Engaging Customers to Adopt Distributed Energy Resources

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ABSTRACT

Increasing penetration of distributed energy resources (DER), new technologies, and aging infrastructure are all driving the need for reconsideration of the utility business model and the ways in which energy is generated, transmitted, and distributed. New York is leading the way in addressing these challenges through its Reforming the Energy Vision (REV) initiative. Through demonstration projects, REV will show how utilities can promote EE and speed the adoption of renewable energy, demand response, and new technologies, all while exploring new sources of revenue and empowering consumers with more choice and control. This paper describes the design and metrics for one such project that helps drive adoption of DERs through sophisticated analytics and a multi-channel engagement platform. This Consolidated Edison (Con Edison) and Opower partnership will show how utilities can match customers in the Brooklyn and Westchester areas with products and services that meet their needs. These products and services include rooftop solar installations, home energy audits and retrofits, smart thermostats, and energy efficient lighting and appliances sold in a digital Marketplace. Using Opower's technology platform, Con Edison will deliver personalized outbound communications, including paper and email home energy reports, as well as high bill alert notifications that feature energy insights and tailored recommendations for products and services. Con Edison will generate revenue through advertising, retail sales, and lead and conversion fees. This project and the underlying customer engagement technology behind it will pave the way for utilities to provide personalized information and offers to the right customers at the right time, which will be a critical piece of the new energy future.

Reforming the Energy Vision

In April 2014, the New York Public Service Commission (PSC) initiated the Reforming the Energy Vision (REV) proceeding as part of a broader state-wide initiative aimed at achieving deeper penetration of renewable and distributed energy sources, such as energy efficiency, demand response, rooftop solar, micro-grids, energy storage, combined heat and power. The PSC vision for REV is to build a more efficient and resilient energy grid in which consumers will have more control over their energy use and be engaged as energy producers.

The six primary objectives outlined by the PSC in the REV proceeding are:

- Enhanced customer knowledge and tools that will support effective management of the total energy bill
- Market animation and leverage of customer contributions
- System wide efficiency
- Fuel and resource diversity
- System reliability and resiliency
- Reduction of carbon emissions

REV Demonstration Projects

An important part of realizing the PSC's new energy vision for the New York electricity sector is to test and learn through a series of demonstration projects (NY PSC M-14-0101 December 12, 2014). The intent of the early REV projects is to advance the development of new utility and third party service or business models and to gain experience with adoption and integration of distributed energy resources.

The REV demonstration projects will evaluate the performance of various clean, distributed energy technologies, their behavior and contributions to the grid, the roles and interactions of the utility and the third party technology providers. The projects are also a way to gauge customer receptivity toward REV-like technologies and services. The learning from the demonstration projects will inform many future aspects of REV policy, including the utility role in operating a distribution system platform, business models that appropriately value DER investment, and what role can be expected of consumers in this new energy future.

Connected Homes Demonstration Project

Con Edison and Opower have teamed up to deliver the Connected Homes Platform demonstration project (demonstration project) beginning in May 2016 and running through July 2018. The project is aimed at addressing two barriers to the REV goal of increasing customer adoption of DERs. The first barrier is a lack of understanding by residential customers of which DER products and services will help them effectively manage their energy usage, energy costs, and comfort in their homes. The second barrier is the high customer acquisition cost for many DER providers, especially rooftop solar, which impedes the growth of DER markets. While other market barriers may exist, Con Edison will address those through their portfolio of energy efficiency programs. This demonstration project is focused on addressing a few barriers not previously addressed in other ways or through other programs.

Drawing on a similar model in other industries, where the value of a sale is determined and a market of likely buyers in defined, and Opower's experience driving program participation lift, Opower and Con Edison hypothesized that the utility is likely to be a successful channel for promoting DERs.

To address the first barrier, the demonstration project will evaluate the effectiveness of various personalized paper and digital communications that include offers of DER products including rooftop solar and home energy services including energy audits and retrofits. What makes these offers unique as compared to traditional DER marketing offers is 1) they are being communicated within a personalized communication that is branded Con Edison – the trusted local utility, and 2) they are contextually relevant by being embedded within a broader set of information that is educating customers on their own household energy consumption.

Independent evaluations have consistently demonstrated the ability of Opower Home Energy Reports (HER) programs to drive participation lift in energy efficiency and other utility programs on average by 11 percent. This analysis is based on program lift documented in multiple independent evaluations, covering 44 participant waves at 12 utilities, several of which are included in the References section at the end of this paper (Gunn 2012; KEMA 2013, NMR 2013, Opinion Dynamics 2013, Cadmus 2014, Navigant 2014, DNV GL 2014). The participation lift effect can be further increased through the targeted promotion of portfolio programs through the HER, with expected median participation lift increases of 30 percent based on past program performance. Based on these results, third party DER providers will benefit from direct access to Con Edison customers via a utility endorsed and branded platform, a targeted channel and targeting based on energy data analytics. The Connected Homes Platform should improve results over the current customer acquisition approach used by many DER providers. Con Edison's ability to analyze customer usage and bills to accurately target the right offer to the right customer should generate higher conversion rates for DER providers, including energy efficiency, by placing promotions in the context of personalized energy insights.

To address the second barrier, the demonstration project will evaluate third party DER providers' willingness to pay Con Edison for qualified new customer leads and conversions, and whether this can generate a sustainable revenue stream for Con Edison by allowing it to monetize utility and customer data without exposing it to third parties due to privacy reasons. Con Edison estimates that the demonstration project could generate up to \$1.6M in revenue from third party partners and online Marketplace during the two year demonstration period. Revenues earned by Con Edison will be applied toward revenue requirement, therefore having a direct benefit to customers by helping to reduce overall rate impacts. Payments for lead generation and conversions are defined in bilateral agreements between Con Edison and the third party DER providers participating in the demonstration and offering rooftop solar and home services including audits and efficiency retrofit services.

The demonstration project will test four main hypotheses:

- 1. A Con Edison sponsored platform that matches specific DER solutions to eligible customers will drive greater DER adoption
- 2. Presenting third-party DER offers in the context of energy usage insights can drive greater DER adoption
- 3. Con Edison will be able to generate revenue from third-party DER providers through a combination of strategies including lead generation.
- 4. The Connected Homes Platform will provide customers with a positive customer experience and improve customers' access to their energy data.¹

Communications Channels for Connected Homes Demonstration Project

The demonstration project will deploy a comprehensive customer engagement effort through outbound communications and a web-based channel. The channels provide an opportunity to reach customers during different times when they are thinking about their energy.

Outbound Communication Channels

Outbound communications are important because they can reach customers at a large scale, particularly those who might not otherwise proactively seek information. By including personalized energy usage information and insights within each communication, the demonstration program can capture customers' attention and driver higher rates of action. The benefit for customers is the expected translation into bill savings from adopting more efficient behavior and higher levels of satisfaction navigating the DER market.

¹ All Con Edison customers have access to their energy data via Green Button but only participants in the demonstration project will have access to the full Connected Homes platform.

Direct-mailed HER will deliver easy-to-understand, personalized, and actionable energy data, insights, and recommendations designed to capture the attention of customers. Opower's Customer Engagement Tracker, an ongoing survey conducted with a variety of utilities and reaching tens of thousands of utilities customers, has consistently shown that more than 8 in 10 recipients read and recall the reports (Puget Sound Energy DNV KEMA 2012, AEP Ohio Navigant 2012, Wickman and Van Atta September 2014). Direct-mailed HER include normative comparison of customer' energy use to that of similar homes, putting energy consumption in context; usage analysis that provides customer-specific insights based on usage, size of home, demographic information; and promotions that can drive customer interest in featured energy products and services.

Email eHER contain energy insights and analysis similar to direct-mailed HER, provide a cost-effective channel to remind customers about their usage behavior, and include direct links to promotions on vendor partner landing pages.

High Bill Alerts are intra-billing cycle notifications for customers who are trending toward a higher than normal bill. These communications raise awareness among customers of their energy usage and provide contextual actions to help them better manage their usage and eventual bill amount. The High Bill Alerts provide an opportunity to market relevant programs and services in a highly segmented fashion, taking advantage of when customers are particularly motivated to explore options for lowering their bills.

Digital Communication Channels

In addition to outbound communications, Con Edison demonstration project target customers will have access to web resources and an online Marketplace (https://marketplace.coned.com/). The web resources are self-service digital tools with personalized energy usage analysis, insights, and calls to action. The online Marketplace will expand customer choice by providing a website with a broad selection of energy-related products paired with customer educational tools such as energy ratings and customer reviews, and linking customers directly to retailers where they can purchase the products. The Marketplace will also include a Storefront which will provide customers with a way to purchase low cost and easy to fulfill products directly from Con Edison, including smart thermostats and LED bulbs for which instant rebates will be available. Where Con Edison offers rebates on other efficient products as part of its broader portfolio of energy efficiency programs, those will be indicated with each product marketed on the Marketplace.

Program Design

The initial phase of the demonstration project will target a limited set of DERs to customers through six different tracks as described in Table 1. Opower's platform improves personalization based on customer interactions over time such as logging into the Con Edison website to view customer energy data, completing an online home energy audit, clicking on links in digital communications, making purchases of efficient products through the Marketplace, or participating in other utility offered programs. Therefore, the customer experience and offers will become more dynamic as the demonstration project progresses and as more DER providers gain interest in participating in the Connected Home demonstration to target customers.

	Targeted		Targeted	
Tracks	Offerings	Characteristics	Homes ²	Notes
1 and 2	Rooftop Solar	Single Family	Track 1:	Households which have
			53,400	registered their emails with
	&	Owner Occupied		Con Edison will receive a
			Track 2:	mixed paper and digital
	Home	High users	43,400	experience (Track 1), while
	Services			homes that have not will
				receive a paper-only
				experience (Track 2)
3 and 4	Smart T-Stat	Single Family	Track 3:	Households who have
			18,100	registered their emails with
	&	Owner Occupied		Con Edison will receive a
			Track 4:	mixed paper and digital
	Home	Moderate Users	20,700	experience (Track 3), while
	Services			homes that have not will
				receive a paper-only
				experience (Track 4)
5 and 6	Smart T-stat	Multifamily	Track 5:	Households which have
		(2-4 Unit)	30,200	registered their emails with
				Con Edison will receive a
		Owner Occupied	Track 6:	mixed paper and digital
			33,300	experience (Track 5) while
		Moderate Usage		homes that have not received
				a paper-only experience
				(Track 6)

Table 1. Program Design for Targeted Offerings

Segmentation

Targeting the right offers to the right customers will rely heavily on smart segmentation. The Opower platform combines a wide variety of attributes from Con Edison and publicly available external data sources including energy, demographic, behavioral, and psychographic into segmentation profiles. The demonstration project will use customer segmentation to pair households to the right DER products and services, using criteria such as energy usage rankings, housing stock type, and home ownership data. As customers take actions such as clicking on links in digital outbound communications or fill in information on the website about their home, the platform will incorporate this into the customer's profile to inform the personalization and offers in future communications.

² Total number of homes targeted during the duration of the pilot from 2016-2018.

Using the results of segmentation, promotions for energy products and services can be carefully targeted and paired with timely advice to create an experience designed to motivate customers to take action and follow-up on featured promotions.

For example, a customer may receive a Home Energy Report in spring showing how their energy use compares to neighbors and providing tips for getting ready for the cooling season, including a targeted promotion for a smart thermostat. A few months later, after a summer month when the customer had higher than average usage, the customer may see a breakdown of how much cooling contributes to usage in their home and include a reminder about the same smart thermostat.

Figure 1 illustrates an example of customer segmentation methodology utilized to best target customers for certain products and services.



Figure 1. Sample customer segmentation tree

Metrics for Success

The primary measurement of success for the demonstration project will be the ability to generate leads for DER products and services and the willingness of DER providers to pay for those leads. Con Edison has identified specific metrics of success that will be measured across four categories: 1) market animation – measuring the effectiveness of targeted, personalized communications to drive adoption of DER products / services, 2) stakeholder sentiment – measuring the impact on key stakeholders and viability to apply the model outside of Con Edison, 3) new revenue – viability of the business model outside of a demonstration pilot, and 4) co-benefits – measuring benefits that materialize from the demonstration project that are not the direct purpose of the project. Randomized control trial (RCT) will be used to measure most of the demonstration project results (see Stewart and Todd 2015). The demonstration project will begin in mid-2016 and initial results will be reported in late 2016.

				Reporting
Category	Goal	Metric	Definition	Cadence
	Awareness and Engagement	Customers aware of DER partners	Response to customer survey questions about awareness of DER offerings in Con Edison's territory	Annually
		Total number of impressions	Total number of paper and digital communications sent to customers, cut by DER	Quarterly
		Open rates (eHERs)	Percent of customers who open eHERs with targeted offerings, cut by DER	Quarterly
		Open rates (HBAs)	Percent of customers who open HBAs with targeted offerings, cut by DER	Quarterly
		Click through rates (eHERs)	Percent of customers who click on the link/s included in eHERs with targeted offerings, cut by DER	Quarterly
Market Animation		Click through rates (HBAs)	Percent of customers who click on the link/s included in HBAs with targeted offerings, cut by DER	Quarterly
		Unique web visits	Number of unique customers who visit the web portal	Quarterly
		Customers who recall HERs	Percent of homes that receive HERs who recall receiving HERs	Annually
	Leads and Acquisition	Qualified solar leads generated	Number of qualified leads from the targeted offerings	Quarterly
		Solar installations reported	Number of installations	Quarterly
		Thermostats sold	Number of thermostats sold through the targeted offerings	Quarterly
		Home Energy Audits completed	Number of home energy audits completed	Quarterly
		Home Energy Efficiency Retrofits	Number of completed energy efficiency projects following a home energy audit	Quarterly
		Recipients and controls	Number of leads and acquisitions among recipient customers and control customers	Quarterly

Table 2. Metrics to be Measured During Connected Home Platform Demonstration Project

	Partners	DER partners retained	Percent of DER partners who choose to continue with the targeted offerings	Annually
Stakeholders	Customers	Positive customer experience	Percent of customers who respond positively to survey questions on their satisfaction with targeted offerings	Annually
Revenue Realization	Total Revenue	Total revenue to Con Edison	Revenue earned through the targeted offerings	Annually
Customer		Energy efficiency savings	Behavioral energy savings generated by customers as a result of participating in the program	Monthly
Co-Benefits	Energy / Demand / Benefits	Demand savings (MW)	Demand savings generated by customers as a result of participating in the program	Monthly
		Indirect energy savings	Total kWh savings from product sales from the Marketplace/Storefront	Quarterly
		Reduction in greenhouse gas emissions	Greenhouse gas emissions reduction from product sales from Marketplace/Storefront	Quarterly
	Sales and Rebates on Marketplace/ Storefront	Number of sales on the Marketplace Storefront	Products sold (total and by product category) via the Marketplace Storefront by month	Quarterly
		Revenue per sale on Marketplace Storefront	Revenue earned by Con Edison by product category for sales in the Marketplace/ Storefront by month	Quarterly
Digital Marketplace		Revenue from reportable sales on third party retail sites	Revenue from products sold on third party retail sites within the retailer referral period to customers referred via Marketplace	Quarterly
	Engagement with Marketplace/ Storefront	Storefront sales by engagement strategy	Number of sales on the Marketplace Storefront by engagement channel (e.g. paid search, social, etc.) and by a set of messaging categories to be determined (e.g. type of promotion) by month	Quarterly
		Time spent on website by engagement channel	Time spent on website by engagement channel (e.g. paid search, social, etc.) by month	Quarterly

HER = *Home Energy Report; eHER* = *Email Home Energy Report; HBA* = *High Bill Alert; DER* = *Distributed Energy Resource*

In addition to the above listed metrics, the demonstration project will provide key data and insights that can help answer the following critical questions which are central to understanding customer willingness to participate in REV.

- 1. How effective can the Connected Homes Platform be as a tool for promoting the adoption of DERs in NY?
- 2. What messages and channels are most effective for engaging customers with information about energy products and services?
- 3. Which energy products and services are best suited for which groups of customers?
- 4. What is the revenue generation potential (to offset revenue requirement) for Con Edison from conversion and referral fees associated with targeted offers?

The overall benefits of the demonstration project fall into four categories: Customer engagement – providing increased comfort, control and energy options; revenue from DER leads and conversions; cost to serve savings – resulting from insightful personalized communications and self-service digital tools; and energy efficiency – savings generated from behavioral changes and customer purchases in products on the Marketplace and audit and retrofit services. Con Edison's demonstration filing, approved by the NY PSC, included a forecast of cumulative benefits attributed to the Connected Homes Platform and a projected net positive overall societal benefit by the end of the demonstration project. However, traditional benefit cost analysis is not the primary indicator of the demonstration project's success. The project will provide insights and experience that can inform the design of future utility programs and revenue generating activities. In this sense, the Connected Homes Platform offers an opportunity to collect data that can be applied to the deployment of future programs and activities at Con Edison and throughout the State of New York.

Measurement and Evaluation

Using a randomized control trial model, Con Edison should be able to look at all DER sales in the demonstration project territory of Brooklyn and Westchester County and determine which were driven by engagement in the platform and from receiving targeted, personalized communications. The demonstration project is scheduled to run for two years with an expanded number and type of products coming into the platform and a more competitive approach for getting DER providers to participate over time. Con Edison will simultaneously be running its portfolio of energy efficiency programs, and savings will be attributed to those programs and not this demonstration project. The energy savings benefit achieved and attributed to the demonstration project will be from the specific energy efficiency products and services unique to the demonstration project including home audit and retrofit services offered by Sealed, as well as the rebates for promoted products available on the Marketplace Storefront.

Results from the demonstration project will be available for analysis starting in Q4 2016. Early validation of some project goals and hypotheses is demonstrated by the initial interest and commitment of DER providers to participate.

Conclusion

As New York continues down the path of Reforming the Energy Vision, utility led demonstration projects will generate real world results from which to design achievable market and regulatory policy. A main pillar of New York REV is increased customer adoption of distributed energy resources and subsequently driving cost effective benefits for customers and the electric distribution grid. As described in this paper, Con Edison and Opower have partnered

to test and validate whether customers are more likely to invest in DERs if customers are engaged and educated about their energy usage, and able to learn about the right DERs for their household by communicating contextually relevant offers at the right time and through the right channel. The New York DER market as a whole stands to benefit by lowering acquisition costs through better customer targeting within proven and trusted utility communication channels. The results of this demonstration project from mid-2016 through mid-2018 will help inform the New York Public Service Commission, the utilities, DER providers and customers about what is possible in the new energy future of REV.

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