

Insights from PG&E's Marketplace Initiative on Influencing Purchasing Decisions

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ABSTRACT

Plug-in equipment and miscellaneous loads are expected to contribute the vast majority of electricity demand growth in California in the coming decade and have therefore been explicitly targeted by the state's Long Term Energy Efficiency Strategic Plan (CPUC, 2011) and Existing Buildings Energy Efficiency Action Plan (CEC, 2015). Yet there is a disconnect between the market transformation vision and strategies called for to spur customer demand for highly efficient products and the types of plug load and appliance programs that utilities have traditionally invested in under the existing regulatory framework. The current setup offers a clear path to fund codes and standards programs and plug load efficiency programs that offer incentives for efficient products that have incremental costs relative to inefficient products, while steering utilities away from addressing non-financial market barriers. With its Marketplace trial, PG&E has set out to demonstrate that there is no reason why energy efficient choices cannot be simple, clear and compelling – and to investigate the premise that inserting energy information into the shopping journey can influence a customer's purchase decision, in absence of a traditional rebate. The results of this trial underscore the importance of eliminating fundamental market barriers that stifle private investment, in order to achieve California's aggressive plug load efficiency goals.

The Plug Load Problem

Plug-in equipment and miscellaneous loads are responsible for two-thirds of California's residential electricity consumption today, and are expected to contribute 70% of electricity demand growth from 2015 to 2024 (NRDC, 2015). Plug loads are therefore explicitly targeted by California's Long Term Energy Efficiency Strategic Plan (2011 update) and Existing Buildings Energy Efficiency Action Plan (2015), with a view to slowing and reducing plug load energy consumption. Plug loads are also increasingly important for achieving the whole home retrofit and zero net energy (ZNE) new construction goals included in the Strategic Plan (all new residential being ZNE by 2020 and all new commercial being ZNE by 2030), as hard-wired building technologies and building systems themselves use less energy.

California Investor Owned Utilities (IOUs) are developing new programs to close the gaps between 2020 strategic plan goals and program progress, in line with strategies laid out by the Strategic Plan to accelerate technological innovation through market transformation and efforts to spur customer demand for highly efficient products. Fundamental to any functioning market is transparency, and the invisibility of energy attributes prevents consumers from being able to factor in the relative efficiency of products when making purchase decisions, and – by failing to provide a dynamic benchmark of best commercially available technology – weakens

the business case for manufacturers to adopt more aggressive innovation strategies. Plug load energy efficiency spending has focused almost entirely on some form of financial incentives to encourage early replacement and address the incremental cost barrier, particularly for efficient lighting, so new approaches are needed to tackle non-financial barriers. This is particularly important with respect to fast-growing electronics and miscellaneous plug loads, many of which have rapid replacement cycles and are not associated with prohibitive incremental measure cost¹.

With its Marketplace trial, launched in March 2015, PG&E has set out to demonstrate that there is no reason why energy efficient choices cannot be simple, clear and compelling – and to investigate the premise that inserting energy information into the shopping journey can influence a customer’s purchase decision, in absence of a traditional rebate. Below we provide an overview of Marketplace features, present initial findings from the Marketplace trial and highlight policy issues that will need to be addressed to allow utilities to effectively overcome non-financial barriers to plug-load and appliance energy efficiency such as lack of awareness and concern, and the inability to compare efficiency across products.

PG&E Marketplace Features and Logic

Marketplace is the customer-facing presentation of real-time consumer product market intelligence and analytics, which is complemented by integrated digital rebate processing for eligible product models and digital marketing. The logic model in Figure 1 summarizes the main activities, outputs and impact pathways enabled by the Marketplace.

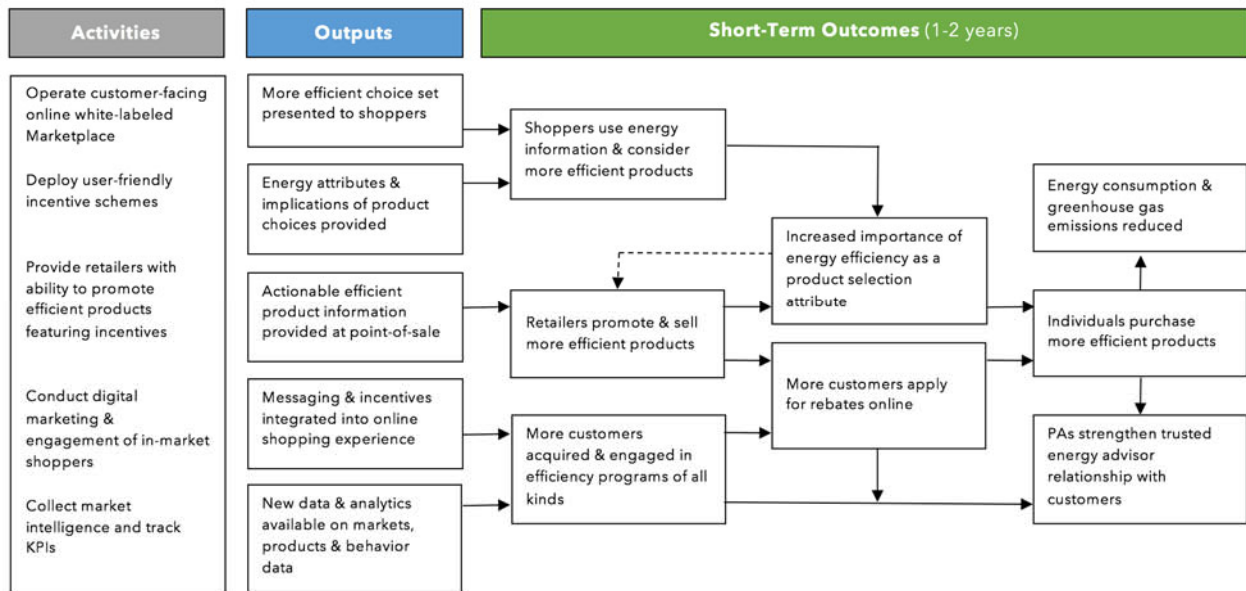


Figure 1. PG&E Marketplace logic model – short-term outcomes for customers

¹ The California Energy Commission, for example, estimated the incremental cost of the proposed new Title 20 standards for laptops at \$1, against lifetime benefits of \$2.30 (CEC, 2016).

When utility customers & in-market shoppers visit the product efficiency Marketplace, they find it easier and more compelling to use energy information and consider more efficient products in their purchase decision-making, resulting in Marketplace visitors ultimately purchasing more efficient products. If the short-term outcomes for consumers presented in Figure 1 are achieved by PG&E and other utilities deploying Marketplace nationwide, broader market transformation outcomes on residential sector trade allies, including retailers and manufacturers, can be realized.

PG&E’s Marketplace (marketplace.pge.com) is the core customer-facing element of the project. It provides utility customers with the ability to research, compare and rank individual product models on features, price, popularity, and – crucially – energy efficiency (Figure 2).

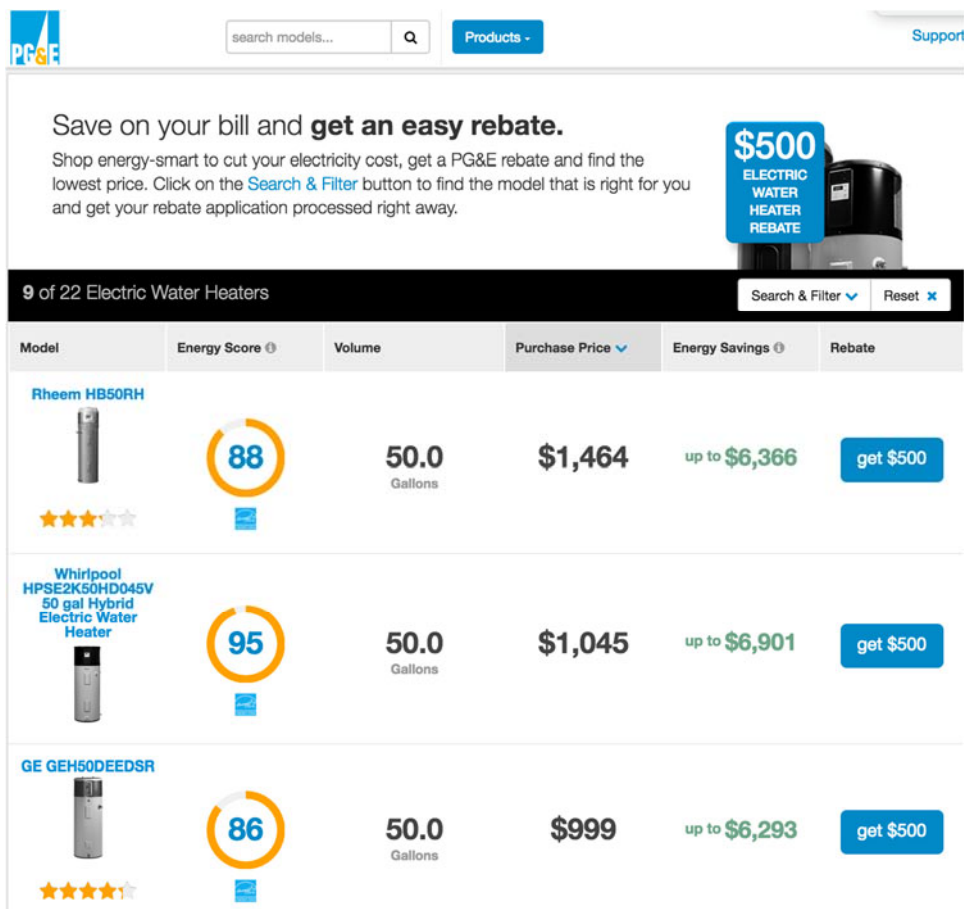


Figure 2. Screen shot of PG&E Marketplace electric water heater category page

The Marketplace is powered by a data engine, which collects, cleans and analyzes over 1,000,000 product offers and 100,000 energy consumption profiles and certifications daily. With respect to energy attributes, Marketplace features an intuitively simple to use, daily-updated relative efficiency score (Figure 2, second column), which assigns each individual product model a score of 1-100, allowing shoppers to instantly understand and compare individual models. Marketplace visitors can also view, personalize and compare the energy bill savings they might realize from an efficient product purchase (Figure 3), supporting total cost of ownership thinking.

Samsung WF56H9100A Washer

234 user reviews. It's in the Top10 best selling products.
★★★★★

The Samsung WF56H9100A is a 5.6 cubic feet front load clothes washer with a water factor of 2.7 (lower is better). Today's lowest price is \$1,300.

100 The Samsung WF56H9100A has very low energy use and is rated as **ideal**.

\$145 SAVINGS Your estimated lifetime **electrical energy savings** vs. a basic new washer.

UP TO \$150 REBATE This model is eligible for an energy efficiency **rebate**. Customers of PG&E and participating water agencies only.

Rebates | Energy Savings | Energy Score | Features | Popularity / Reviews | EcoView | Where to buy | Similar Products

Figure 3. Screen shot PG&E Marketplace clothes washer product page

The Marketplace features both rebated (clothes washers, gas & electric water heaters, pool pumps, LEDs) and non-rebated products (refrigerators, freezers, electric clothes dryers, televisions, sound bars). A seamlessly integrated, digital incentive delivery, verification and reporting system makes it easier for customers to participate in plug load rebate programs. Digital marketing efforts have proven to reach in-market shoppers not yet engaged in utility programs, increasing program reach, and supporting ongoing engagement. The data and insights gained throughout the customer shopping journey allow us to track and “close the loop” between the actions shoppers take and the Marketplace offering and marketing inputs, to better understand the effectiveness of different designs and tactics. The ability to optimize on short timescales is a major advance compared with traditional process evaluation approaches (Rogers et al., 2015).

Barriers to Resource-Smart Purchase Decisions

Consumer choice models for new product purchases can vary between attitude-based choice and attribute-based choice models (Bagozzi, 1992; Fazio, 1990). Attitude-based choice describes when a consumer has a pre-formed attitude toward a particular brand and model. Conversely, attribute-based choice involves the consumer analyzing a variety of attributes perceived as relevant for the product in question (e.g. price, functionality, availability).

PG&E’s customer research shows that 4 out of every 5 customers research appliances online before making a purchase in-store or on-line, and that decisions can take as long as 8 months to be made (PG&E, 2012). It is recognized that consumers may unconsciously switch between choice models within a decision cycle, and there are very likely category effects when it comes to appliance and product purchases, involving different choice models for different categories (e.g. TVs vs. fridges). That said, long decision cycles, low purchase frequencies and relatively high ticket prices for appliances would support the argument that consumers engage in an attribute-based choice model for such products, with energy efficiency and operating cost (i.e.

impact on energy bill) being two such attributes. The situation is clearly different when an appliance stops working and must be replaced as a matter of urgency.

As part of the Marketplace trial, PG&E commissioned case study research to characterize the drivers behind respondents’ purchasing decision-making, the elements of their information search and the sources they trust and the criteria they utilize to evaluate alternatives and the reasons they decide on the specific product they ultimately purchase. The case studies targeted three individuals for each of five product categories, including two rebated product categories (clothes washers, gas water heaters) and three non-rebated categories (TVs, refrigerators, electric dryers). Participants were selected by a panel company to ensure representativeness; a subsequent pre-screening process identified people who were in the market to purchase one of these appliance types. The research involved in-depth telephone interviews and a web-based diary study, spanning the complete journey of in-market shoppers from initial research to purchase. Given the small sample sizes, the results are most useful in providing context for interpreting Marketplace online user behavior.

Overall, product reviews were regarded to be among the most important decision attributes (Table 1), except in the case of refrigerators, where price and brand dominate. Energy efficiency and potential energy bill savings were also considered to be important, but with wide variations across product groups. These energy attributes were among the top two or three most important when shopping for TVs, gas water heaters and clothes washers.

Table 1. Mean importance of decision attributes for choosing appliances

Purchase Decision Attribute	Mean Importance (1–10 scale, 10=most important)	Rank Order Importance (1= most important)
Product reviews	9.2	1
Energy efficiency	8.5	2
Specific features (sizing, shape, etc.)	8.0	3
Impact on energy bill	7.8	4
Rebates	7.6	5
Price	7.5	6
Brand	7.4	7
Product availability in local retail stores	7.2	8
Design/visual appearance	6.9	9

Moreover, energy related information is considered by case study participants to be difficult to find when shopping for appliances (Table 2), with information on rebates, energy bill implications of product choices and energy efficiency rated lowest on “ease of finding information.” It appears that even when shoppers wish to factor energy attributes into their shopping journey (Table 1), they have a hard time finding the information they need to act on their desire to shop energy smart.

PG&E’s Marketplace initiative began with the goal of capturing – and serving as a trusted energy advisor to – in-market appliance consumers at various stages of their purchase journey and decision cycle. More specifically, its goal was to provide consumers with a better experience in terms of information on relevant products and to increase the ease of finding rebated products. Moreover, while rebates are seen as a highly influential decision criterion for consumers (Table 1), they are not available for the vast majority of product categories, and the California’s Energy Efficiency Strategic plan has articulated a future roadmap that phases out rebates in favor of market transformation and product standards and building codes.

Table 2. Mean ease of finding information on decision attributes

Purchase Decision Attribute	Mean Ease of Finding Information (1–10 scale, 10=easiest)	Rank Order Ease of Finding Information (1=easiest)
Price	9.6	1
Brand	9.1	2
Design/visual appearance	8.4	3
Specific features (sizing, shape, etc.)	8.0	4
Product availability in local retail stores	7.8	5
Product reviews	7.7	6
Energy efficiency	7.4	7
Impact on energy bill	5.8	8
Rebates	5.3	9

These findings present an opportunity for PG&E to increase the visibility and accessibility of energy related information and thereby increase the potential for the information to influence customer purchasing decisions. PG&E partnered with Enervee to launch the PG&E Marketplace to insert energy information (as both energy efficiency and operating costs) into the shopping journey and to examine the opportunities this new approach may present.

Promising Early Results from Marketplace Deployment

A wide range of information is available to document consumer benefits and program outcomes. Digital tracking data on how Marketplace visitors behave while they are interacting with the website, as well as on marketing and rebate activity is one source of objective information. Key Performance Indicators (KPIs) established for this purpose rely on a variety of data sources, such as Google Analytics, program opt-in data and transaction information. In addition, PG&E’s case study research provides information on how customer awareness, knowledge and attitudes may have changed as a result of the Marketplace experience. Below we review a selection of results that highlight several important short-term outcomes, with reference to the logic model presented above.

In-Market Shoppers are Aware of and Influenced by Energy Information

The Marketplace has demonstrated its ability to make product efficiency visible, which can increase awareness, interest (consideration), desire (preference) and, ultimately, the act of making a more efficient purchase.

- **Shoppers consider more energy efficient products than they otherwise would have.** One indication is that product models viewed on the Marketplace tend to be more efficient than models sold online nationally. We estimate that the market-weighted average energy consumption of the clothes washer models that shoppers viewed on the Marketplace in December 2015 and January 2016, for example, was 5% to 10% lower than clothes washers sold nationally, and they are also larger and 30% more water efficient. This suggests that Marketplace effectively influences the choice set

perceived by Marketplace visitors, without artificially restricting product coverage. Further research is required to determine why this is the case, but two interesting research areas are immediately identified. Firstly, ordering effects in terms of the default ordering of products on Marketplace may influence consideration and preference (Day et al., 2012). These ordering effects may be strengthened due to Marketplace sorting search results based on a weighted formula of attributes, with rebates (when offered) and Enervee Score the most heavily weighted attributes. As such, Marketplace makes energy efficiency and rebates accessible and more fluent (Oppenheimer, 2008) for consumers. Second, the fact that Marketplace arguably frames (Tversky & Kahneman, 1981) the entire purchasing experience as being one around energy efficiency may create a ‘pre-commitment’ effect (Meyvis, Bennett & Oppenheimer, 2010), whereby visitors to Marketplace ‘commit’ to the notion of buying energy efficiency by virtue of visiting the site and then further weight this attribute so as to avoid any sense of inconsistency or cognitive dissonance (Festinger, 1957) in their purchasing behavior. Whereas some regulators might view shoppers who visit Marketplace as free riders, the behavioral science literature suggests that active framing can play a role in both attracting visitors to Marketplace in the first place, as well as in strengthening their commitment to follow through with an energy-efficient purchase.

- Marketplace visitors use energy information on Marketplace.** A product category page, such as that shown in Figure 2, offers a number of ways for visitors to sort the product data. In Figure 4, we have summarized the relative share of sorts performed by visitors to PG&E’s Marketplace for April 2016. With the exception of the washer category, price is not among the attributes used to sort products most frequently; rather the Energy “Enervee” Score is commonly used (ranking in the top 3 across all categories in terms of number of sorts). Across all categories, 7% of Marketplace users sorted by Enervee Score, more than for any other product attribute, although further study will be needed to rule out any horizontal ordering effect, given that the Score is the first sortable column.

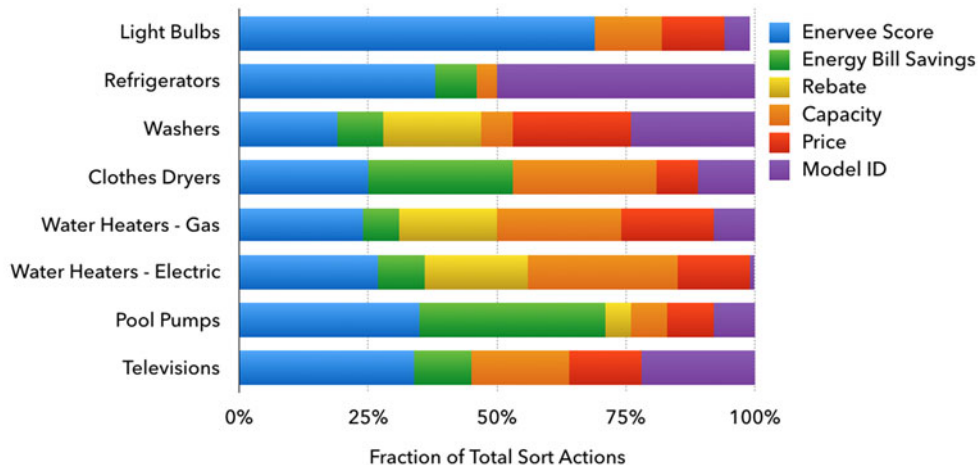


Figure 4. Use of sort function by product category on PG&E Marketplace.

- **Marketplace influences purchase decisions.** Case study participants generally felt that Marketplace had a measurable influence on their purchase decision (rating of 7.2 on a 1-10 scale, where 1 = “not at all influential” and 10 = “very influential”). One likely reason is that the Marketplace provides rebate, efficiency (Enervee Score) and operating cost information (personalized energy bill savings estimates) that shoppers wish to consider when choosing products (Table 1), but which is otherwise difficult to find (Table 2), reducing search costs.
- **More customers can be acquired and engaged in utility programs of all kinds.** PG&E drives engagement with PLA programs by sending seasonally relevant messages to digitally engaged customers via its existing communication channels (email newsletters, electronic home energy reports, social promotion) and to in-market shoppers who are not engaged customers via digital marketing (paid search, paid social and retargeting). Not only does this make participating in an incentive program easier but it has the added benefit of increasing the number of customers that have an active online relationship with PG&E.

Customers Purchase More Efficient Products

The Marketplace environment includes a resource acquisition component, in the form of downstream rebates. Enervee has helped PG&E modernize the rebate application, verification and payment system, by creating a seamless, digital process. Customers opt-in to the rebate program for a specific product model, and the Marketplace informs shoppers in real time which models qualify for a rebate. In addition, utility customers receive information on both energy and potential water rebates, so they can consider the larger combined rebate (up to \$150 combined, rather than only \$50 from PG&E) while shopping. There are no paper forms to complete (proof of purchase can be provided by email), and payments usually occur within a week of verification. In-market shoppers who might not be aware of available rebates or the Marketplace can be reached via retailers who have integrated the Enervee Charge module into their e-commerce sites. This notifies shoppers of available rebates for specific product models and allows them to apply for a rebate while they are on the retailer website.

This digital rebate program makes it straightforward to track efficient product purchases, reducing rebate application rejection rates, improving customer satisfaction, and perhaps making rebate programs more cost-effective. Preliminary results suggest that more customers apply successfully for rebates online. The total number of rebate applications submitted via the Marketplace alone increased 10-fold, from 155 applications during March 2015, the first month of operation, to over 1,500 per month in November and December 2015. Applications submitted online via Marketplace have reached as high as 17% of all rebate applications. In 2015, 4.3% of rebate applications were rejected for a variety of reasons, compared to 18.9% for applications submitted via other channels (paper or web portal). The number of rebate applications rejected in the first 4 months of 2016, because the purchased model does not meet the qualification requirements was 0.8%, versus 8% through other rebate application channels.

Outside of the rebated products for which proof of purchase is available, and absent customer data, it is challenging to track actual product purchases influenced by marketplace visitors to quantify energy savings.

Customers Rely on their Utility as a Trusted Energy Advisor

High levels of customer satisfaction and the ability to cultivate, promote and sustain lasting energy-efficient behaviors by residential customers are critical to utility success in achieving the State's ambitious energy efficiency goals. A shift from reactive or proactive to truly interactive approaches is needed to engage customers and build stronger relationships. PG&E therefore evaluated case study participants' satisfaction with the Marketplace offering and how customer interaction with Marketplace may have affected their attitudes towards PG&E.

- **Satisfaction with the Marketplace user experience.** Users were generally pleased with the Marketplace, providing high ratings for overall satisfaction with the website (rating of 7.7 on a 1-10 scale, where 1 = "extremely dissatisfied" and 10 = "extremely satisfied"). And they reported that their overall shopping experience was easier as a result of using Marketplace (rating of 7.2 on a 1-10 scale, where 1 = "not at all easier" and 10 = "much easier").
- **Impact of Marketplace on attitudes towards PG&E.** Case study research results suggest that Marketplace may have a positive influence on users' views of PG&E. Three out of four Marketplace users indicated that using Marketplace had given them a "more favorable" opinion of PG&E, while the rest indicated their opinion of PG&E was "about the same." Additionally, moving from the pre-Marketplace interviews to the post-purchase interviews, there was a small but positive increase (+0.33 on average) in users' agreement with key statements regarding PG&E ("company you can trust", "easy to do business with", "trusted source of information regarding energy efficiency").

Integrating Marketplace into the Energy Efficiency Portfolio

Integration Across Residential Programs

Marketplace can be deployed for multiple purposes, in parallel or separately, for example, to provide:

- Core utility services: allows PG&E to provide a high level of customer service and maintain an ongoing relationship with residential customers, to track progress towards market transformation and to benchmark and make product efficiency visible
- Energy efficiency (resource acquisition) program: achieve kWh, MW and therm savings with customer- and retailer-targeted approaches
- Market transformation: eliminate fundamental market barriers, in particular, lack of actionable efficiency information throughout shopping journey
- Codes & standards: establish a dynamic reach standard for super-efficient products
- Behavior change: focus on shopping behavior, 1-time purchasing decisions
- Marketing, Education and Outreach (ME&O) program: raise awareness, educate and increase participation in various PG&E programs.
- Low-Income programs: Support in-home education, digital marketing & outreach, energy efficiency program delivery.

PG&E's Marketplace approach operationalizes each of these strategies. Going forward, Marketplace will continue to deliver downstream plug load and appliance (PLA) rebates for

selected product categories and will complement PG&E’s midstream activities, such as the Retail Products Platform (RPP) Pilot². Marketplace also offers an opportunity to act upon the multitude of tips and recommendations by PG&E to purchase energy efficient products, providing a more direct path to energy efficient behaviors.

This broad, data driven approach also has the potential to touch participants other than utility customers, including retailers, manufacturers, program administrators, and officials responsible for policy and regulation. Examples of broader market transformation functions include providing a dynamic benchmark for best commercially available technology to stimulate continual innovation, establishing a historical consumer product efficiency database, enabling retailers to promote efficient products in-store and online, and enabling policymakers to analyze consumer product market efficiency trends and ensure compliance with product standards.

Policy Considerations

PG&E is now looking at the best opportunity to anchor the Marketplace offering within the residential energy efficiency portfolio. California’s Long Term Energy Efficiency Strategic plan calls for utilities to develop comprehensive, innovative initiatives to reverse the growth of plug load energy consumption through technological and behavioral solutions that drive continual improvement build consumer awareness and demand and transform markets. The results presented above for PG&E’s Marketplace trial suggest that this is feasible with a focus on the consumer, and taking a data-driven and comprehensive approach. However, we have identified a number of issues that arise when considering full integration of Marketplace into IOU energy efficiency portfolios under the current policy and regulatory framework.

- **Cost-effectiveness.** Energy Efficiency Portfolios must meet cost-effectiveness thresholds, yet achievement of the Commission’s short- and long-term energy savings goals and Strategic Plan objectives related to plug loads suggests increasing emphasis on non-resource and integrated programs. Investments into non-resource programs for which the IOUs cannot claim energy savings, such as emerging technologies or information and education programs continue to be treated as costs, without recognizing their benefits, which reduces portfolio cost-effectiveness when applying current cost-effectiveness tests.
- **Evaluation.** Marketplace is a digital offering that can be deployed as a stand-alone rebate program, where standard EM&V procedures would apply. But its main function in the context of the Strategic Plan is to empower customers to routinely shop resource-smart to reduce plug load by eliminating persistent and pervasive market barriers. The Marketplace trial included both rebated and non-rebated categories, and it is difficult to evaluate and capture the full value of Marketplace under existing frameworks.
- **Program cost caps.** Program cost caps for specific program cost elements require IOUs to minimize their non-incentive budgets, like ME&O and Direct Implementation³ Non-Incentive (DINI) costs, including customer support and direct-implementation specific IT

² The RPP is a nationwide market transformation program piloted by PG&E that aims to encourage participating retailers to stock, promote and sell more efficient appliances. Marketplace will identify product models that qualify for incentives under RPP using the “Smart Choice” designation to support the program.

³ Direct implementation costs are defined as “costs associated with activities that are a direct interface with the customer or program participant or recipient (e.g., contractor receiving training).” Direct implementation includes two subcategories: (a) rebate and incentive costs and (b) DINI.

costs. As greater emphasis is placed on eliminating fundamental market barriers other than cost, the original rationale behind the ME&O and DINI cost caps may no longer be valid.

Allowing utilities to generate a return on investment into information and communication technology infrastructure, including SaaS (software-as-a-service) – which is not tied to any one program, and is essential to support long-term market transformation and empower customers to manage their energy consumption – could overcome certain policy barriers. The April 2016 ruling by California Public Utilities' Commissioner Florio – proposing to establish, on a pilot basis, an interim program offering regulatory incentives to the three large IOUs for the deployment of cost-effective DERs (CPUC, 2016) – offers one framework for doing so. A vibrant Marketplace would enable IOUs to play a vital role engaging end-use customers in the DER market, as is being tested in New York under various REV demonstration projects.

More fundamentally, a greater emphasis on eliminating non-financial barriers will be needed. Much of the growth in California's electricity demand is expected to come from electronics and miscellaneous plug loads, where the energy saving potential per unit is small and the main barriers are non-financial. Resource acquisition through downstream rebates is therefore neither a viable nor a sensible strategy for this target product group. Marketplace, and other PG&E programs like the Retail Products Platform, is working to address market barriers to purchasing energy efficient appliances other than cost.

Conclusions

PG&E's Marketplace trial has demonstrated that utilities can spur customer demand for highly efficient products through a cloud-based software application that analyzes product markets in real time and provides utility customers with the ability to research compare and rank individual product models on features, price, popularity, and – crucially – energy efficiency. Marketplace makes efficiency visible and accessible to in-market shoppers throughout their shopping journey, increasing the likelihood of influencing purchasing decisions. Whether deployed as a resource acquisition program that provides rebates, a non-resource program or a combination (featuring both rebated and unrebated products), there is a wealth of digital online behavior and program information available to track outcomes that benefit ratepayers and help utilities implement the innovative plug load strategies envisioned by the CPUC and CEC.

Additional value is derived from the cross-cutting market transformation functions performed by the Marketplace package, such as providing a dynamic benchmark for best commercially available technology to stimulate continual innovation, establishing a historical consumer product efficiency database, enabling retailers to promote efficient products in-store and online, and enabling policymakers to analyze consumer product market efficiency trends and ensure compliance with product standards.

The Marketplace trial provides a growing body of evidence that it will be feasible to speed the efficiency improvement in fast-growing plug load and appliance categories, which is essential to achieve California's overall energy efficiency goal of doubling the rate of efficiency improvement by 2030, adopted under Senate Bill 350, the Clean Energy and Pollution Reduction Act of 2015. Yet there is a disconnect between the market transformation vision and strategies called for to spur customer demand for highly efficient products and the types of plug load and appliance programs that utilities have traditionally invested in under the existing regulatory

framework. Current regulatory proceedings present an opportunity to overcome policy barriers that discourage utilities from addressing non-financial market barriers that prevent consumers from making resource-smart purchasing decisions.

With its Marketplace trial, PG&E has set out to demonstrate that there is no reason why energy efficient choices cannot be simple, clear and compelling – and to investigate the premise that inserting energy information into the shopping journey can influence a customer’s purchase decision, in absence of a traditional rebate. The results of this trial are promising, and suggest that Marketplace enables utilities to correct longstanding market failures, reduce search costs and strengthen their trusted energy advisor role, which can go a long way towards unleashing the power of the pocketbook to drive consumer product efficiency. With that foundation, incentives can be better targeted to address other barriers, including financial barriers, such as the up-front cost of early replacement of appliances by lower income households or incremental costs associated with some cutting edge technologies. Beyond efficiency, such consumer-facing marketplaces are poised to play a vital role in engaging end-use customers in the DER (distributed energy resources) market more broadly.

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