Summary Findings

Northwest Utility

Prepay Study

May 21st, 2014

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National Town Meeting DR & Smart Grid

DEFG
Consumer • Energy • Performance

Background



- DEFG was asked to conduct a data evaluation study to analyze the potential energy conservation impact that can result from prepayment of electricity service. The study was to focus on a group of utilities in the Northwest that had been offering prepaid electricity services to customers.
- The study involved two core components: A Conservation Impact Study evaluating the usage data from customers enrolled in prepay programs to identify potential energy savings impacts from participation; and a Customer Survey that surveyed customers who were participating in the prepay programs to better understand their perspective and behaviors related to the prepay service.
- The study included two cooperatives in the Northwest that have prepayment service programs in place, Glacier Electric Cooperative in Cut Bank, Montana and Peninsula Light Company in Gig Harbor, Washington.
- Glacier Electric had approximately 1,250 customers enrolled in its prepay program at the time of the study, or 25% of its 5,100 customer base. Glacier's program has been in existence since 2009.
- Peninsula Light Company has approximately 170 customers enrolled in its prepay program at the time of the study. The prepay program started in February 2013 as a pilot program and was available only to a small percentage of its approximately 30,000 customers. PenLight started to expand its prepay program to all customers in September 2013.

Conservation Impact Study - Methodology



- The methodology was presented in a white paper, *A Method for Estimating the Conservation Effects of Energy Prepayment* (DEFG 2011) http://defgllc.com/publication/method-for-estimating-the-conservation-effects-of-energy-prepayment/
- Fundamental approach: utilized customer billing data during post-pay and prepay periods to determine usage changes
  - A monthly fixed-effects panel model was used. The Model controlled for the following:
    - Difference in average usage across customers (fixed-effect)
    - Effects that vary over time but are constant across customers (time-effects)
    - Temperature and dew-point influences
- *The data set*:
  - Monthly consumption data for a total of 1,394 households
    - 1,204 from Glacier and 154 from PenLight
    - Average of 11 months under post-pay and 10 months under pre-pay
    - Latest data October 2013
  - Weather data (temperature) by zip code covering post-pay and prepay periods
  - Disconnection data for each customer under post-pay and prepay (count of disconnects each month)

Summary Results

Conservation Impact Study

- Methodology – regression analysis that utilized customer billing data during post-pay and prepay periods to determine usage changes, while holding other non-weather dependent variables constant
- **For Glacier, enrollment in prepay results in an average savings of 14.0%**
  - 95% confidence interval goes from savings of 10.4% to 17.5%
- **For PenLight, the average savings from prepay is 5.5%**
  - 95% confidence interval goes from savings of 1.6% to 9.5%

Interpretation of Results



- **For Glacier, enrollment in prepay results in an average savings of 14.0%**
  - 95% confidence interval goes from savings of 10.4% to 17.5%
  - Disconnection under *post-pay* results in a *decrease* in energy use for that month
  - Under *prepay*, a disconnect is associated with an *increased* use of electricity
  - Possible reason is that under prepay, customers have knowledge of their current bill, so if the bill is higher than expected, the customer will choose to disconnect to manage their bill
- **For PenLight, the average savings from prepay is 5.5%**
  - 95% confidence interval goes from savings of 1.6% to 9.5%
  - The coefficients of both disconnect variables are statistically insignificant, thus no definitive conclusions can be drawn on the size or magnitude of these terms

Customer Survey - Overview



- DEFG surveyed prepay customers of both cooperatives who were enrolled in a prepay service and were part of the conservation impact study to explore the pros and cons of prepayment solutions, and shed light on why and how prepay customers reduce their energy usage.
- The survey asked questions related to potential behavioral changes and actions a customer may have taken since enrolling in a prepay service. The goal was to try and better understand the drivers, the behavioral aspects and specific steps that customers may take to reduce their energy usage as a result of being on prepay.
- Customers invited to participate in the survey were from the same households as those whose usage data was analyzed in the conservation impact study.
- Utilities provided data, including telephone numbers, for 1172 prepay service accounts. Customers were provided with advance notification of the survey. There were 112 telephone interviews completed. Based on eligible customers the response rate was 13%.

Summary Results

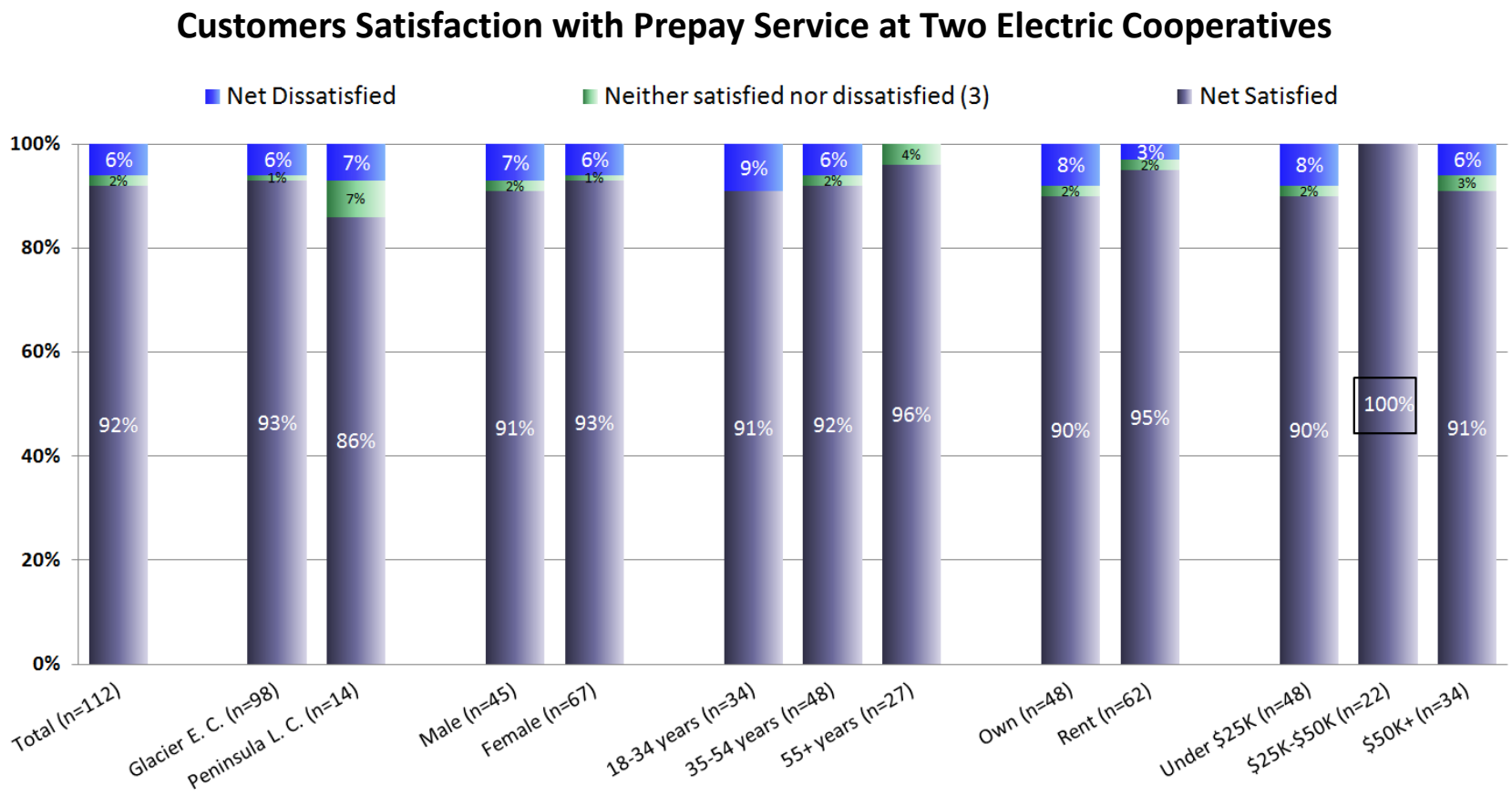


Consumer Survey

- Developed telephone survey for both Glacier and PenLight members who were on prepay service; 112 responses in total, most from Glacier members.

- Survey results indicated the following:
  - There are high levels of satisfaction with prepay service
  - Three-out-of-four customers say they have changed usage behavior
  - 92% of customers indicated they made a conscious effort to reduce electricity
  - Customers across all demographic categories allow their electricity to be shut off to manage electric costs
  - Awareness and information are driving behavioral changes as 90% of customers indicated they had made some type of behavioral change since switching to prepay service
  - Customers switch to prepay service for control, budgeting and cash allocation
  - Customers want choices as it relates to communication channels, payment options, and type of information received
  - The personalization of information to each customer and residence is important

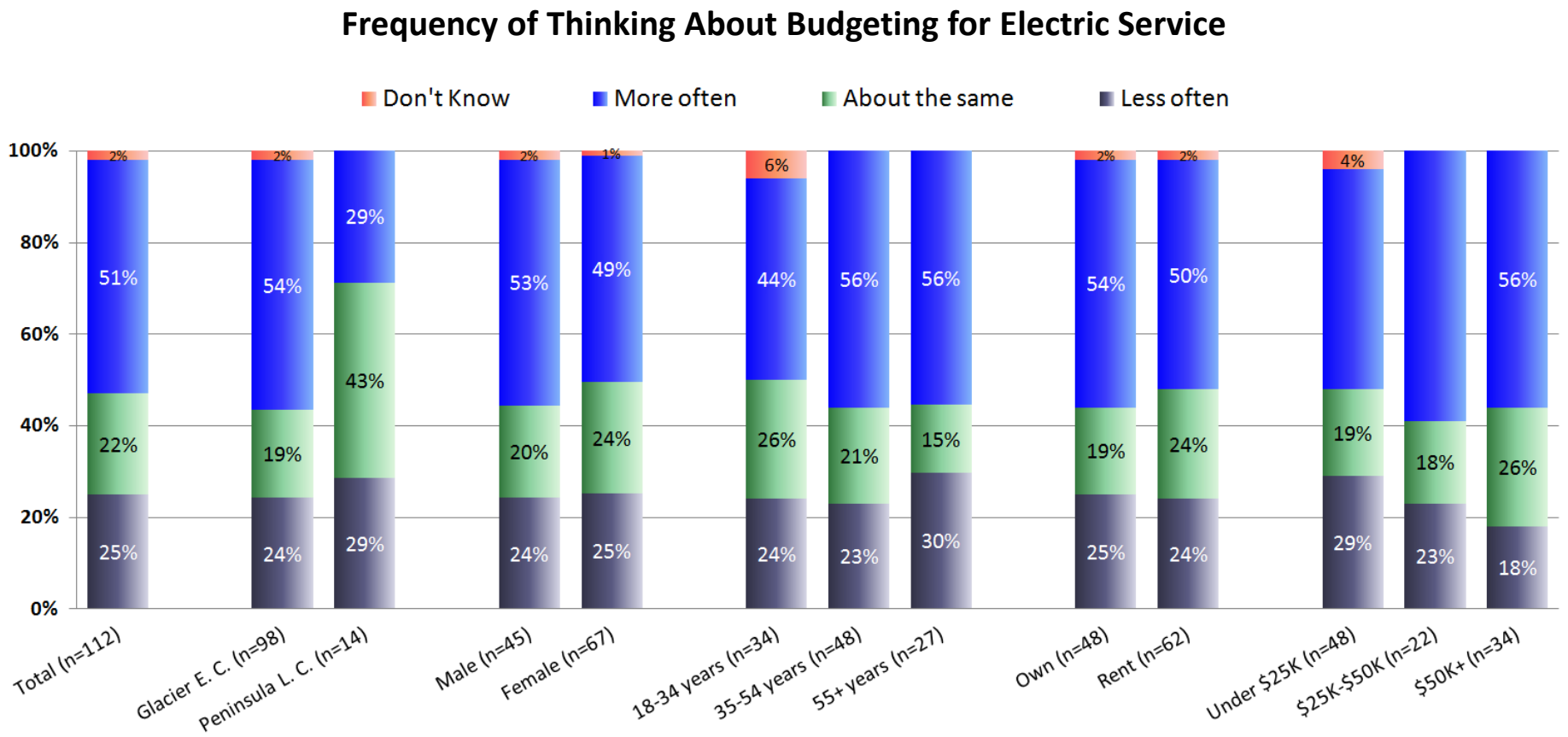
There Are High Levels of Satisfaction with Prepay Service



- **Ninety-two percent of customers on prepay service are either "very satisfied" or "somewhat satisfied." This follows the findings of DEFG's national surveys on prepay.**
- **Given the large percentage of respondents with income levels less than $25K or in $25K-$50K range, the high levels of satisfaction may help address the perception of the appropriateness of voluntary prepay service for lower income consumers.**

Q1. How satisfied are you with your prepay service? (List of five choices.)

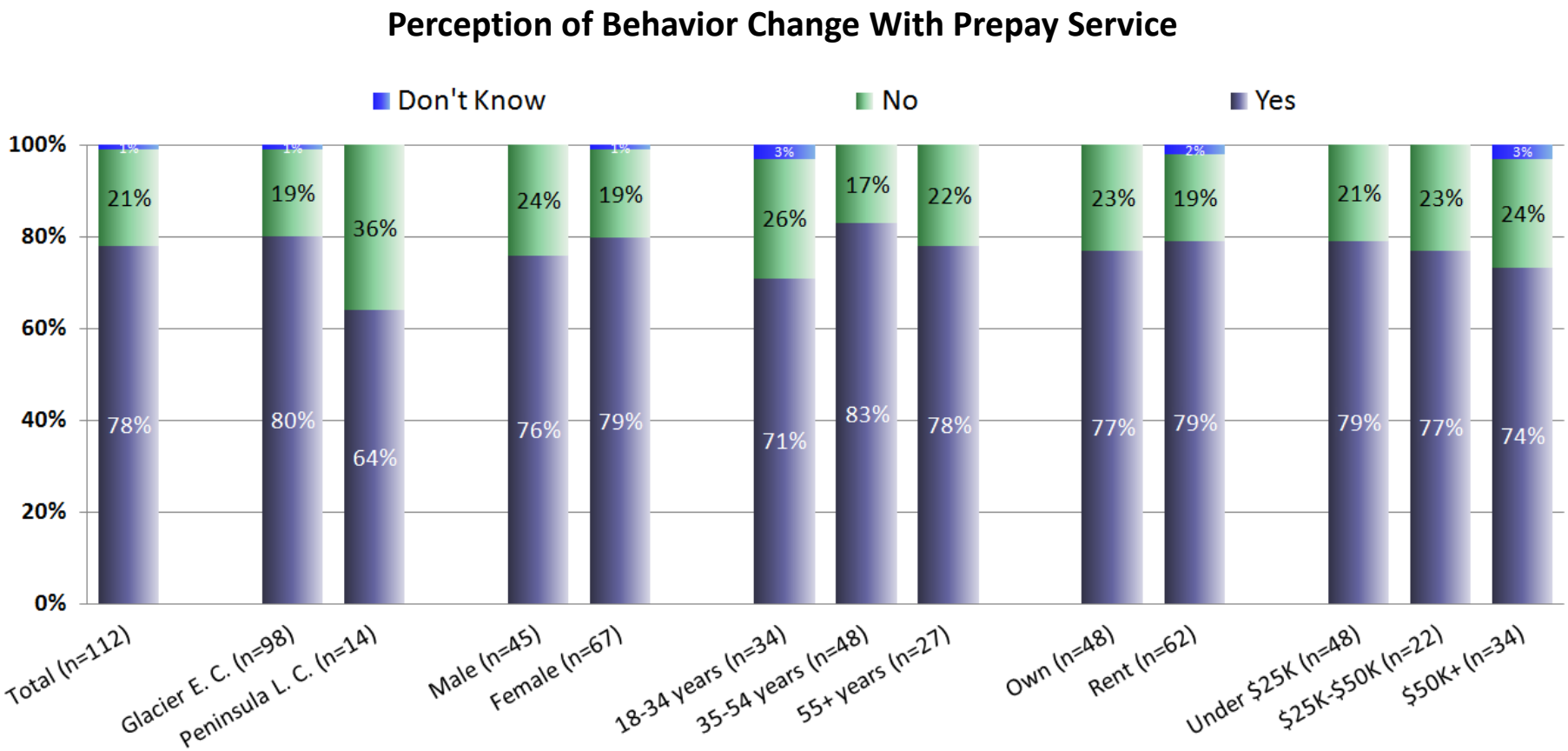
One Half of Prepay Service Customers Now Think More Often About Budgeting



- 51% of respondents indicated that they think more often about budgeting for electricity since they switched to prepay service
- 25% indicated they thought less often about budgeting
- Responses are consistent across categories
- Do regular updates reduce the level of worrying about the electric bill and reduce the thought about budgeting?

Q3. Since you switched to prepay service, would you say you think about budgeting for electricity costs more often? About the same? Or less often?

Three-Out-of-Four Customers Say They Have Changed Usage Behavior



- **78% indicated that they have changed their behavior since switching to prepay service**
- **Responses are consistent across categories**
- **There is a strong indication of the value of timely information around energy usage that is driving both awareness and behavioral changes as it relates to proactively managing energy costs**

Q4. Since you switched to prepay service, do you feel you have changed your behavior around how you use electricity in order to reduce your electricity usage and lower your electricity bill?

Intentional Actions Taken to Conserve Energy – Summary List

Actions Taken to Use Less Electricity Since Switching to Prepay Service

Rank	Action Type	Action	"Yes"
1	Behavior	Made sure the lights are off in unused rooms	97%
2	Behavior	Intentionally made an effort to use less electricity	92%
3	Behavior	Adjusted the thermostat a few degrees to use less electricity *when the residence was empty*	84%
4	Behavior	Adjusted the thermostat a few degrees to use less electricity when you or others *are in the residence*	80%
5	Investment	Replaced light bulbs with energy-efficient light bulbs	74%
6	Investment	Applied weather stripping to windows and doors or added insulation to the attic or around the water heater	52%
7	Behavior	Changed the time of day or how often you use your appliances	48%
8	Investment	Made a major investment in the home heating system, in new insulated windows or in new energy-efficient appliances	43%
9	Behavior	Lowered the temperature setting on the water heater to use less electricity	40%
10	Investment	Upgraded or replaced the thermostat	37%
11	Other	Allowed my electricity to be shut off as a way to use less electricity	36%

- **92% said made a conscious effort to reduce electricity, yet previously (Q3) while only 51% indicated they think more often about budgeting for electricity. One potential answer may be that people may make an effort to reduce waste, but not spend time thinking about budgeting**
- **Top 4 are purely behavior with no cash outlay; another behavioral change (water heater temperature setting) is being missed by many consumers, suggesting that the information and effort are not without cost**
- **Even with moderate incomes, a fairly high percentage of customer made expenditures to invest in energy efficiency**

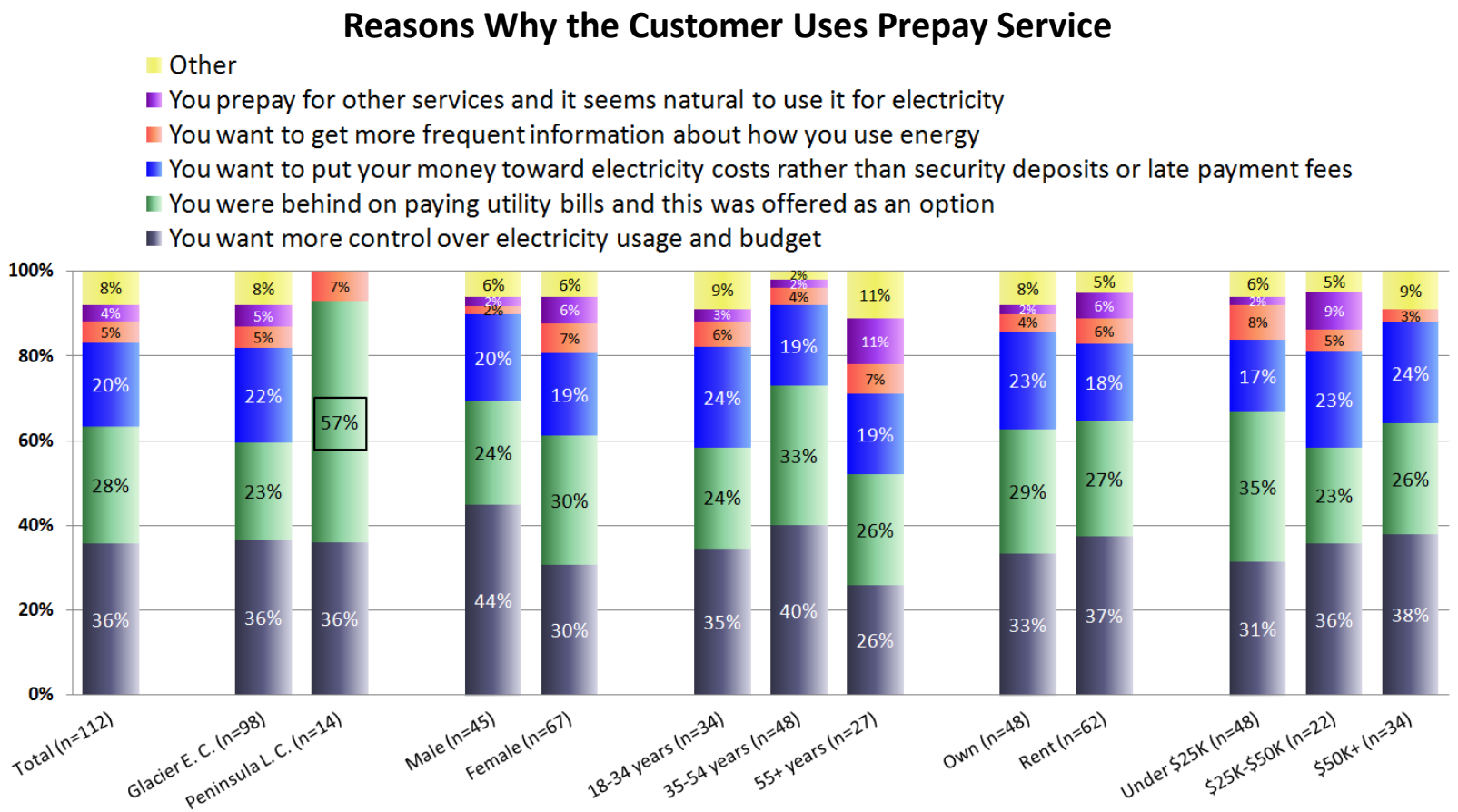
Q5. Please indicate whether you have taken this action since switching to prepay service: (summary list of items A through K)

Disconnection appears to be a choice utilized by customers



- Customers across all demographic categories allow their electricity to be shut off to manage electric costs
  - In response to the question above, 36% of customers indicated they allowed for their electricity to be shut off as a way to use less. The responses included customers across all demographic categories.
  - Nearly one half (48%) of customers in the lower income category ($0-$25K) claim to use this strategy, as compared to one quarter of customers in the $25K-$50K income range, or those with $50K or more in income (22%).
  - This strategy also appears more prevalent for renters (39%) versus (33%) for homeowners in the survey.
  - Additional information is required in this area to better understand the time of year the disconnects are occurring (summer vs. winter) and the rationale behind taking this action versus trying to manage usage more closely through other actions. The response rate does potentially indicate the perceived ease/low cost of the disconnect/reconnect process under prepay vs. post-pay, increasing the value of this action to customers.

Customers Switch to Prepay Service for Control, Budgeting and Cash Allocation

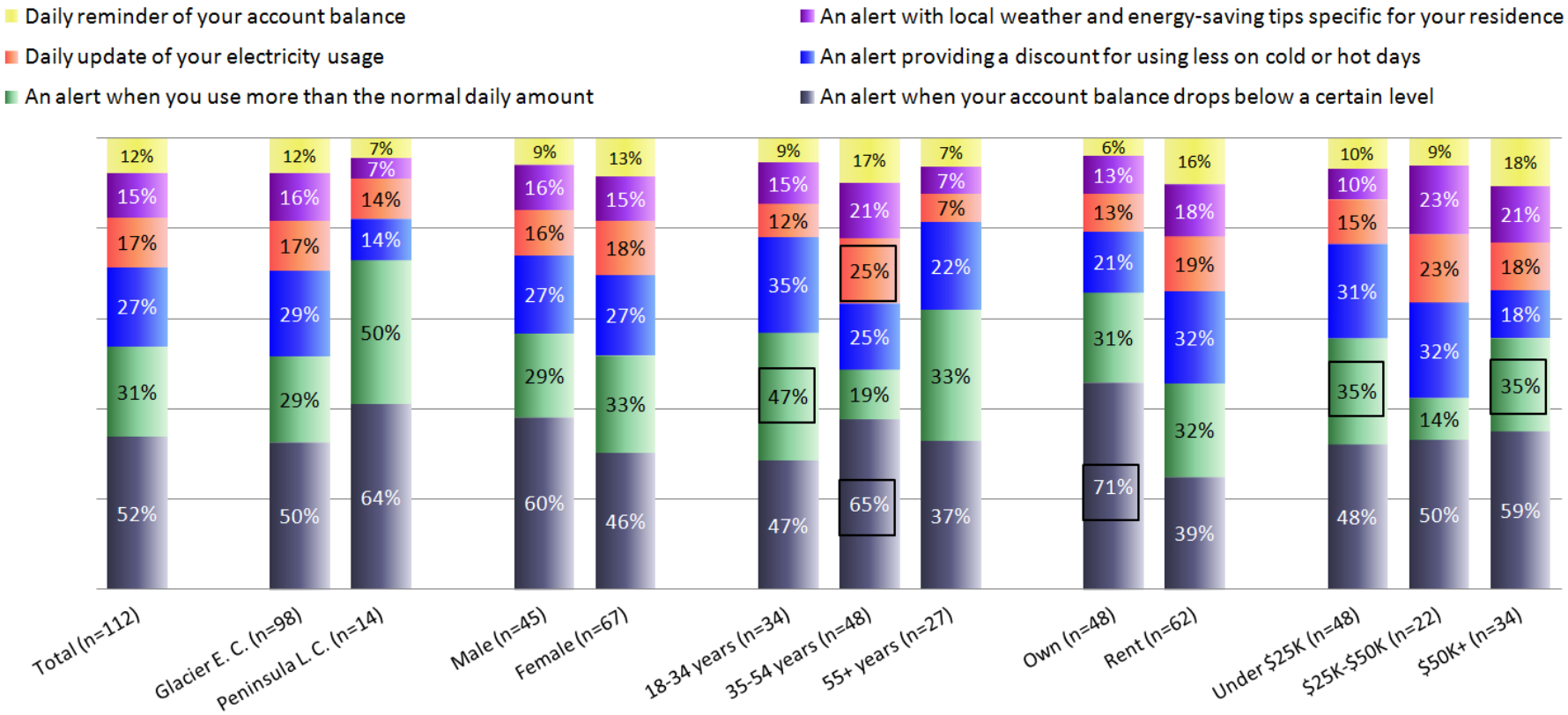


- **Convenience and control are a driver for customers**
- **Prepay service provides an option for customers who are payment- and credit-challenged; prepay is a useful tool for them to make payments and use their available income more efficiently**

Q7. Please indicate why you and your family use prepay electricity service. I will read five possible reasons, please choose the ONE that best fits why you use prepay service.

Preferences Vary and Prepay Service Needs to Offer Information Choices

Most Important Types of Information You Could Receive (Pick Two)



- **Survey responses indicate that prepay service customers want actionable alerts and information rather than just a daily usage or daily account balance reminder. The personalization of information to each customer and residence is important. Customers are saying "tell me when to add to my account," "tell me when my usage is unusual," "tell me if there is an action that will give a discount."**

Q9. When you think about the different types of information you could receive with your prepay service, of the following what are the TWO most important items that you would like to receive, whether they are available to you today or not? (Pick two. Total exceeds 100%.)

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