	Total	Consumer Type		Age			Income			
		Primary (A)	Mass (B)	18-34 (C)	35-54 (D)	55+ (E)	Under \$50K (F)	\$50K- <\$100K (G)	\$100K- <\$150K (H)	\$150K+ (I)
Definitely consider (6-7)	65%	<b>93% B</b>	41%	<b>76% DE</b>	<b>65% E</b>	51%	64%	64%	67%	71%
Neutral (3-5)	31%	7%	<b>51% A</b>	21%	<b>34% C</b>	<b>40% C</b>	30%	33%	28%	28%
Definitely not consider (1-2)	4%	-	8%	3%	2%	<b>10% CD</b>	6%	2%	5%	1%
Base	606	275	331	176	237	164	100	242	124	78

- Age again is a reasonable predictor – significantly, more young customers would set up a connected home compared to customers 55+.
- Income is not a predictor.

TECHNOLOGY ADOPTION RATE OF CUSTOMERS SURVEYED



**FIGURE 41. TECHNOLOGY ADOPTION Q14, BASE N=606**



**TABLE 34. TECHNOLOGY ADOPTION BY SEGMENT\***

	Total	Consumer Type		Age			Income			
		Primary	Mass	18-34	35-54	55+	Under \$50K	\$50K- <\$100K	\$100K- <\$150K	\$150K+
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
Buy technology soon after it's available because technology is so central to your life	5%	<b>8%</b> <b>B</b>	3%	<b>10%</b> <b>DE</b>	2%	3%	6%	3%	4%	9%
Buy within the first year after the technology has proven itself a bit	17%	<b>24%</b> <b>B</b>	11%	<b>27%</b> <b>DE</b>	<b>15%</b> <b>E</b>	7%	15%	18%	19%	23%
Wait to buy it until the technology has definitely proven itself	45%	44%	45%	42%	<b>53%</b> <b>E</b>	37%	37%	<b>50%</b> <b>F</b>	<b>53%</b> <b>F</b>	47%
Wait to buy it until the technology is established	28%	20%	<b>34%</b> <b>A</b>	17%	<b>27%</b> <b>C</b>	<b>45%</b> <b>CD</b>	<b>35%</b> <b>HI</b>	24%	20%	18%
Rarely, if ever, buy new home technology	5%	4%	6%	4%	3%	9%	7%	4%	4%	3%
NET: Buy new technology soon / within the first year	22%	<b>31%</b> <b>B</b>	14%	<b>37%</b> <b>DE</b>	17%	10%	21%	21%	23%	32%
NET: Wait to buy / rarely	78%	69%	<b>86%</b> <b>A</b>	63%	<b>83%</b> <b>C</b>	<b>90%</b> <b>C</b>	79%	79%	77%	68%
Base	606	275	331	176	237	164	100	242	124	78

- Younger customers are more likely to be early adopters compared to older customers.
- Primary market customers are more likely to be early adopters compared to mass market.

\* In the table above, data is "netted," meaning a number of related responses are "netted" under a single label. To provide readers with detail, the individual categories that constitute the net are shown above the netted values.

**TABLE 35. INFORMATION AND COMMUNICATION TECHNOLOGY BY SEGMENT\***

	Total	Consumer Type		Age			Income			
		Primary	Mass	18-34	35-54	55+	Under \$50K	\$50K-<\$100K	\$100K-<\$150K	\$150K+
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
Computers (NET)	100%	100%	100%	100%	100%	100%	100%	100%	98%	100%
Laptop or notebook	79%	<b>87%</b> <b>B</b>	72%	<b>87%</b> <b>E</b>	<b>82%</b> <b>E</b>	62%	74%	79%	<b>88%</b> <b>FG</b>	<b>88%</b> <b>FG</b>
Desktop computer	78%	77%	78%	70%	78%	<b>86%</b> <b>C</b>	78%	76%	80%	78%
Tablet	23%	<b>30%</b> <b>B</b>	17%	24%	<b>27%</b> <b>E</b>	14%	16%	24%	<b>32%</b> <b>F</b>	<b>38%</b> <b>FG</b>
Netbook	17%	15%	18%	19%	15%	16%	<b>20%</b> <b>G</b>	11%	16%	<b>24%</b> <b>G</b>
Touchscreen computer	6%	8%	5%	7%	6%	5%	6%	6%	6%	9%
Communications (NET)	95%	96%	93%	<b>99%</b> <b>DE</b>	93%	90%	96%	93%	94%	97%
Smartphone	61%	<b>73%</b> <b>B</b>	51%	<b>85%</b> <b>DE</b>	<b>59%</b> <b>E</b>	30%	56%	63%	61%	<b>81%</b> <b>FGH</b>
Regular mobile phone	54%	45%	<b>62%</b> <b>A</b>	40%	<b>55%</b> <b>C</b>	<b>71%</b> <b>CD</b>	<b>60%</b> <b>I</b>	49%	55%	42%
Base	606	275	331	176	237	164	100	242	124	78

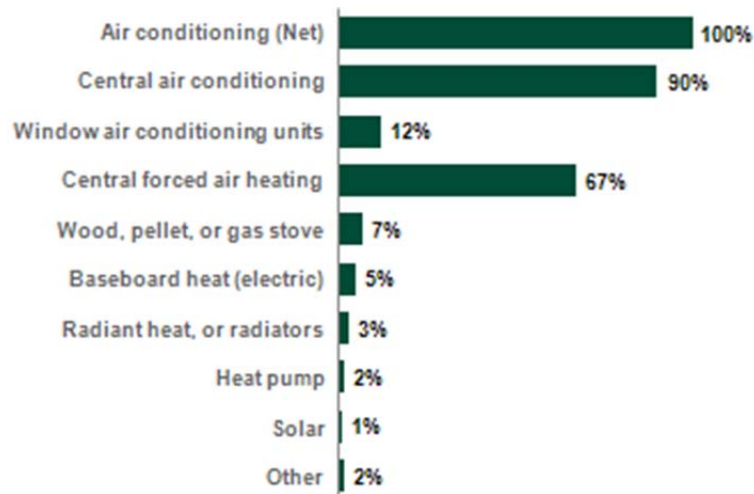
- Primary market customers are twice as likely to own a tablet and almost 50% more likely to own a smartphone compared to mass market.
  - If primary market customers are a target for IHED, DR and so on, providing Smartphone apps to manage interactions with SCE will likely be very important to them.

\* In the table above, data is "netted," meaning a number of related responses are "netted" under a single meaningful label. To provide readers with detail, the individual proportions that constitute the net are shown below the net and indented.



**FIGURE 42. INFORMATION AND COMMUNICATION TECHNOLOGY, SCE vs. US Q800, Q409, BASE N=606**

- SCE customers are more likely to own smartphones and tablets compared to US consumers.



**FIGURE 43. TYPES OF HVAC USED IN THE HOUSEHOLD Q707, BASE N=606**

- Central air conditioning and central forced air heat are the most common heating and cooling mechanisms.

**TABLE 36. TYPES OF HVAC USED IN THE HOUSEHOLD BY COUNTY\***

	Total	Counties					
		LA	Riverside	S Brnrndno	Orange	Ventura	Other*
	(A)	(B)	(C)	(D)	(E)	(F)	(G)
NET: Air conditioning	100%	100%	100%	100%	100%	100%	100%
Central air conditioning	90%	85%	<b>100%</b> <b>BDE</b>	<b>94%</b> <b>B</b>	86%	<b>100%</b> <b>BDE</b>	<b>97%</b> <b>BE</b>
Window air conditioning	12%	<b>19%</b> <b>CDF</b>	2%	7%	<b>15%</b> <b>CF</b>	2%	12%
Central forced air heating	67%	60%	<b>75%</b> <b>B</b>	65%	66%	<b>78%</b> <b>B</b>	<b>82%</b> <b>B</b>
Wood, pellet, or gas stove	7%	7%	5%	5%	10%	-	8%
Baseboard heat (electric)	5%	<b>10%</b> <b>E</b>	-	6%	2%	-	-
Radiant heat, or radiators	3%	4%	3%	1%	2%	-	-
Heat pump	2%	1%	3%	4%	2%	-	-
Solar	1%	0%	1%	4%	1%	0%	-
Other	2%	3%	1%	2%	1%	2%	15%
Base	606	222	96	75	132	55	26

- LA and Orange counties are more likely to use window air conditioners, likely a function of more renters, older construction, and ocean-moderated climates compared to the Inland Empire or the High Desert.

\* Indicates small cell size; results should be considered directional.

**TABLE 37. TYPES OF HVAC USED IN THE HOUSEHOLD BY SEGMENT**

	Total	Consumer Type		Age			Income			
		Primary	Mass	18-34	35-54	55+	Under \$50K	\$50K- <\$100K	\$100K- <\$150K	\$150K+
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
NET: Air conditioning	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Central air conditioning	90%	88%	92%	81%	<b>93% C</b>	<b>97% CD</b>	83%	<b>95% F</b>	<b>97% F</b>	<b>97% F</b>
Window air conditioning	12%	14%	10%	<b>22% DE</b>	7%	6%	<b>19% GHI</b>	8%	6%	4%
Central forced air heating	67%	62%	71%	51%	<b>73% C</b>	<b>83% CD</b>	60%	<b>71% F</b>	71%	71%
Wood, pellet, or gas stove	7%	7%	6%	<b>12% DE</b>	4%	2%	9%	5%	4%	5%
Baseboard heat (electric)	5%	<b>7% B</b>	3%	<b>11% DE</b>	1%	2%	<b>9% GH</b>	2%	1%	3%
Radiant heat, or radiators	3%	3%	3%	<b>5% E</b>	2%	0%	3%	3%	2%	1%
Heat pump	2%	3%	2%	4%	1%	1%	1%	2%	2%	6%
Solar	1%	1%	1%	2%	0%	2%	1%	0%	1%	4%
Other	2%	2%	3%	3%	1%	3%	2%	4%	2%	-
Base	606	275	331	176	237	164	100	242	124	78

- Customers age 18-34 are more likely to use heat other than forced air.

Year Home was Built	Total	Consumer Type		Age			Income			
		Primary	Mass	18-34	35-54	55+	Under \$50K	\$50K- <\$100K	\$100K- <\$150K	\$150K+
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
2011	0%	0%	0%	1%	-	-	-	1%	-	-
2009 to 2010	3%	3%	3%	<b>5% E</b>	2%	0%	5%	1%	3%	3%
2006 to 2008	6%	5%	7%	<b>10% E</b>	5%	3%	4%	7%	10%	4%
2000 to 2005	12%	16%	9%	<b>18% E</b>	13%	6%	12%	13%	11%	12%
1990 to 1999	16%	16%	15%	12%	18%	14%	17%	13%	18%	16%
1980 to 1989	20%	20%	20%	18%	22%	22%	22%	18%	19%	23%
1970 to 1979	18%	18%	18%	17%	13%	<b>26% D</b>	17%	22%	16%	14%
1960 to 1969	11%	9%	12%	8%	13%	10%	12%	9%	9%	10%
1950 to 1959	11%	10%	12%	8%	10%	<b>18% CD</b>	11%	12%	14%	8%
1940 to 1949	1%	1%	1%	1%	2%	1%	-	1%	1%	<b>6% G</b>
1930 to 1939	1%	1%	0%	1%	0%	-	1%	0%	-	-
Prior to 1930	1%	0%	2%	1%	2%	1%	-	3%	-	4%
Base	578	257	321	155	231	164	83	233	123	77

**TABLE 38. AGE OF HOME BY SEGMENT**

- Customers age 18-34 are more likely to live in recently constructed homes.

TENURE IN HOME

**TABLE 39. TENURE IN HOME BY SEGMENT**

	Total	Consumer Type		Age			Income			
		Primary	Mass	18-34	35-54	55+	Under \$50K	\$50K- <\$100K	\$100K- <\$150K	\$150K+
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
Less than 2 years	17%	<b>21% B</b>	13%	<b>32% DE</b>	8%	7%	<b>25% GHI</b>	10%	10%	12%
2-5 years	28%	30%	26%	<b>44% DE</b>	<b>24% E</b>	12%	<b>29% I</b>	<b>33% I</b>	<b>25% I</b>	13%
6-10 years	18%	21%	16%	13%	<b>28% CE</b>	13%	13%	<b>22% F</b>	22%	23%
11-15 years	14%	11%	16%	5%	<b>19% C</b>	<b>18% C</b>	11%	11%	15%	<b>33% FGH</b>
16-20 years	8%	7%	9%	4%	<b>12% C</b>	8%	7%	7%	<b>14% I</b>	5%
21-30 years	9%	7%	10%	2%	6%	<b>20% CD</b>	8%	9%	10%	10%
31+ years	6%	3%	<b>10% A</b>	0%	2%	<b>22% D</b>	7%	7%	6%	4%
Base	606	275	331	176	237	164	100	242	124	78

- As one might expect, customers age 55+ have the greatest tenure in their homes.

HOME OWNERSHIP

**TABLE 40. TYPE OF RESIDENCE BY COUNTY\***

	Total	Counties					
		LA	Riverside	S Brnrdrno	Orange	Ventura	Other*
	(A)	(B)	(C)	(D)	(E)	(F)	(G)
Single-family house	70%	<b>66%</b> E	<b>79%</b> BE	<b>85%</b> BE	52%	<b>73%</b> E	<b>97%</b> BCEF
Multi-family (NET)	28%	<b>31%</b> DG	<b>20%</b> G	14%	<b>45%</b> BCDFG	<b>19%</b> G	3%
Condominium	15%	15%	13%	7%	<b>26%</b> CD	13%	0%
Apartment	13%	<b>16%</b> CDFG	8%	7%	<b>19%</b> CDFG	6%	3%
Co-op	0%	0%	0%	0%	0%	0%	0%
Tow nhouse	1%	3%	0%	1%	1%	2%	0%
Other	1%	0%	1%	1%	2%	<b>6%</b> BC	0%
Base	606	222	96	75	132	55	26

- Almost half of Orange County customers live in multi-family dwellings, significantly more than other counties.
- LA and Orange counties both have significantly more customers living in apartments.

**TABLE 41. OWN VS. RENT BY COUNTY\***

	Total	Counties					
		LA	Riverside	S Brnrdrno	Orange	Ventura	Other*
	(A)	(B)	(C)	(D)	(E)	(F)	(G)
Ow n	73%	71%	<b>82%</b> BE	77%	65%	<b>87%</b> BEG	63%
Rent	27%	<b>29%</b> CF	18%	23%	<b>35%</b> CF	13%	<b>37%</b> F
Base	606	222	96	75	132	55	26

- LA, Orange and Other counties have significant proportions of renters.

\* Indicates small cell size; results should be considered directional.

**TABLE 42. TYPE OF RESIDENCE BY SEGMENT**

	Total	Consumer Type		Age			Income			
		Primary	Mass	18-34	35-54	55+	Under \$50K	\$50K- <\$100K	\$100K- <\$150K	\$150K+
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
Single-family house	70%	64%	<b>75% A</b>	55%	<b>74% C</b>	<b>81% C</b>	63%	73%	<b>76% F</b>	<b>81% F</b>
Multi-family (NET)	28%	<b>33% B</b>	23%	<b>42% DE</b>	22%	16%	<b>34% I</b>	24%	23%	18%
Condominium	15%	19%	12%	17%	15%	13%	13%	15%	18%	15%
Apartment	13%	15%	11%	<b>25% DE</b>	<b>7% E</b>	3%	<b>21% GHI</b>	<b>9% I</b>	5%	3%
Co-op	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Tow nhouse	1%	1%	1%	1%	2%	2%	1%	2%	2%	0%
Other	1%	1%	1%	2%	2%	0%	2%	1%	0%	1%
Base	606	275	331	176	237	164	100	242	124	78

- Note that one-third of primary market customers are renters, significantly more than mass-market customers. The implication is that a notable proportion of primary market customers are to some degree limited in their ability to implement large-scale energy management solutions.

**TABLE 43. OWN VS. RENT BY SEGMENT**

	Total	Consumer Type		Age			Income			
		Primary	Mass	18-34	35-54	55+	Under \$50K	\$50K- <\$100K	\$100K- <\$150K	\$150K+
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
Own	73%	69%	76%	44%	<b>85% C</b>	<b>93% CD</b>	57%	<b>79% F</b>	<b>89% FG</b>	<b>92% FG</b>
Rent	27%	31%	24%	<b>56% DE</b>	<b>15% E</b>	7%	<b>43% GHI</b>	<b>21% HI</b>	11%	8%
Base	606	275	331	176	237	164	100	242	124	78

- Over half of customers age 18-34 are renters.



**TABLE 44. MOTIVATIONS FOR ENERGY CONSERVATION BY SEGMENT**

	Total	Consumer Type		Age			Income			
		Primary	Mass	18-34	35-54	55+	Under \$50K	\$50K-<\$100K	\$100K-<\$150K	\$150K+
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
Low er bill	97%	98%	97%	<b>99% E</b>	<b>98% E</b>	94%	97%	98%	98%	99%
Environmental concerns	47%	<b>53% B</b>	42%	50%	41%	50%	44%	50%	48%	54%
Utility incentive program	33%	36%	29%	35%	29%	32%	30%	32%	35%	44%
Other	1%	1%	1%	-	0%	2%	1%	0%	-	1%
None of these	0%	-	0%	-	-	-	-	-	1%	-
Base	606	275	331	176	237	164	100	242	124	78

- Half of primary market customers are motivated by environmental concerns, significantly more than mass-market customers.

# APPENDIX B

## DETAILED FINDINGS - INDUSTRY INTERVIEWS

Thought-leaders from a dozen North American and global companies were asked to discuss their plans regarding the consumer market for smart grid products and services. For the purpose of the interview, thought-leaders were asked to think of the smart grid in a broad sense, with the discussion focused on consumer components like the smart meter, HEMS, smart appliances, and related consumer products and services.

Note, this research is qualitative and findings should be construed as directional in nature.

## GENERAL THEMES

Thought-leaders say interested parties need to identify, and then rally around a single communication standard. This removes a major hurdle, adds simplicity, eliminates problems stemming from incompatible products, etc.

- Virtually all agree, open communication standards are a must, and proprietary standards will impede progress.
  - Thought-leaders assert that the lack of standards and protocols also impedes consumer education efforts.
- Requiring manufacturers to build in multiple standards increases cost.
  - Several say taking an ecosystem approach to the smart grid makes sense - all players must confer, pull together, and exploit synergies.
- The opposite – a “siloeed” approach and individual efforts – will slow progress across the entire sector.

Several convey a sense that energy utilities have an opportunity before them in terms of engaging customers in a more expansive way via smart meters, HEMS, and associated consumer services. This is in contrast with existing service provider customer relations that typically consist of provision of power and the monthly bill.

- Thought-leaders suggest the conservative nature of some utilities will prevent them from taking advantage of the opportunity. They point out that this can open the door for competitors.
- Several who work with or sell products and services to energy utilities are waiting for the utilities to move forward with smart grid products and services. They say that if utilities continue to “go slow,” their companies may be forced to search for new channels and partners.

## CONSUMERS

Thought-leaders agree – consumer education is an absolute must. The majority of consumers are likely to sit on the sidelines unless they learn about desired benefits that come with action, or a notable cost due to inaction.

- Thought-leaders assert that consumers lack knowledge about energy, let alone information regarding individual-level or societal benefits derived from the smart grid. Therefore, most consumers lack a strong rationale to purchase goods or services related to the smart grid.
- Consumers do know they would like to save money by conserving energy – this is the leading motivation to conserve energy.
  - “All consumers think they are paying too much for energy and any increase (in cost) is too much, in general. So they are very much interested in solutions that will help them manage their energy costs.” Energy Consultant
  - The cost of energy for most households is small relative to other expenses. As a result, few consumers place importance on conserving energy to reduce their energy bill. For most, the cost is not high enough to warrant spending time or energy on this.
  - At the same time, thought-leaders say most consumers who do reduce energy consumption will save little, or may even experience only a slowdown in the rate of energy cost increase.
  - These two issues undercut the promise of leveraging financial savings as a means of driving sales of smart grid products and services. Consumers do want to save money by using less energy, but the potential savings are small to non-existent.
- Furthermore, most consumers are reluctant to pay extra for appliances and devices whose primary benefit is energy conservation.
- Rebates therefore remain an important financial tool.
- Reducing energy consumption will require motivations beyond the promise of financial incentives. There must be a concerted effort to communicate desirable end-user benefits in addition to financial incentives.
- Lifestyle benefits like convenience, increased comfort, and flexibility should be the focus, with financial incentives as secondary or supporting messages.
- In addition, DR and related programs require consumers to cede some control over appliances and HVAC to energy utilities and possibly even third party service providers. Consumers are unlikely to do so unless they understand the rationale, and/or realize benefits like comfort, convenience, and reduced cost.

## ENERGY PROVIDERS

Thought-leaders assert that for most consumers, the existing relationship between energy consumption and the cost of the energy is distant and weak, and could improve.

- Utility bills typically arrive 30 to 60 days after consumption happens, making it difficult to link consumer behavior to cost.

- Furthermore, consumers do not have information that would enable them to make intelligent decisions about how to reduce energy consumption beyond simple decisions like turning off a light or adjusting the thermostat.
- For most consumers, the energy bill is their sole source of information about energy consumption. The bill reports total consumption – this does not provide the detail necessary to support behavior change.
- Consumers see some energy utilities as sources of expertise. Leveraging this perception could drive energy conservation.
- Thought-leaders advance a number of ideas that will provide better data and a closer relationship between usage and cost so the consumer can make informed choices about energy conservation. These include:
  - Real-time smart meter data so the consumer can initiate a change and see the result in household energy consumption. Ideally, this would be expressed in dollars and cents so the consumer understands the financial implication.
    - “It’s very important to get electricity consumption in real time. A day late is useless to consumers, even if it’s broken into hourly chunks. It has to be in real time. They have to understand, if they flick a switch, something happens.” Energy Consultant
    - “How is it relevant to my life that I’m seeing a thermostat that tells me I’m spending 11¢ a kilowatt hour when I have nothing to compare it to?” Global Retailer
  - Device-level consumption data so the consumer can identify devices that consume the most energy.
    - “(With appliance level real time energy usage data), you can help the consumer get a better view of what is actually using energy in the household and that is probably a better path to changing usage patterns of the consumer.” Communications Service Provider
- Pre-paid energy billing – consumers pay up front, making the relationship between usage and payment much tighter.
- Dynamic pricing – this prompts consumers to time-shift consumption.
- Thought-leaders touch on the challenge of maintaining consumer interest in energy conservation over time. Whether the consumer has fleeting interest or achieves an initial conservation goal and moves on, the concern is that consumer interest and attention is limited.
  - Thought-leaders suggest developing long-term strategies that remind consumers about energy conservation, with efforts devoted to making it engaging and fun.
- Thought-leaders also advance a number of strategic suggestions.
  - Exploit low hanging fruit – for example, the thermostat and HVAC – focus on low cost steps that are relatively easy to implement and yield the most return on investment.
  - Solution(s) must be flexible – one size does not fit all.
    - For example, there are people for whom comfort completely outweighs a desire to reduce energy consumption or the energy bill. Energy conservation initiatives are unlikely to motivate this group of consumers.

However, these consumers may embrace solutions that promise comfort and convenience and save energy as a side benefit.

- Similarly, young single adults may seldom be home and therefore less able to achieve meaningful energy savings.
- On the other hand, families with children are frequently home and consuming energy – these families may have interest and capacity to conserve energy.
- To that end, energy utilities are urged to get closer to their customers by segmenting them to identify groups similarly motivated to reduce energy consumption. This allows for more efficient targeting of consumers, and more effective messaging and positioning efforts. Potential segments include:
  - Thrifty – conserving energy is a means of saving money
  - Conservation-oriented – those for whom consuming less energy is the goal
  - Green – those who seek to preserve the environment by using less energy
  - Civic duty / do the right thing – saving energy because it's one's responsibility, or the right thing to do
  - Minimally to uninterested – saving energy is not on their radar
    - *“Energy needs to fit the consumer’s lifestyle. The industry has been adamant that consumers understand how the energy industry works. The consumer gets their energy bill and they look at the all line items and charges, and say, “I don’t understand kilowatts, but I see that dollar amount looks about right.”*  
Energy Consultant
- Because energy conservation is not terribly “sexy” and potential savings from energy conservation are relatively small, bundling energy management tools and services with other consumer offers is a way to extend market penetration.
- Bundling energy management with services like entertainment, security, and home automation increases the likelihood consumers will “sample” energy management.
  - *“It hasn’t been proven that there’s enough savings for the consumer to really be engaged in home energy management on its own. I think the utilities will need to partner with others to show the entire benefit of home automation networking, of which home energy management is a part.”* Home Security Firm
- A number of corporations advocate for a bundled or “solutions” approach where home energy management is a module that can be rolled into customized bundles with entertainment, communications, and/or security. Such corporations include:
  - ADT Pulse Home Automation – ADT bundles home automation, climate and light control, and remote video monitoring with its residential security products.
  - Best Buy Home Energy Departments – Best Buy offers in-store education about energy conservation, and retails home control and energy management products.

- Verizon Home Monitoring and Control – Verizon bundles energy consumption data, remote climate and light controls, and security with its high-speed Internet, entertainment, and communications products.
- AT&T Mobility's recently announced their Digital Life Services program that, according to the Atlanta Constitution Journal (11/17/2011), will “help consumers manage their home security, health care and energy use.”
- Control4 – manufacturers home automation solutions that “make it possible for virtually everything in your home to work together—from TVs to receivers, DVD players, stereos, speakers, even security systems, garage doors, pools ...”
- Thought-leaders urge energy utilities to innovate – develop new ways to interest consumers in energy conservation. Some are already doing this, thought-leaders say, thereby blunting competitive threats.
- Potential innovations include:
  - Retail strategy – energy providers might partner with retailers in a relationship akin to that of the wireless industry. That is, shoppers can drop in to the home energy department of a retail partner to modify utility rate plans and services, and perhaps receive store loyalty points for meeting consumption reduction targets.
  - Make energy conservation fun – create challenges and contests that evoke friendly competition and yield a public benefit:
    - Energy Trust of Oregon sponsored a “Retire the Oldest Refrigerator” contest.
    - Greenest town in Southern California – one suggested organizing a challenge for consumers to reduce consumption in which the community that reduces consumption the most receives a financial incentive like a grant to a community center or school.
  - Financial incentives – quarterly rebates or discounts on the bill for hitting a consumption reduction target.
  - Pre-paid plans – these help consumers establish a close connection between energy consumption and their bill.
    - Pre-paid also helps low income and credit-challenged consumers pay their bill.
  - Use social networks to ...
    - Educate consumers regarding SCE energy conservation programs, and the relevance, value, and end benefits of saving energy, and,
    - Engage and motivate consumers to save energy.
  - German legislation regarding heat pumps – heat pump buyers get a separate power meter for their new heat pump, and receive a lower energy rate for the heat pump in exchange for the energy utility receiving authority to turn off the heat pump during peak demand.
  - In Brazil, an energy utility van goes into residential neighborhoods during weekends with personnel going door-to-door to conduct spontaneous, brief home energy audits and compact fluorescent lamp (CFL) bulb exchanges.
- Thought leaders expressed concern regarding customer support in the home. Thought-leaders say energy utilities are adept at providing customer support, but

currently that support focuses on delivering reliable power and generally ends at the meter. Installing and supporting applications and devices in the home requires a different skill set, as does delivering real-time energy consumption data to consumers.

- An energy utility expects to provide support limited to power and bill issues using existing call centers and technicians.
- The utility plans to drive demand by offering consumer rebates for a short list of home energy management devices and appliances. This structure places support for hardware with manufacturers, retailers, or other service providers, and not the utility.

## MANUFACTURERS

Virtually all thought-leaders urge prompt resolution of communication standards and interoperability issues – these are generally perceived as critical obstacles to advancing the smart grid, aside from consumer education. They are also perceived as transitory – that these issues will be resolved, but sooner is clearly better than later.

- The consensus is that industry will resolve communication standards issues, but it is happening too slowly, which in turn impedes market growth.
- At least one manufacturer is designing devices with multiple communication standards to work around the issue, but pointed out this raises the unit cost.
- In terms of interoperability, most support open and non-proprietary standards so devices can easily communicate with one another.
- Lowest cost options are likely to prove to be the best – thought-leaders say the majority will not pay extra for devices and services that deliver limited benefits, minimal savings, and have an extended period for return on investment.
- Several specifically urge great design of devices and user interfaces.
  - User interfaces must be simple to use – “Think iPhone, not VCR.”
    - *“We live in an app-based world with great screens and easy, simple-to-use technology. So that has to happen.” Global Retailer*
  - Home energy management should happen in the background, requiring minimal interaction while delivering maximum comfort and convenience.
    - *“We have to make sure systems are relatively easy-to-use. I think they’ll quickly grow fatigued, in terms of, ‘Am I (the consumer) really going to go over to that display and react to it as it’s changing?’ The display may be part of the system, but the key is really automation of energy management.”*  
*Global Manufacturer and Consultant*
- Appliance manufacturers’ expectations regarding customer support are similar to energy utilities – they plan to support their products using existing call centers, technicians, and their existing network of third-party repair vendors.
- Manufacturers (and service providers) expect to push software updates to appliances and other devices automatically via wireless data networks. None plans to require human intervention unless the device itself fails or must be upgraded.

- In the future, manufacturers will probably include remote diagnostics functionality, though it may be offered as a value-added service so manufacturers and service providers recover the cost of building it in and supporting it. Implementation of this functionality would follow resolution of communication standards and interoperability issues.

## RETAIL

Best Buy is an example of what is possible in the retail space – it expects to extend its existing consultative selling approach to energy products and services.

- The plan – listen to the consumer, educate them as to available products and services that address their needs, help them choose the best solution that meets their needs and budget, and install, if desired.
- Best Buy expects to install and support components a la the Geek Squad – Best Buy will do as much or as little as the consumer wants and is willing to pay for.
  - Best Buy is piloting a Home Energy Department concept in three US cities.
- Using a consultative approach, Best Buy educates consumers in-store, and demonstrating products and services are increasingly accessible to the mass market.
- It has been said that energy management concepts are hard to demonstrate in a retail environment, given every home is different. Best Buy's in-store demonstrations and expert sales personnel are designed to alleviate this concern.

## GOVERNMENT

While none of the thought-leaders advocates that government select a standard, several did say government could play a greater role in advancing the effort.

- One pointed to the US conversion to digital television as an example where government and industry worked closely to drive a smooth and reasonably fast-paced desirable change.
  - In that market, US TV and entertainment companies advocated a variety of TV standards and approaches. Ultimately, industry arrived at several standards and device manufacturers accommodated that construct. Government and retailers then worked out a hardware deployment strategy that facilitated conversion of 110+ million US households to digital TV within one year's time.
- Thought-leaders also say government could do more to motivate energy utilities by improving incentives to more aggressively deploy smart meters, home energy management products, and other smart grid initiatives.

## TELECOMMUNICATION COMPANIES

Communication of data from the home to the utility and to home energy management systems and applications must be reliable and secure.

- A manufacturer found that when smart meter data streams are unreliable, or only intermittently available, consumer interest in managing energy wanes.



Consumers want to access the data reliably and on demand. Unreliable data streams result in frustrated consumers.

Utilities might explore partnering with telecoms to leverage their strengths and expertise.

- Strengths that could be leveraged include:
  - Building and maintaining wireless and wired data networks to reliably supply consumers with energy usage data on-demand,
  - Securely transporting and sharing consumer data with consumers and third parties, and
  - Installing and supporting communication devices in and out of the homes.

## PRIVACY

Privacy and data security are fundamental issues that must be settled. Consumer trust is critical – if consumers believe they are being exploited, or their data are insecure, the smart grid and all associated benefits will continue to struggle.

- Virtually all say the consumer should “own” their data.
  - That said, it was pointed out that Colorado grants data ownership to the utility.
- All say consumer data must be protected with contemporary encryption and technology.
- Canada’s Privacy by Design is cited as a model for thinking about privacy.
  - Privacy by Design emphasizes a proactive approach to privacy, including a proactive approach to privacy, building it into the design of products and services, and an “out-of-the-box” privacy default setting in the “on” position. For more information regarding Privacy by Design, visit: <http://privacybydesign.ca/>
    - *“We build the data privacy into the technology. Through encryption the data stay secure and through access and authentication we limit who is eligible to see that data.” Global Manufacturer*
- Several say it may be best to have a nationwide privacy standard for all to align with.

## ADDITIONAL THOUGHTS

A thought-leader urges energy utilities to be flexible, and plan to accommodate disruptive innovation. American businesses and consumers are entrepreneurial, he says, and can be expected to develop devices and applications that will upset the best-laid plans of energy utilities. Utilities should expect this and be ready to adjust.

Thought-leaders comment that the US energy utility market is fragmented – there are many energy providers, each with its own approach to the smart grid and energy conservation. Some say this is a barrier; with so many opinions and approaches, it is challenging to build consensus, arrive at agreed upon standards, and so on.

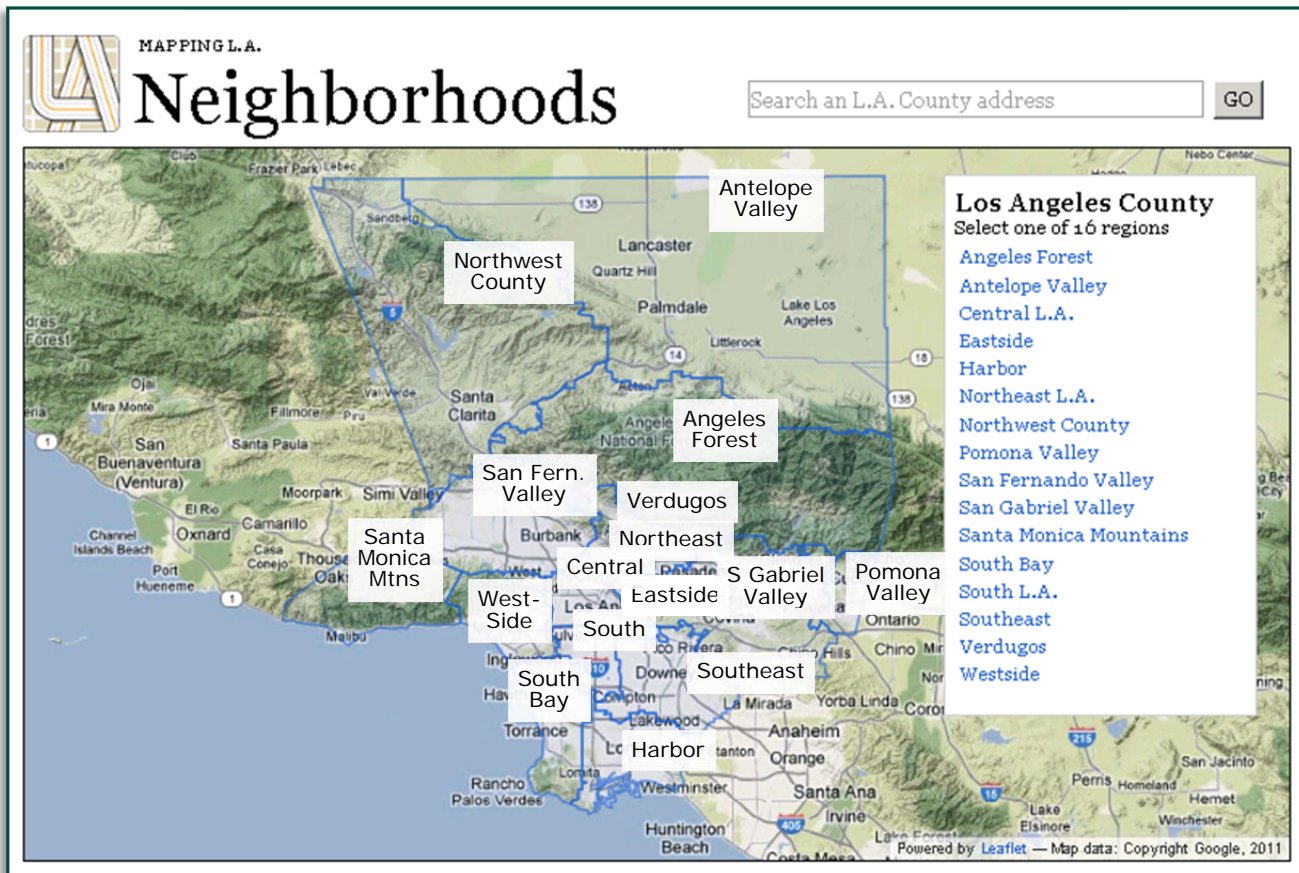
# APPENDIX C

## CONSUMER SURVEY DATA SEGMENTED BY SUB-REGION

Below, data is broken into geographic sub-regions within the counties of Los Angeles, Riverside, and San Bernardino.

The sub-regions were developed based on two sources:

- 1) The Los Angeles Times neighborhood mapping project - The Los Angeles Times noted a paucity of agreed-upon neighborhood boundaries across Los Angeles County and consequently developed its own map. It solicited reader input and modified boundaries based on that feedback. The result is an online interactive map (shown below) of the 16 regions of Los Angeles County.



<http://projects.latimes.com/mapping-la/neighborhoods/>

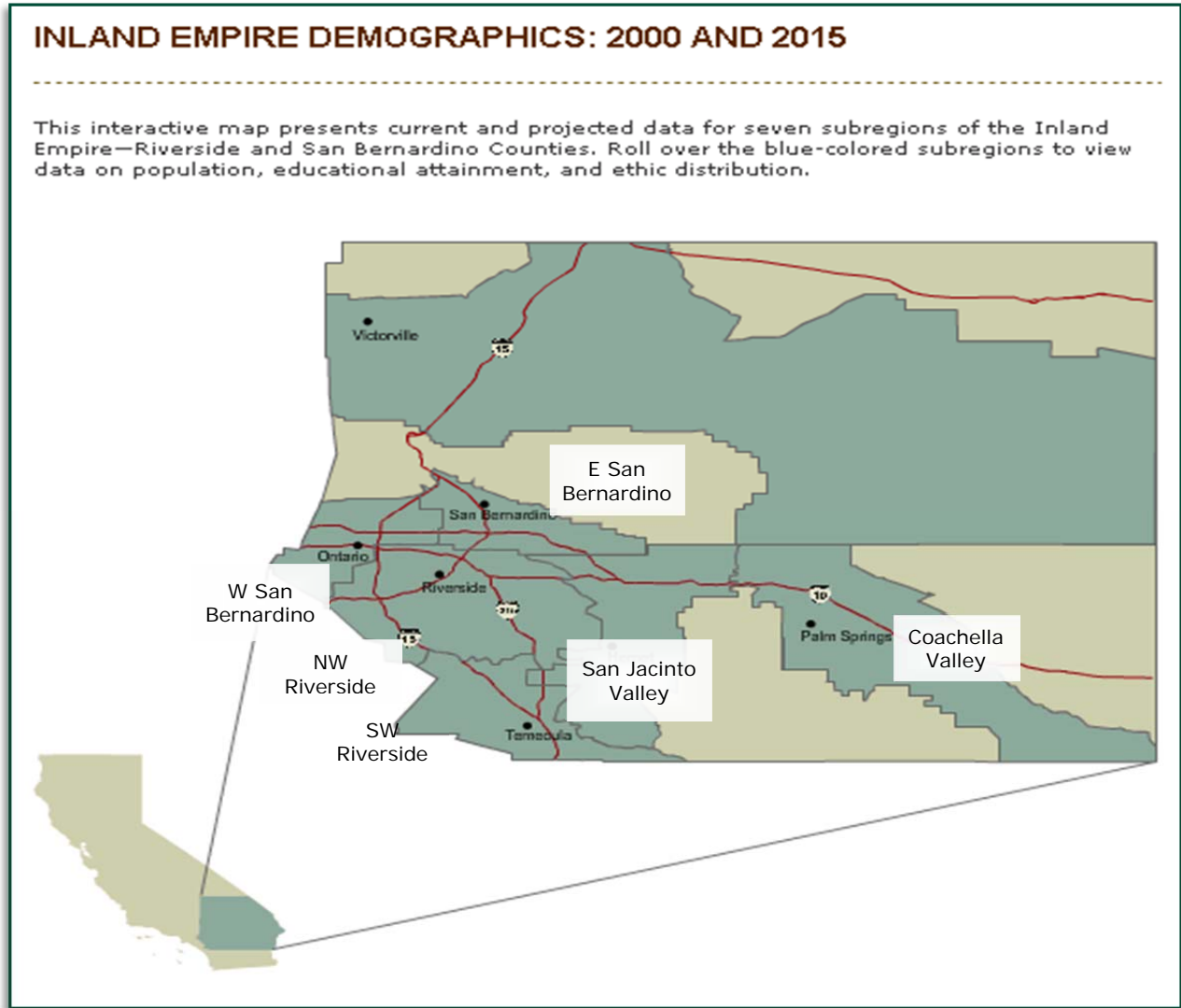
*Demographics of Los Angeles County*

Customer zip codes were manually coded to these sub-regions. Table 45 illustrates how Zanthus combined a number of The Los Angeles Times sub-regions to yield analyzable sub-regions. A number of sub-regions yielded no interviews, and are therefore not represented in the survey data. These regions are therefore omitted from the sub-regions.

**TABLE 45 ANALYZED SUB-REGIONS**

<b>The Los Angeles Times Regions</b>	<b>Combined Into These Sub-regions</b>
Antelope Valley	Antelope Valley
Central LA South Bay Westside	NW Side
Harbor Southeast	South LA
Pomona Valley San Fernando Valley San Gabriel Valley Verdugos	Valleys
Northwest County Santa Monica Mountains	West Mountains
Angeles Forest Eastside Northeast LA South LA	<b>Omitted</b> – no customer interviews from these <u>LA Times</u> sub-regions

- 2) The Public Policy Institute of California (PPIC) in 2008 generated a report entitled "The Inland Empire in 2015." The report web site includes an interactive map that divides Riverside and San Bernardino counties into logical sub-regions (shown below). Customer zip codes from survey data were manually coded to the PPIC regions.



*Demographics of Inland Empire*

<http://www.ppic.org/main/mapdetail.asp?i=824>

If desired, SCE can acquire complete sub-region zip code lists from the above sources.

**TABLE 46. HOUSEHOLD APPROACHES TO REDUCING ENERGY CONSUMPTION BY COUNTY AND SUB-REGION\***  
**Q14\_1 MULTIPLE RESPONSE ALLOWED, BASE N=606**

	Total	Los Angeles County and Sub Regions						Inland Empire Totals and Sub Regions									Other Counties		
		LA Co. Total	Antelope Valley	NWSide	So. LA	Valleys	West/ Mntains	Riverside Co. Total	Coachella Valley	S Jacinto Valley	NW Rivrside	SW Rivrside	San Ber Co. Total	Hi Desert	WSan Brnrdrino	E San Brnrdrino	Orange Co.	Ventura Co.	All Other Counties
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)
Total	606	222	20*	40	31	90	37	96	23*	16*	30	25*	75	18*	33	26*	132	55	26*
Self-managed conservation	77%	72%	82%	72%	75%	62%	83% E	79%	87%	81%	65%	81%	77%	73%	79%	81%	80%	78%	91% A
Purchase energy efficient products	68%	70%	51%	59%	74%	84% BCF	59%	71%	55%	87%	88% HMO	62%	61%	56%	72%	54%	62%	71%	80%
Participate in efficiency programs	39%	35%	36%	18%	41%	49% CF	17%	58% ALP	48%	56%	62% MO	66% MO	33%	26%	42%	22%	33%	40%	48%
None of these	2%	3%	10%	9%	0%	0%	2%	1%	0%	0%	3%	0%	0%	0%	0%	0%	2%	2%	0%
Count: 2-3 mentions	60%	57%	48%	44%	70% C	63%	51%	71% AL	55%	87%	85% HMO	65%	50%	42%	66%	40%	57%	66%	79% ALP
Count: only 1 mention (not including "none")	38%	40%	42%	47%	30%	37%	47%	28%	45%	13%	12%	35%	50%	58%	34%	60%	41%	33%	21%

- Valleys in LA County and NW Riverside in Riverside County appear more aggressive in how they approach reducing energy consumption compared to other sub-regions in their respective counties. These sub-regions are more likely than others to purchase energy efficient products.

\* Indicates small cell size; results should be considered directional.

Subscript letters in tables denote statistically significant differences between segments. In the table above, West/Mountain responses (column F) for “self-managed conservation” are statistically different from responses in column E, or responses from Valleys.

Summed totals in tables do not always equal 100% due to rounding.

**TABLE 47. PERMUTATIONS OF HOUSEHOLD APPROACHES TO REDUCING ENERGY CONSUMPTION BY COUNTY AND SUB-REGION  
Q14\_1 MULTIPLE RESPONSE ALLOWED, BASE N=606**

	Total	Los Angeles County and Sub Regions						Inland Empire Totals and Sub Regions									Other Counties		
		LA Co. Total	Antelope Valley	NW Side	So. LA	Valleys	West/Mntains	Riverside Co. Total	Coachella Valley	S Jacinto Valley	NW Riverside	SW Riverside	San Bern Co. Total	Hi Desert	W San Brnardino	E San Brnardino	Orange Co.	Ventura Co.	All Other Counties
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)
Total	606	222	20*	40	31	90	37	96	23*	16*	30	25*	75	18*	33	26*	132	55	26*
Purchase energy efficient products + Self-managed conservation	25%	25%	12%	26%	29%	20%	37%	19%	10%	38%	24%	12%	22%	19%	34% H	18%	32%	26%	32%
Participate in efficiency programs + Purchase energy efficient products + Self-managed	25%	23%	31%	14%	20%	33% F	10%	37% AP	35%	37%	33%	45% M	21%	13%	27%	17%	21%	25%	40%
Self-managed conservation ONLY	24%	21%	39% E	30% E	16%	7%	36% E	19%	42% J	0%	4%	19%	32%	40%	17%	46% JN	25%	27%	17%
Purchase energy efficient products ONLY	10%	16% GQ	3%	17%	14%	24% BF	7%	3%	0%	6%	7%	3%	12%	16%	8%	14%	8%	5%	3%
Participate in efficiency programs + Purchase energy efficient products	6%	6%	6%	2%	11%	8%	5%	11% P	10%	6%	24% KN	3%	6%	8%	4%	5%	2%	15% P	5%
Participate in efficiency programs ONLY	4%	3%	0%	0%	0%	6%	3%	6%	3%	7%	1%	13%	5%	2%	10%	0%	8%	0%	0%
Participate in efficiency programs + Self-managed conservation	2%	3%	0%	2%	11%	3%	0%	3%	0%	6%	3%	6%	2%	2%	2%	0%	2%	0%	3%
None of these	2%	3%	10%	9%	0%	0%	2%	1%	0%	0%	3%	0%	0%	0%	0%	0%	2%	2%	0%

- Valleys in LA County and SW Riverside in Riverside County are more likely than other segments to take all three approaches to reducing energy conservation, and more likely to purchase energy efficient products as their only action.
- Antelope Valley, West/Mountains, Coachella Valley, and East San Bernardino customers are more likely than others to only take self-managed measures.

\* Indicates small cell size; results should be considered directional.

**TABLE 48. MOTIVATIONS FOR ENERGY CONSERVATION BY COUNTY AND SUB-REGION\***  
**Q14\_2 MULTIPLE RESPONSE ALLOWED, BASE N=606**

	Total	Los Angeles County and Sub Regions						Inland Empire Totals and Sub Regions									Other Counties		
		LA Co. Total	Antelope Valley	NW Side	So. LA	Valleys	West/ Mntains	Riverside Co. Total	Coachella Valley	S Jacinto Valley	NW Riverside	SW Riverside	San Bern Co. Total	Hi Desert	W San Brnardino	E San Brnardino	Orange Co.	Ventura Co.	All Other Counties
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)
Total	606	222	20*	40	31	90	37	96	23*	16*	30	25*	75	18*	33	26*	132	55	26*
Low er monthly bill	97%	98%	100%	96%	100%	97%	100%	96%	90%	100%	97%	100% N	94%	100%	88%	97%	98%	100% GL	100% GL
Environmental concerns	47%	49%	32%	63%	51%	45%	47%	46%	55%	62%	38%	34%	43%	40%	57%	32%	49%	46%	45%
Utility-sponsored incentive program (e.g., rebates)	33%	30%	27%	29%	33%	37% F	15%	37%	23%	31%	51% O	40%	29%	21%	41% O	12%	35%	40%	31%
Something else	1%	0%	0%	2%	0%	0%	0%	3%	10%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%
None of these	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Count: 2-4 mentions	56%	59%	45%	66%	62%	58%	55%	56%	54%	68%	63%	46%	50%	50%	61%	36%	56%	57%	62%
Count: only 1 mention (not including "none")	43%	41%	55%	32%	38%	42%	45%	44%	46%	32%	37%	54%	50%	50%	39%	64%	44%	43%	38%

- Valleys in LA County, NW Riverside in Riverside County, and W San Bernardino in San Bernardino County are more likely than others to participate in utility-sponsored incentive programs.

\* Indicates small cell size; results should be considered directional.

**TABLE 49. PERMUTATIONS OF MOTIVATIONS FOR ENERGY CONSERVATION BY COUNTY AND SUB-REGION\***  
**Q14\_2 MULTIPLE RESPONSE ALLOWED, BASE N=606**

	Total	Los Angeles County and Sub Regions						Inland Empire Totals and Sub Regions									Other Counties		
		LA Co. Total	Antelope Valley	NW Side	So. LA	Valleys	West/Mntains	Riverside Co. Total	Coachella Valley	S Jacinto Valley	NW Riverside	SW Riverside	San Bern Co. Total	Hi Desert	W San Bernardino	E San Bernardino	Orange Co.	Ventura Co.	All Other Counties
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)
Total	606	222	20*	40	31	90	37	96	23*	16*	30	25*	75	18*	33	26*	132	55	26*
Lower monthly bill ONLY	41%	40%	55%	30%	38%	39%	45%	41%	37%	32%	37%	54%	44%	50%	27%	61% N	41%	43%	38%
Environmental concerns + Lower monthly bill	24%	29%	18%	37%	29%	21%	40%	19%	31% K	37%	12%	6%	21%	29%	19%	24%	22%	17%	32%
Environmental concerns + Utility-sponsored incentive program + Lower monthly bill	21%	19%	14%	24%	22%	22%	7%	23%	14%	25%	23%	29%	16%	10%	25% O	4%	26%	29%	13%
Utility-sponsored incentive program + Lower monthly bill	11%	11%	12%	5%	11%	16%	8%	13%	9%	6%	25%	12%	13%	10%	16%	7%	8%	11%	17%
Environmental concerns ONLY	2%	1%	0%	2%	0%	3%	0%	3%	10%	0%	0%	0%	6%	0%	12%	3%	1%	0%	0%
Utility-sponsored incentive program ONLY	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%
Environmental concerns + Utility-sponsored incentive program	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%
Other	1%	0%	0%	2%	0%	0%	0%	3%	10%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%
None of these	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

- East San Bernardino is significantly more likely to seek to lower their bill than West San Bernardino. Note: West San Bernardino is more distributed across the permutations than most other sub-regions.

\* Indicates small cell size; results should be considered directional.



**TABLE 50. ENERGY PROGRAM PARTICIPATION BY COUNTY AND SUB-REGION\*  
Q755, BASE N=559**

	Total	Los Angeles County and Sub Regions						Inland Empire Totals and Sub Regions									Other Counties		
		LA Co. Total	Antelope Valley	NW Side	So. LA	Valleys	West/Mntains	Riverside Co. Total	Coachella Valley	S Jacinto Valley	NW Riverside	SW Riverside	San Bern Co. Total	Hi Desert	W San Bernardino	E San Bernardino	Orange Co.	Ventura Co.	All Other Counties
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)
Total	559	199	19*	34	28*	80	35	91	22*	16*	28*	24*	71	18*	29*	25*	121	52	25*
Summer discount plan	31%	30%	26%	18%	30%	43% CF	17%	43% Q	50%	50%	34%	43%	36% Q	31%	51%	22%	28%	15%	23%
Energy efficiency program (e.g., bulb exchange)	29%	25%	37%	14%	36%	27%	16%	45% APQ	54% MO	31%	51% O	38%	32%	21%	51% MO	14%	26%	22%	27%
Refrigerator recycling program	22%	23%	26%	15%	20%	31%	17%	21%	20%	35%	7%	26%	20%	27%	23%	9%	22%	34% R	8%
Energy management service to track and lower energy bills	20%	11%	17%	6%	10%	13%	7%	39% APQR	48%	37%	40%	32%	35% AQR	23%	56% MO	18%	21% AQR	7%	3%
Equipment maintenance program	13%	10%	14%	4%	14%	12%	7%	21% R	30%	24%	26%	6%	16%	8%	28%	11%	10%	12%	3%
Renew able or clean energy program	6%	4%	3%	6%	0%	7%	0%	6%	11%	6%	4%	3%	12% A	8%	24% JK	0%	8%	4%	6%
None of these	39%	42% G	40%	61% DE	25%	29%	60% DE	22%	13%	26%	26%	23%	37%	42%	15%	63% HIJKN	44% G	48% G	41%

- NW Side and West/Mountain in LA County and East San Bernardino are least likely to participate in any of these programs, and might benefit most from an educational campaign.

\* Indicates small cell size; results should be considered directional.

**TABLE 51. ENERGY-EFFICIENT VEHICLES OWNED BY COUNTY AND SUB-REGION\*  
Q703, MULTIPLE RESPONSE ALLOWED, BASE N=606**

	Total	Los Angeles County and Sub Regions						Inland Empire Totals and Sub Regions									Other Counties		
		LA Co. Total	Antelope Valley	NW Side	So. LA	Valleys	West/ Mntains	Riverside Co. Total	Coachella Valley	S Jacinto Valley	NW Riverside	SW Riverside	San Bern Co. Total	Hi Desert	W San Bernardino	E San Bernardino	Orange Co.	Ventura Co.	All Other Counties
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)
Total	606	222	20*	40	31	90	37	96	23*	16*	30	25*	75	18*	33	26*	132	55	26*
Car, truck or SUV that gets at least 40 MPG on average	30%	29%	24%	22%	37%	39%	14%	19%	15%	12%	16%	28%	43%	45%	48%	28%	29%	29%	24%
Hybrid electric vehicle	4%	7% L	3%	13%	1%	5%	15%	2%	0%	6%	0%	3%	1%	0%	2%	1%	5%	3%	3%
Electric vehicle	1%	2%	0%	0%	0%	4%	0%	3%	3%	0%	7%	0%	0%	0%	0%	0%	1%	0%	0%
Electric-powered motorcycle, bike or scooter	1%	0%	0%	0%	0%	0%	2%	3%	0%	6%	0%	3%	0%	0%	0%	0%	2%	0%	3%
None of these	65%	64%	76%	67%	62%	55%	72%	75% L	82% N	76%	77%	66%	57%	55%	52%	71%	66%	67%	74%

- High Desert and West San Bernardino are more likely to use 40 MPG vehicles than other sub-regions, while Coachella Valley is least likely to use any of these.

**TABLE 52. REFRIGERATOR OWNED, BY COUNTY AND SUB-REGION\*  
Q711, BASE N=606**

Refrigerator	Total	Los Angeles County and Sub Regions						Inland Empire Totals and Sub Regions									Other Counties		
		LA Co. Total	Antelope Valley	NW Side	So. LA	Valleys	West/ Mntains	Riverside Co. Total	Coachella Valley	S Jacinto Valley	NW Riverside	SW Riverside	San Bern Co. Total	Hi Desert	W San Brnardino	E San Brnardino	Orange Co.	Ventura Co.	All Other Counties
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)
Total	606	222	20*	40	31	90	37	96	23*	16*	30	25*	75	18*	33	26*	132	55	26*
1	77%	79%	74%	79%	85%	78%	78%	76%	82%	75%	64%	79%	69%	69%	65%	79%	83%	69%	83%
2	20%	18%	23%	17%	10%	21%	20%	23%	18%	25%	36%	15%	31% P	31%	35%	21%	14%	23%	17%
3+ (NET)	3%	2%	3%	4%	5%	1%	2%	2%	0%	0%	0%	6%	0%	0%	0%	0%	4%	8%	0%

- NW Riverside and West San Bernardino have the greatest proportion of customers with more than one refrigerator.

**TABLE 53. RANGE OR COOKTOP OWNED, BY COUNTY AND SUB-REGION\*  
Q711, BASE N=606**

Range or cooktop	Total	Los Angeles County and Sub Regions						Inland Empire Totals and Sub Regions									Other Counties		
		LA Co. Total	Antelope Valley	NW Side	So. LA	Valleys	West/ Mntains	Riverside Co. Total	Coachella Valley	S Jacinto Valley	NW Riverside	SW Riverside	San Bern Co. Total	Hi Desert	W San Brnardino	E San Brnardino	Orange Co.	Ventura Co.	All Other Counties
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)
Total	606	222	20*	40	31	90	37	96	23*	16*	30	25*	75	18*	33	26*	132	55	26*
0	8%	12% GPQ	26%	15%	24% EF	5%	5%	6%	10%	0%	0%	10%	11%	19%	10%	1%	5%	2%	3%
1	91%	87%	72%	85%	73%	95% D	95% D	93%	90%	100%	100% K	87%	88%	81%	89%	99%	93%	96% A	97%
2	1%	1%	3%	0%	2%	0%	0%	1%	0%	0%	0%	3%	0%	0%	0%	0%	1%	2%	0%
3+ (NET)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	2%	0%	1%	0%	0%

- South LA has the greatest proportion with no range or cooktop.

\* Indicates small cell size; results should be considered directional.

**TABLE 54. OVEN (STANDALONE OR COMBINED WITH COOKTOP) OWNED, BY COUNTY AND SUB-REGION\* Q711, BASE N=606**

Oven (standalone or combined with cooktop)	Total	Los Angeles County and Sub Regions						Inland Empire Totals and Sub Regions									Other Counties		
		LA Co. Total	Antelope Valley	NW Side	So. LA	Valleys	West/ Mntains	Riverside Co. Total	Coachella Valley	S Jacinto Valley	NW Riverside	SW Riverside	San Bern Co. Total	Hi Desert	W San Brnardino	E San Brnardino	Orange Co.	Ventura Co.	All Other Counties
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)
Total	606	222	20*	40	31	90	37	96	23*	16*	30	25*	75	18*	33	26*	132	55	26*
0	6%	5%	0%	8%	11%	4%	1%	6%	3%	12%	5%	6%	6%	13%	4%	0%	10% Q	2%	5%
1	89%	89%	94%	91%	87%	87%	93%	87%	89%	88%	85%	87%	90%	87%	91%	93%	88%	94%	89%
2	5%	6%	6%	2%	2%	9%	7%	6%	6%	0%	10%	7%	4%	0%	5%	7%	2%	4%	6%
3+ (NET)	0%	0%	0%	0%	0%	0%	0%	1%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

**TABLE 55. DISHWASHER OWNED, BY COUNTY AND SUB-REGION\* Q711, BASE N=606**

Dishwasher	Total	Los Angeles County and Sub Regions						Inland Empire Totals and Sub Regions									Other Counties		
		LA Co. Total	Antelope Valley	NW Side	So. LA	Valleys	West/ Mntains	Riverside Co. Total	Coachella Valley	S Jacinto Valley	NW Riverside	SW Riverside	San Bern Co. Total	Hi Desert	W San Brnardino	E San Brnardino	Orange Co.	Ventura Co.	All Other Counties
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)
Total	606	222	20*	40	31	90	37	96	23*	16*	30	25*	75	18*	33	26*	132	55	26*
0	15%	20% GQ	19%	33%	22%	19%	0%	5%	3%	0%	18%	0%	13%	0%	16%	26% H	14% G	8%	17%
1	85%	79%	78%	66%	78%	81%	100% BCDE	95% AP	97% O	100%	82%	100% JNO	87%	100%	84%	74%	85%	87%	83%
2	1%	1%	3%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	6% AP	0%

- NW side and South. LA in LA County and East San Bernardino have relatively large populations with no dishwasher.

\* Indicates small cell size; results should be considered directional.

**TABLE 56. CLOTHES WASHER OWNED, BY COUNTY AND SUB-REGION\*  
Q711, BASE N=606**

Clothes washer	Total	Los Angeles County and Sub Regions						Inland Empire Totals and Sub Regions									Other Counties		
		LA Co. Total	Antelope Valley	NW Side	So. LA	Valleys	West/ Mntains	Riverside Co. Total	Coachella Valley	S Jacinto Valley	NW Riverside	SW Riverside	San Bern Co. Total	Hi Desert	W San Bernardino	E San Bernardino	Orange Co.	Ventura Co.	All Other Counties
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)
Total	606	222	20*	40	31	90	37	96	23*	16*	30	25*	75	18*	33	26*	132	55	26*
0	9%	12% GQ	10%	29% E	0%	10%	0%	4%	13%	0%	0%	0%	6%	0%	20%	0%	12% GQ	3%	5%
1	90%	88%	88%	69%	100% CE	90% C	100% CE	95% AP	87%	100%	100% N	97% N	94%	100%	80%	100% N	87%	95%	95%
2	1%	0%	3%	0%	0%	0%	0%	1%	0%	0%	0%	3%	0%	0%	0%	0%	1%	2%	0%
3+ (NET)	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%

- NW side in LA County and West San Bernardino has the largest proportions with no clothes washer or drier.

**TABLE 57. CLOTHES DRYER OWNED, BY COUNTY AND SUB-REGION\*  
Q711, BASE N=606**

Clothes dryer	Total	Los Angeles County and Sub Regions						Inland Empire Totals and Sub Regions									Other Counties		
		LA Co. Total	Antelope Valley	NW Side	So. LA	Valleys	West/ Mntains	Riverside Co. Total	Coachella Valley	S Jacinto Valley	NW Riverside	SW Riverside	San Bern Co. Total	Hi Desert	W San Bernardino	E San Bernardino	Orange Co.	Ventura Co.	All Other Counties
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)
Total	606	222	20*	40	31	90	37	96	23*	16*	30	25*	75	18*	33	26*	132	55	26*
0	10%	14% GLQ	10%	31%	0%	14%	0%	4%	13%	0%	0%	0%	6%	0%	20%	0%	12% GQ	3%	5%
1	89%	85%	86%	68%	100% CE	86%	100% CE	95% AP	87%	100%	100% N	97% N	93%	100%	78%	100% N	87%	95% A	95%
2	1%	0%	4%	0%	0%	0%	0%	1%	0%	0%	0%	3%	1%	0%	2%	0%	1%	2%	0%
3+ (NET)	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%

\* Indicates small cell size; results should be considered directional.

**TABLE 58. FURNACE OWNED, BY COUNTY AND SUB-REGION\***  
**Q711, BASE N=606**

Furnace	Total	Los Angeles County and Sub Regions						Inland Empire Totals and Sub Regions									Other Counties		
		LA Co. Total	Antelope Valley	NW Side	So. LA	Valleys	West/ Mntains	Riverside Co. Total	Coachella Valley	S Jacinto Valley	NW Riverside	SW Riverside	San Bern Co. Total	Hi Desert	W San Brnardino	E San Brnardino	Orange Co.	Ventura Co.	All Other Counties
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)
Total	606	222	20*	40	31	90	37	96	23*	16*	30	25*	75	18*	33	26*	132	55	26*
0	31%	37%	28%	54%	33%	27%	39%	25%	31%	18%	18%	27%	30%	34%	32%	28%	30%	16%	32%
1	67%	62%	69%	44%	67%	72%	56%	73%	69%	82%	79%	71%	66%	58%	68%	66%	67%	77%	68%
2	2%	2%	4%	2%	0%	1%	5%	1%	0%	0%	3%	0%	4%	8%	0%	7%	2%	6%	0%
3+ (NET)	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	3%	0%	0%	0%	0%	1%	2%	0%

- In the NW side of LA County, just over half do not have a furnace.

\* Indicates small cell size; results should be considered directional.

**TABLE 59. CENTRAL AIR CONDITIONING SYSTEM OWNED, BY COUNTY AND SUB-REGION\*  
Q711, BASE N=606**

Central air conditioning system	Total	Los Angeles County and Sub Regions						Inland Empire Totals and Sub Regions									Other Counties		
		LA Co. Total	Antelope Valley	NW Side	So. LA	Valleys	West/ Mntains	Riverside Co. Total	Coachella Valley	S Jacinto Valley	NW Riverside	SW Riverside	San Bern Co. Total	Hi Desert	W San Bernardino	E San Bernardino	Orange Co.	Ventura Co.	All Other Counties
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)
Total	606	222	20*	40	31	90	37	96	23*	16*	30	25*	75	18*	33	26*	132	55	26*
0	10%	15% LR	0%	42% DEF	8%	11% F	2%	0%	0%	0%	0%	0%	6%	2%	6%	11%	14% R	0%	3%
1	86%	81%	99% CE	56%	92% C	84% C	90% C	91%	89%	100%	92%	90%	89%	90%	90%	85%	83%	91%	95%
2	4%	3%	1%	2%	0%	5%	7%	8%	11%	0%	8%	7%	5%	8%	4%	3%	2%	9%	3%
3+ (NET)	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%	0%	3%	0%	0%	0%	0%	1%	0%	0%

- NW side of LA County also has the greatest proportion without central air conditioning

**TABLE 60. WINDOW AIR CONDITIONING UNIT OWNED, BY COUNTY AND SUB-REGION\*  
Q711, BASE N=606**

Window air conditioning unit	Total	Los Angeles County and Sub Regions						Inland Empire Totals and Sub Regions									Other Counties		
		LA Co. Total	Antelope Valley	NW Side	So. LA	Valleys	West/ Mntains	Riverside Co. Total	Coachella Valley	S Jacinto Valley	NW Riverside	SW Riverside	San Bern Co. Total	Hi Desert	W San Bernardino	E San Bernardino	Orange Co.	Ventura Co.	All Other Counties
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)
Total	606	222	20*	40	31	90	37	96	23*	16*	30	25*	75	18*	33	26*	132	55	26*
0	79%	73%	81% C	47%	84% C	72% C	97% CE	90% AP	94% N	68%	92% N	97% INO	77%	98%	64%	73%	77%	89% AP	88% A
1	17%	19% GR	12%	41% BDEF	7%	19% F	3%	9%	3%	32%	8%	3%	23% GR	2%	36% HJKM	27% HKM	21% GR	11%	3%
2	2%	4% P	4%	12% E	8%	1%	0%	1%	3%	0%	0%	0%	0%	0%	0%	0%	1%	0%	9%
3+ (NET)	1%	3%	3%	0%	0%	8%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%

- Rather than central air conditioning, many on the NW side of LA County rely on window air conditioning units.
- Apparently, some in valleys in LA County, San Jacinto in Riverside County, and East and West San Bernardino augment their central air with window air conditioners.

\* Indicates small cell size; results should be considered directional.

**TABLE 61. ELECTRIC WATER HEATER OWNED, BY COUNTY AND SUB-REGION\*  
Q711, BASE N=606**

Electric water heater	Total	Los Angeles County and Sub Regions						Inland Empire Totals and Sub Regions									Other Counties		
		LA Co. Total	Antelope Valley	NW Side	So. LA	Valleys	West/Mntains	Riverside Co. Total	Coachella Valley	S Jacinto Valley	NW Riverside	SW Riverside	San Bern Co. Total	Hi Desert	WSan Brnardino	E San Brnardino	Orange Co.	Ventura Co.	All Other Counties
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)
Total	606	222	20*	40	31	90	37	96	23*	16*	30	25*	75	18*	33	26*	132	55	26*
0	68%	69%	76%	77%	69%	63%	70%	69%	63%	76%	82%	61%	66%	50%	65%	93% HKMN	68%	59%	86% ALQ
1	31%	31%	24%	23%	31%	36%	29%	30%	34%	24%	18%	39% O	34% R	50%	35% O	7%	32%	39% R	14%
2	0%	0%	0%	0%	0%	1%	0%	1%	3%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%
3+ (NET)	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

- Two-thirds (68%) do not use electric water heaters.
- Greatest penetration of electric water heaters is in valleys in LA County, SW Riverside County, High Desert in San Bernardino County, and Ventura County.

**TABLE 62. THERMOSTAT OWNED, BY COUNTY AND SUB-REGION\*  
Q711, BASE N=606**

Thermostat	Total	Los Angeles County and Sub Regions						Inland Empire Totals and Sub Regions									Other Counties		
		LA Co. Total	Antelope Valley	NW Side	So. LA	Valleys	West/Mntains	Riverside Co. Total	Coachella Valley	S Jacinto Valley	NW Riverside	SW Riverside	San Bern Co. Total	Hi Desert	WSan Brnardino	E San Brnardino	Orange Co.	Ventura Co.	All Other Counties
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)
Total	606	222	20*	40	31	90	37	96	23*	16*	30	25*	75	18*	33	26*	132	55	26*
0	10%	14% Q	10%	43% BDEF	13%	7%	1%	0%	0%	0%	0%	0%	7%	8%	10%	0%	16% Q	5%	5%
1	83%	80%	81% C	51%	87% C	88% C	91% C	87%	86%	94%	85%	87%	86%	81%	87%	93%	80%	82%	89%
2	6%	4%	6%	2%	0%	6%	7%	12%	14%	6%	15%	9%	7%	10%	4%	7%	2%	11%	5%
3+ (NET)	1%	1%	3%	4%	0%	0%	1%	1%	0%	0%	0%	4%	0%	0%	0%	0%	2%	2%	0%

- NW side of LA County also has the greatest proportion that does not have a thermostat.

\* Indicates small cell size; results should be considered directional.



**TABLE 63. PLAN TO NEWLY ACQUIRE IN NEXT 12 MONTHS BY COUNTY AND SUB-REGION\*  
Q717B, NEW ACQUISITION WITHIN NEXT 12 MONTHS DOES NOT OVERLAP CURRENT OWNERSHIP**

	Total	Los Angeles County and Sub Regions						Inland Empire Totals and Sub Regions									Other Counties		
		LA Co. Total	Antelope Valley	NW Side	So. LA	Valleys	West/ Mntains	Riverside Co. Total	Coachella Valley	S Jacinto Valley	NW Riverside	SW Riverside	San Bern Co. Total	Hi Desert	W San Brnardino	E San Brnardino	Orange Co.	Ventura Co.	All Other Counties
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)
Total	606	222	20*	40	31	90	37	96	23*	16*	30	25*	75	18*	33	26*	132	55	26*
A home energy management app, program, device or system	10%	11%	22%	4%	15%	7%	18% C	12%	25%	0%	10%	6%	10%	0%	20% O	3%	6%	7%	12%
Energy-efficient lighting	9%	5%	3%	8%	2%	5%	9%	5%	0%	0%	19%	0%	17% AG	8%	23%	15%	13% AG	9%	9%
Home security system with alarm	8%	4%	3%	9%	5%	4%	0%	13% A	13%	26%	18%	3%	16% A	16%	23% K	0%	7%	0%	12%
A way to compare your energy usage to other homes	7%	7%	9%	4%	7%	11%	2%	3%	0%	7%	0%	6%	11% Q	8%	17%	3%	8% Q	2%	5%
Home control/automation system (for controlling lights, locks, thermostat and/or	7%	6%	3%	5%	7%	9%	2%	9%	6%	6%	21% KO	3%	9%	0%	18% K	3%	6%	7%	0%
Programmable thermostat	7%	6%	9%	5%	13%	4%	3%	5%	0%	0%	7%	13%	6%	0%	14%	0%	11%	5%	5%
High-efficiency home cooling system	6%	7% Q	3%	6%	8%	10%	2%	3%	0%	2%	7%	3%	14% GPQ	16%	24% IK	0%	5%	0%	5%
Energy Star appliance(s)	6%	6%	1%	2%	11%	10%	2%	8%	10%	0%	3%	13%	8%	2%	18%	0%	5%	2%	9%
High-efficiency home heating system	5%	6%	6%	3%	10%	6%	2%	1%	0%	0%	3%	0%	9% G	0%	20% JO	3%	4%	6% G	3%
None of these	64%	65%	69%	66%	62%	63%	61%	60%	53%	61%	61%	65%	59%	65%	40%	76%	64%	75%	63%

- West San Bernardino is more likely than most others to plan to acquire high efficiency cooling and heating, home automation, and home security.

**TABLE 64. APPLIANCE RETIREMENT ATTRIBUTED TO A UTILITY INCENTIVE PROGRAM BY COUNTY AND SUB-REGION\*  
Q716B, BASE N=572**

	Total	Los Angeles County and Sub Regions						Inland Empire Totals and Sub Regions									Other Counties		
		LA Co. Total	Antelope Valley	NW Side	So. LA	Valleys	West/ Mntains	Riverside Co. Total	Coachella Valley	S Jacinto Valley	NW Riverside	SW Riverside	San Bern Co. Total	Hi Desert	W San Brnardino	E San Brnardino	Orange Co.	Ventura Co.	All Other Counties
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)
Total	572	210	19*	37	30	86	35	88	19*	15*	29*	24*	70	17*	30	24*	126	52	26*
Yes	26%	24%	27%	16%	36%	29%	11%	27%	36%	19%	17%	32%	23%	19%	28%	24%	29%	33%	28%
No	74%	76%	73%	84%	64%	71%	89%	73%	64%	81%	83%	68%	77%	81%	72%	76%	71%	67%	72%

\* Indicates small cell size; results should be considered directional.

**TABLE 65. AWARENESS OF AND SUBSCRIPTION TO DYNAMIC PRICING BY COUNTY AND SUB-REGION\* Q723, BASE N=606**

	Total	Los Angeles County and Sub Regions						Inland Empire Totals and Sub Regions									Other Counties		
		LA Co. Total	Antelope Valley	NW Side	So. LA	Valleys	West/ Mntains	Riverside Co. Total	Coachella Valley	S Jacinto Valley	NW Riverside	SW Riverside	San Bern Co. Total	Hi Desert	W San Bernardino	E San Bernardino	Orange Co.	Ventura Co.	All Other Counties
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)
Total	606	222	20*	40	31	90	37	96	23*	16*	30	25*	75	18*	33	26*	132	55	26*
Never heard of it	26%	27%	25%	41%	30%	23%	19%	24%	45%	13%	13%	19%	31% Q	29%	37% J	29%	27%	14%	13%
Heard of it, but not much else	27%	26%	28%	22%	18%	28%	36%	30%	11%	24%	28%	54%	27%	37%	20%	22%	25%	39%	28%
Know something about it	32%	35%	44%	25%	48%	34%	32%	29%	17%	34%	48% H	21%	26%	26%	21%	34%	32%	34%	33%
Know a lot about it	11%	9%	1%	9%	5%	7%	13%	13%	24%	18%	4%	6%	11%	0%	16%	15%	12%	13%	24%
Currently subscribe to it	4%	4%	3%	2%	0%	8%	0%	4%	3%	12%	7%	0%	5%	8%	6%	0%	6%	0%	3%

**TABLE 66. LIKELIHOOD TO INVESTIGATE DYNAMIC PRICING FURTHER BY COUNTY AND SUB-REGION\* Q870, BASE N=583**

	Total	Los Angeles County and Sub Regions						Inland Empire Totals and Sub Regions									Other Counties		
		LA Co. Total	Antelope Valley	NW Side	So. LA	Valleys	West/ Mntains	Riverside Co. Total	Coachella Valley	S Jacinto Valley	NW Riverside	SW Riverside	San Bern Co. Total	Hi Desert	W San Bernardino	E San Bernardino	Orange Co.	Ventura Co.	All Other Counties
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)
Total	583	214	19*	39	31	84	37	91	22*	14*	28*	25*	73	17*	32	26*	125	55	25*
Top Two Box (6-7)	24%	22%	16%	25%	37%	18%	22%	29% R	54% IKO	10%	33%	9%	36% PR	40%	45% IKO	13%	20%	22%	8%
Middle Three Box (3-5)	68%	70%	70%	71%	61%	72%	74%	67%	44%	83%	58%	90% HJMN	59%	57%	49%	80% HN	69%	62%	86% L
Bottom Two Box (1-2)	8%	7%	14%	4%	2%	11%	5%	4%	3%	7%	9%	1%	5%	3%	6%	7%	11%	15%	5%

■ Coachella Valley in Riverside County and West San Bernardino are among the most likely to investigate dynamic pricing.

\* Indicates small cell size; results should be considered directional.

**TABLE 67. LIKELIHOOD TO SWITCH TO DYNAMIC PRICING BY COUNTY AND SUB-REGION\*  
Q725, BASE N=583**

	Total	Los Angeles County and Sub Regions						Inland Empire Totals and Sub Regions								Other Counties			
		LA Co. Total	Antelope Valley	NWSide	So. LA	Valleys	West/ Mntains	Riverside Co. Total	Coachella Valley	S Jacinto Valley	NW Riverside	SW Riverside	San Bern Co. Total	Hi Desert	W San Brnardino	E San Brnardino	Orange Co.	Ventura Co.	All Other Counties
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)
Total	583	214	19*	39	31	84	37	91	22*	14*	28*	25*	73	17*	32	26*	125	55	25*
Top Two Box (6-7)	30%	27%	15%	26%	53% BE	22%	26%	32%	46% O	15%	38%	22%	30%	23%	43% O	13%	33%	30%	30%
Middle Three Box (3-5)	64%	67%	65%	74%	47%	70%	71%	64%	48%	85%	53%	78% N	64%	75%	47%	83% HJN	59%	59%	65%
Bottom Two Box (1-2)	7%	6%	21%	0%	0%	8%	2%	4%	6%	0%	9%	0%	6%	3%	10%	3%	9%	11%	5%
Likely to Switch (5-7)	50%	52%	31%	52%	71% BE	45%	64%	55%	59%	30%	66% O	53%	45%	43%	52%	33%	48%	50%	50%
DISCOUNTED DEMAND (.77/.65/.45/.25/.1/.02/0)	40%	40%	29%	41%	52%	36%	42%	44%	46%	35%	46%	42%	39%	37%	44%	32%	39%	38%	39%

- South LA in LA County, Coachella Valley in Riverside County, and West San Bernardino are among the most likely to consider switching to dynamic pricing.

\* Indicates small cell size; results should be considered directional.

**TABLE 68. LIKELIHOOD TO INVESTIGATE DEMAND RESPONSE FURTHER BY COUNTY AND SUB-REGION\*  
Q872, BASE N=606**

	Total	Los Angeles County and Sub Regions						Inland Empire Totals and Sub Regions									Other Counties		
		LA Co. Total	Antelope Valley	NW Side	So. LA	Valleys	West/ Mntains	Riverside Co. Total	Coachella Valley	S Jacinto Valley	NW Riverside	SW Riverside	San Bern Co. Total	Hi Desert	W San Bernardino	E San Bernardino	Orange Co.	Ventura Co.	All Other Counties
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)
Total	606	222	20*	40	31	90	37	96	23*	16*	30	25*	75	18*	33	26*	132	55	26*
Top Two Box (6-7)	28%	32% PQR	15%	26%	52% B	33%	35%	35% PQR	33%	30%	31%	44%	35% PQR	35%	45% O	14%	19%	17%	11%
Middle Three Box (3-5)	56%	56%	72% D	69% D	37%	52%	49%	56%	59%	65%	54%	50%	50%	47%	50%	58%	60%	52%	60%
Bottom Two Box (1-2)	16%	12%	13%	5%	11%	15%	16%	9%	9%	6%	15%	6%	15%	19%	5%	28%	21% G	31% AG	30%

- South LA in LA County and West San Bernardino are among the most likely to investigate demand response.

**TABLE 69. DEMAND RESPONSE IMPORTANCE FACTORS BY COUNTY AND SUB-REGION\*  
SUMMARY TABLE OF TOP TWO BOX SCORES; Q861, BASE N=606**

	Total	Los Angeles County and Sub Regions						Inland Empire Totals and Sub Regions									Other Counties		
		LA Co. Total	Antelope Valley	NW Side	So. LA	Valleys	West/ Mntains	Riverside Co. Total	Coachella Valley	S Jacinto Valley	NW Riverside	SW Riverside	San Bern Co. Total	Hi Desert	W San Bernardino	E San Bernardino	Orange Co.	Ventura Co.	All Other Counties
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)
Total	606	222	20*	40	31	90	37	96	23*	16*	30	25*	75	18*	33	26*	132	55	26*
Access to control your home's appliances, devices and systems from any connected device (PC, phone, etc.)	38%	38%	32%	32%	52%	36%	45%	35%	33%	35%	45%	28%	43%	37%	58% K	32%	38%	35%	39%
A simple and intuitive way to interact with the program (to determine or override settings)	50%	50%	69% E	42%	62%	38%	68% E	49%	41%	53%	52%	50%	46%	31%	60%	35%	55%	48%	58%
Assurance that your household's energy usage information is privacy-protected	52%	46%	53%	31%	61% C	44%	46%	49%	38%	65%	61%	41%	54%	56%	63%	39%	56%	62%	59%

- Access from any connected device is of almost equal importance as other factors in West San Bernardino and So. LA.
- Simple and intuitive interaction with the program is important to more customers in Antelope Valley and West/Mountains in LA County.

\* Indicates small cell size; results should be considered directional.

**TABLE 70. AWARENESS AND USE OF HEMS BY COUNTY AND SUB-REGION\*  
Q747/745, BASE N=606**

	Total	Los Angeles County and Sub Regions						Inland Empire Totals and Sub Regions									Other Counties		
		LA Co. Total	Antelope Valley	NWSide	So. LA	Valleys	West/ Mntains	Riverside Co. Total	Coachella Valley	S Jacinto Valley	NW Riverside	SW Riverside	San Bern Co. Total	Hi Desert	W San Bmardino	E San Bmardino	Orange Co.	Ventura Co.	All Other Counties
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)
Total	606	222	20*	40	31	90	37	96	23*	16*	30	25*	75	18*	33	26*	132	55	26*
Never heard of it	44%	47%	50%	61%	38%	43%	50%	39%	41%	26%	38%	47%	34%	31%	29%	44%	45%	40%	58%
Heard of it, but not much else	39%	35%	37%	24%	41%	38%	28%	43%	26%	66%	50%	44%	46%	58%	39%	37%	35%	49%	37%
Know something about it	14%	14%	12%	15%	18%	10%	19%	17%	34% K	7%	12%	6%	14%	10%	14%	15%	17%	12%	5%
Know a lot about it	1%	1%	1%	0%	1%	0%	2%	0%	0%	0%	0%	0%	3%	0%	6%	0%	1%	0%	0%
HEMS already installed at home	2%	4%	0%	0%	2%	9%	0%	1%	0%	0%	0%	3%	4%	0%	12%	3%	2%	0%	0%

**TABLE 71. INTEREST IN USING IHED TO MONITOR AND REDUCE ENERGY CONSUMPTION BY COUNTY AND SUB-REGION\* Q955, BASE N=606**

	Total	Los Angeles County and Sub Regions						Inland Empire Totals and Sub Regions									Other Counties		
		LA Co. Total	Antelope Valley	NW Side	So. LA	Valleys	West/ Mntains	Riverside Co. Total	Coachella Valley	S Jacinto Valley	NW Riverside	SW Riverside	San Bern Co. Total	Hi Desert	W San Brnardino	E San Brnardino	Orange Co.	Ventura Co.	All Other Counties
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)
Total	606	222	20*	40	31	90	37	96	23*	16*	30	25*	75	18*	33	26*	132	55	26*
Top Two Box (6-7)	42%	44%	41%	31%	57%	38%	64% CE	43%	51%	41%	46%	34%	44%	35%	62% O	22%	38%	36%	34%
Middle Three Box (3-5)	49%	47%	47%	67% DF	35%	51%	23% F	50%	39%	59%	39%	66% N	44%	47%	35%	64%	52%	50%	55%
Bottom Two Box (1-2)	10%	9%	12%	2%	8%	11%	12%	7%	10%	0%	15%	0%	11%	19%	4%	15%	10%	14%	11%

- Interest in using IHED is greatest in West/Mountains of LA County, and West San Bernardino.

**TABLE 72. FEATURE IMPORTANCE OF IHED BY COUNTY AND SUB-REGION\* Q803, BASE N=606**

	Total	Los Angeles County and Sub Regions						Inland Empire Totals and Sub Regions									Other Counties		
		LA Co. Total	Antelope Valley	NW Side	So. LA	Valleys	West/ Mntains	Riverside Co. Total	Coachella Valley	S Jacinto Valley	NW Riverside	SW Riverside	San Bern Co. Total	Hi Desert	W San Brnardino	E San Brnardino	Orange Co.	Ventura Co.	All Other Counties
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)
Total	606	222	20*	40	31	90	37	96	23*	16*	30	25*	75	18*	33	26*	132	55	26*
Modes for "At home," "Night" and "Away"	19.9	17.9	19.5	18.1	18.3	16.4	20.3	21.4	27.4 IMO	13.0	24.0 IM	17.1	16.5	13.3	19.3	15.7	21.6 AL	25.3 AL	26.5 AL
Real-time energy pricing display	19.7	20.0	17.9	19.3	17.1	20.7	23.3	18.0	15.2	18.1	19.5	19.3	19.1	18.7	17.8	22.7	19.8	22.8	20.0
Tracking of energy usage for individual smart appliances and systems	16.7	16.7	17.1	17.2	15.4	17.0	16.7	15.5	14.5	16.9	14.3	17.2	16.7	18.2	18.1 O	10.7	18.8 Q	13.5	16.3
Automatic diagnostics	16.3	16.2	19.0	17.0	15.5	15.1	16.7	15.1	10.5	20.3	12.9	19.1 HJ	19.6 Q	18.4	15.9	28.3 HJN	16.5	13.3	13.7
Comparison of actual household energy usage to a household target	13.7	13.9	13.7	12.1	18.1 CF	14.8 F	9.7	15.8 P	14.9	17.3	14.2	17.3	14.2	14.5	15.5	11.0	12.2	13.3	11.9
Tailored recommendations	13.7	15.4 P	12.8	16.3	15.7	16.0	13.4	14.2	17.4	14.3	15.1	10.1	13.9	16.9	13.5	11.7	11.2	11.8	11.7

- Riverside County sub-regions Coachella Valley and NW Riverside place more importance than others do on "at home," "night" and "away" modes, along with Ventura and Other counties.
- East San Bernardino places greatest importance on appliance diagnostics.

\* Indicates small cell size; results should be considered directional.

**TABLE 73. IHED DESIGN IMPORTANCE FACTORS BY COUNTY AND SUB-REGION\***  
**SUMMARY TABLE OF TOP TWO BOX SCORES; Q860, BASE N=606**

	Total	Los Angeles County and Sub Regions						Inland Empire Totals and Sub Regions									Other Counties		
		LA Co. Total (A)	Antelope Valley (B)	NW Side (C)	So. LA (D)	Valleys (E)	West/Mntains (F)	Riverside Co. Total (G)	Coachella Valley (H)	S Jacinto Valley (I)	NW Riverside (J)	SW Riverside (K)	San Bern Co. Total (L)	Hi Desert (M)	W San Brnardino (N)	E San Brnardino (O)	Orange Co. (P)	Ventura Co. (Q)	All Other Counties (R)
Total	606	222	20*	40	31	90	37	96	23*	16*	30	25*	75	18*	33	26*	132	55	26*
Access to control your home's appliances, devices and systems from any connected device (PC, phone, etc.)	43%	43%	46%	40%	43%	36%	56%	41%	27%	53%	55%	37%	44%	37%	58%	24%	43%	42%	61%
A simple and intuitive way to interact with the program (to determine or override settings)	58%	59%	79%	65%	58%	43%	72%	54%	51%	47%	58%	56%	56%	37%	68%	57%	56%	66%	60%
Assurance that your household's energy usage information is privacy-protected	53%	50%	34%	53%	63%	50%	52%	44%	33%	65%	63%	27%	59%	48%	74%	44%	58%	60%	46%

- Access to IHED from any connected device is more important in West San Bernardino than most other sub-regions.
- Simple and intuitive interaction with the program is important to more customers in Antelope Valley, NW side and West/Mountains in LA County.
- Privacy protection is most important to West San Bernardino, and more important to NW Riverside than most other sub-regions.

\* Indicates small cell size; results should be considered directional.

**TABLE 74. APPEAL OF CONNECTED HOME BY COUNTY AND SUB-REGION\*  
Q14B, BASE N=606**

	Total	Los Angeles County and Sub Regions						Inland Empire Totals and Sub Regions									Other Counties		
		LA Co. Total	Antelope Valley	NW Side	So. LA	Valleys	West/ Mntains	Riverside Co. Total	Coachella Valley	S Jacinto Valley	NW Riverside	SW Riverside	San Bern Co. Total	Hi Desert	W San Bernardino	E San Bernardino	Orange Co.	Ventura Co.	All Other Counties
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)
Total	606	222	20*	40	31	90	37	96	23*	16*	30	25*	75	18*	33	26*	132	55	26*
Top Two Box (6-7)	47%	48%	56%	60%	63%	37%	45%	45%	45%	51%	50%	37%	46%	27%	64%	38%	50%	41%	32%
Middle Three Box (3-5)	46%	44%	44%	34%	28%	55%	39%	47%	39%	43%	39%	63%	46%	63%	35%	47%	40%	54%	66%
Bottom Two Box (1-2)	8%	8%	0%	6%	9%	8%	16%	9%	15%	6%	11%	0%	8%	10%	2%	15%	9%	5%	3%

■ The connected home concept is more appealing in LA County’s NW side, South LA, and in West San Bernardino.

**TABLE 75. LIKELIHOOD TO SETUP A CONNECTED HOME BY COUNTY AND SUB-REGION\*  
Q14C, BASE N=606**

	Total	Los Angeles County and Sub Regions						Inland Empire Totals and Sub Regions									Other Counties		
		LA Co. Total	Antelope Valley	NW Side	So. LA	Valleys	West/ Mntains	Riverside Co. Total	Coachella Valley	S Jacinto Valley	NW Riverside	SW Riverside	San Bern Co. Total	Hi Desert	W San Bernardino	E San Bernardino	Orange Co.	Ventura Co.	All Other Counties
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)
Total	606	222	20*	40	31	90	37	96	23*	16*	30	25*	75	18*	33	26*	132	55	26*
Top Two Box	65%	67%	79%	68%	77%	62%	67%	68%	73%	70%	59%	69%	63%	58%	65%	60%	66%	56%	55%
Middle Three Box	31%	29%	21%	32%	15%	36%	23%	24%	17%	18%	30%	31%	30%	34%	34%	25%	31%	43%	42%
Bottom Two Box	4%	3%	0%	0%	8%	2%	10%	8%	10%	12%	11%	0%	7%	8%	2%	15%	3%	2%	3%

■ There are no statistically significant differences by sub-region regarding likelihood to setup a connected home.

\* Indicates small cell size; results should be considered directional.



**TABLE 76. TYPES OF HVAC USED IN THE HOUSEHOLD BY COUNTY AND SUB-REGION\*  
Q707, BASE N=606**

	Total	Los Angeles County and Sub Regions						Inland Empire Totals and Sub Regions									Other Counties		
		LA Co. Total	Antelope Valley	NW Side	So. LA	Valleys	West/ Mntains	Riverside Co. Total	Coachella Valley	S Jacinto Valley	NW Riverside	SW Riverside	San Bern Co. Total	Hi Desert	W San Brnardino	E San Brnardino	Orange Co.	Ventura Co.	All Other Counties
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)
Total	606	222	20*	40	31	90	37	96	23*	16*	30	25*	75	18*	33	26*	132	55	26*
NET: Air conditioning	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Central air conditioning	90%	85%	100% CDE	56%	92% C	89% C	98% CE	100% ALP	100% O	100%	100% O	100% O	94% A	98%	94%	89%	86%	100% ALP	97% AP
Window air conditioning units	12%	19% GLQ	13%	45% BDEF	11%	14% F	2%	2%	3%	0%	1%	3%	7%	2%	6%	15%	15% GQ	2%	12%
Central forced air heating	67%	60%	79% C	41%	60%	59%	74% C	75% A	65%	62%	86% N	82% N	65%	77%	49%	67%	66%	78% A	82% A
Wood, pellet, or gas stove	7%	7%	15%	9%	11%	4%	1%	5%	3%	0%	15%	3%	5%	2%	8%	3%	10%	0%	8%
Baseboard heat (electric)	5%	10% P	3%	9%	19%	10%	0%	0%	0%	0%	0%	0%	6%	8%	10%	0%	2%	0%	0%
Radiant heat, or radiators	3%	4%	0%	13%	0%	3%	2%	3%	0%	0%	11%	0%	1%	0%	2%	0%	2%	0%	0%
Heat pump	2%	1%	0%	2%	2%	1%	1%	3%	0%	6%	3%	6%	4%	5%	0%	11%	2%	0%	0%
Solar	1%	0%	0%	0%	2%	0%	1%	1%	3%	0%	1%	0%	4%	0%	8%	0%	1%	0%	0%
Other	2%	3%	3%	3%	11%	0%	0%	1%	0%	0%	0%	3%	2%	2%	2%	3%	1%	2%	15%

- The greatest concentration of window air conditioning units is on the NW side of LA County, where many are also renters.

\* Indicates small cell size; results should be considered directional.

**TABLE 77. TYPE OF RESIDENCE BY COUNTY AND SUB-REGION\*  
Q101, BASE N=606**

	Total	Los Angeles County and Sub Regions						Inland Empire Totals and Sub Regions									Other Counties		
		LA Co. Total (A)	Antelope Valley (B)	NWSide (C)	So. LA (D)	Valleys (E)	West/ Mntains (F)	Riverside Co. Total (G)	Coachella Valley (H)	S Jacinto Valley (I)	NW Riverside (J)	SW Riverside (K)	San Bern Co. Total (L)	Hi Desert (M)	WSan Brnardino (N)	E San Brnardino (O)	Orange Co. (P)	Ventura Co. (Q)	All Other Counties (R)
Total	606	222	20*	40	31	90	37	96	23*	16*	30	25*	75	18*	33	26*	132	55	26*
Single-family house	70%	66% P	82% CF	48%	77% CF	73% CF	46%	79% AP	38%	100%	93% HN	97% HN	85% AP	98%	70% H	85% H	52%	73% P	97% AGPQ
MULTI-FAMILY HOUSING (NET)	28%	31% LR	15%	48% BE	23%	26%	44% B	20% R	62% JNO	0%	7%	0%	14%	0%	30% J	11%	45% AGLQR	19% R	3%
Apartment	13%	16% GLQR	10%	29% D	8%	15%	15%	8%	22% J	0%	3%	0%	7%	0%	16%	11%	19% GLQR	6%	3%
Condominium	15%	15%	6%	19%	15%	11%	29% BE	13%	39% J	0%	4%	0%	7%	0%	14%	0%	26% GL	13%	0%
Co-op	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Townhouse	1%	3%	3%	4%	0%	1%	8% E	0%	0%	0%	0%	0%	1%	0%	0%	3%	1%	2%	0%
Other	1%	0%	0%	0%	0%	0%	2%	1%	0%	0%	0%	3%	1%	2%	0%	0%	2%	6% AG	0%

- The greatest concentration of apartment dwellers is on the NW side of LA County and in the Coachella Valley in Riverside County.
- The greatest concentration of condo dwellers is on the West/Mountains in LA County, Coachella Valley in Riverside County, and in Orange County.

**TABLE 78. OWN VS. RENT BY COUNTY AND SUB-REGION\*  
Q102, BASE N=606**

	Total	Los Angeles County and Sub Regions						Inland Empire Totals and Sub Regions									Other Counties		
		LA Co. Total (A)	Antelope Valley (B)	NWSide (C)	So. LA (D)	Valleys (E)	West/ Mntains (F)	Riverside Co. Total (G)	Coachella Valley (H)	S Jacinto Valley (I)	NW Riverside (J)	SW Riverside (K)	San Bern Co. Total (L)	Hi Desert (M)	WSan Brnardino (N)	E San Brnardino (O)	Orange Co. (P)	Ventura Co. (Q)	All Other Counties (R)
Total	606	222	20*	40	31	90	37	96	23*	16*	30	25*	75	18*	33	26*	132	55	26*
Own	73%	71%	59%	50%	87% BC	75% C	85% BC	82% AP	72%	94%	82%	84%	77%	73%	79%	71%	65%	87% APR	63%
Rent	27%	29% GQ	41% DF	50% DEF	13%	25%	15%	18%	28%	6%	18%	16%	23%	27%	21%	29% I	35% GQ	13%	37% Q

- The greatest concentration of renters is in the Antelope Valley and NW side of LA County and Orange County.

\* Indicates small cell size; results should be considered directional.

## RESIDENTIAL ENERGY CONCEPT DESCRIPTIONS

### Dynamic Pricing:

Some utilities charge a **lower** price for energy use at off-peak times of the day (when demand is lowest), and a **higher** price for energy at peak times (when demand is highest). This is sometimes called **dynamic pricing**.

Assume dynamic pricing includes a mechanism that works much like a programmable thermostat – the mechanism can be set to automatically time-shift energy usage of appliances that always run (e.g., a water heater or refrigerator).

### Demand Response:

Some energy providers offer a program called Demand Response.

Under this type of program, you would pay lower rates for energy in exchange for allowing your electric utility or energy provider to adjust your home's heating or cooling settings during peak usage periods, automatically.

In addition, the electric utility could postpone running certain appliances (such as a dishwasher) in your home during peak periods. You can override these actions by your provider, if desired.

There is no fee charged for signing up with this type of program.

### Smart Appliances:

Smart appliances connect to the Internet wirelessly, allowing you to view information about cycle status (for example, time remaining until dishes are done), energy consumption, and maintenance needs from an Internet-connected device like a phone or PC.

You may also be able to control or monitor the appliance from your cell phone or other Internet-connected device.

'Smart' appliances are designed to save energy. They can be linked with smart meters to automatically avoid peak energy rates by delaying start times until rates are low.

### Home Energy Management System:

A Home Energy Management System (HEMS) provides detailed reports about your home's energy usage. It can list energy use by individual devices, appliances, and home systems, and offer suggestions to reduce your home's energy consumption and energy bill. Ultimately, the HEMS device provides consumers with information so they are better prepared to make decisions regarding their household's energy consumption.

Depending on your preferences, it can be set up to minimize your energy bill by automatically running certain appliances only when rates are low. Much like a programmable thermostat, you can change settings as much or as little as you like.

Sometimes, HEMS is offered with a specific device like a touch-screen panel called an In-Home Energy Display System, or it may be accessible from any Internet-connected device, including a PC or smartphone.

## **In-Home Energy Display (IHED):**

### **Introduction:**

**This In-Home Energy Display (IHED)** device enables you to more easily visualize and control your home's systems and appliances while tracking your energy usage.

You can access the IHED using the device's touch screen, or by secure website from any Internet-connected device, including a PC or smartphone. It can be accessed while you are at home or away from home. You enter a login and password to access your personalized portal with your household information.

The IHED displays data about your home's energy usage from a smart meter, as well as any connected appliances you have in your home.

### **Features include:**

- **Modes for "At home," "Night" and "Away"** so you can easily adjust light, smart appliance and temperature settings all at once from your PC, smartphone, or other Internet-connected device
- **Automatic diagnostics**, including notifications of any maintenance or repair needs for your home's connected appliances and systems, including heating, air conditioning and cooling
- **Comparison of actual household energy usage to a household target** on a daily, weekly and monthly basis
- **Tracking of energy usage** for individual smart appliances and systems (including heating and air conditioning) on a daily, weekly and monthly basis
- **Real-time energy pricing display** that shows current price per kilowatt hour (kWh) for homes that use dynamic pricing
- **Tailored recommendations** for meeting your home's energy goals

Remember, depending on your preferences, it can be set up to minimize your energy bill by automatically running certain appliances only when rates are low, and much like a programmable thermostat, you can change settings as much or as little as you like.

The IHED may be made available through various retail outlets.

### **Description of additional details:**

The **In-Home Energy Display (IHED)** could communicate energy usage a number of ways – we'd like to understand your preferences.

The in-home display could show the amount of energy being consumed in several ways, including ...

- Across the entire house,
- By separate circuits (e.g., the laundry room, kitchen, TV room), or ...
- By device or appliance (e.g., the refrigerator, TV, oven, etc.).

It may display energy consumption in the following increments:

- Real time/near real time
- 10 minutes
- 60 minutes
- 24 hours / once a day
- Weekly

- **Monthly**

The display may show energy use in two ways –

- **Trending** – your household’s energy usage from a point in time going forward (e.g., from 6 a.m. until 5 p.m.)
- **Comparative** – your household’s usage compared to a benchmark (e.g., your household compared to an average consumer in your zip code, or against your household’s daily average)

Displaying energy consumption information can help you understand how energy is used in your home. This information can help you reduce energy consumption thereby reducing your monthly energy bill.

For example, when the IHED is first installed, you may want to see detailed energy usage to learn what uses the most energy and when. In this scenario, you may prefer to see energy consumption

...

- By devices and appliances
- Displayed in real time
- Shown as a trend

This would show what drives energy consumption in your home.

## DISCOUNTED DEMAND CALCULATION

Data regarding likelihood to switch or subscribe to a program are expressed as “discounted.” That is to say, these data are discounted to compensate for likely overstatement. The discount calculation is defined below.

In a number of cases, discounted likelihood is actually greater than the undiscounted percentage likely (referred to as 6-7 rating, or top two box). This typically is due to a large proportion of customers rating their likelihood in the neutral range of the scale (e.g., 3-5 on a seven-point scale), thereby increasing discounted demand.

### EQUATION 1. DISCOUNTED DEMAND

$$\text{DISCOUNTED DEMAND} = (77\% * \% \text{ RATING LIKELIHOOD TO PURCHASE A "7" (I.E., "DEFINITELY SWITCH") ON A 1-7 LIKELIHOOD TO PURCHASE SCALE}) + (65\% * \% \text{ RATING LIKELIHOOD TO PURCHASE A "6"}) + (45\% * \% \text{ RATING LIKELIHOOD TO PURCHASE A "5"}) + (25\% * \% \text{ RATING LIKELIHOOD TO PURCHASE A "4"}) + (10\% * \% \text{ RATING LIKELIHOOD TO PURCHASE A "3"}) + (2\% * \% \text{ RATING LIKELIHOOD TO PURCHASE A "2"}) + (0\% * \% \text{ RATING LIKELIHOOD TO PURCHASE A "1" (I.E., "DEFINITELY WILL NOT SWITCH")})$$

- Those who definitely would switch equal 77% (e.g., likelihood to switch or subscribe rated “7” (i.e., “definitely switch”) on a seven-point scale) actually do switch
- 65% whose likelihood to switch is “6” actually switch
- 45% whose likelihood to switch is “5” actually switch
- 25% whose likelihood to switch is “4” actually switch
- 10% whose likelihood to switch is “3” actually switch
- 2% whose likelihood to switch is “2” actually switch
- 0% whose likelihood to switch is “1” actually switch

## DATA WEIGHTS

As noted in the Methodology, survey data have been weighted to more accurately represent the population from which the sample was drawn.

In this case, survey respondent demographics (including gender, age, household income, and presence of children) were compared to US Census data for the counties included in the study.

The comparison showed that upper income customers were over-represented in the survey data compared to the population, and lower income customers were under-represented. Consequently, a mathematical formula was applied to the data to “down weight” upper income customer responses, and “up weight” lower income customer responses.

Table 79 illustrates the “Observed” proportions of the population (based on US Census data), the “Unweighted Survey” frequencies and proportions (%), and the “Weight Factors” derived. Total data and all segment data included in the report are weighted by these values.

**TABLE 79. OBSERVED PROPORTIONS OF THE POPULATION**

<b>Income</b>	<b>Observed %</b>	<b>Unweighted Survey Frequency</b>	<b>Unweighted Survey %</b>	<b>Weight Factor</b>	<b>Weighted Frequency</b>	<b>Weighted %</b>
<b>Refused</b>	2.0%	62	10.2%	0.1955	12.1	2.0%
<b>&lt; \$50,000</b>	42.6%	100	16.5%	2.5805	258.1	42.6%
<b>\$50,000 &lt; \$99,999</b>	30.1%	242	39.9%	0.7546	182.6	30.1%
<b>\$100,000 or more</b>	25.3%	202	33.3%	0.7585	153.2	25.3%
<b>Total</b>	100.0%	606	100.0%		606.0	100.0%

The calculation to derive these “Weight Factors” is shown in Equation 2.

**EQUATION 2. DATA WEIGHT FACTORS**

Observed % (Census data %) divided by Survey % (Survey data)

= Weight Factor. (Weight factors shown in the table above may differ slightly due to rounding, since the percentages actually used to compute the weights include additional decimal places.)

These weight factors are applied at the individual respondent level among those who fit the income criteria associated with a weight. For example, a single customer with income under \$50,000 per year appears in the final tabulated data as representing 2.5805 customers.

The “Weighted Survey %” functions as confirmation that the “Weight Factor” multiplied by the “Unweighted Survey %” equals the “Weighted Frequency” (which corresponds to “Observed” US Census data).

# ATTACHMENTS

## 1. Future Outlook for Residential Energy Management –Questionnaire



SCE Customer Web  
Survey Questionnaire

## 2. Future Outlook for Residential Energy Management – Consumer Research Topline Report



SCE Consumer  
Research Topline Rep

## 3. Future Outlook for Residential Energy Management – Industry Perspectives Research Topline Report



SCE Industry  
Perspectives Topline I

## 4. Connected Home Concept Communicated to Customers in the Survey



SCE slideshow  
102111.pptx