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**ENERGY RESEARCH AND DEVELOPMENT DIVISION
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Building Resiliency from Within

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PREFACE

The California Energy Commission's (CEC) Energy Research and Development Division supports energy research and development programs to spur innovation in energy efficiency, renewable energy and advanced clean generation, energy-related environmental protection, energy transmission, and distribution and transportation.

In 2012, the Electric Program Investment Charge (EPIC) was established by the California Public Utilities Commission to fund public investments in research to create and advance new energy solutions, foster regional innovation, and bring ideas from the lab to the marketplace. The EPIC Program is funded by California utility customers under the auspices of the California Public Utilities Commission. The CEC and the state's three largest investor-owned utilities—Pacific Gas and Electric Company, San Diego Gas and Electric Company, and Southern California Edison Company—were selected to administer the EPIC funds and advance novel technologies, tools, and strategies that provide benefits to their electric ratepayers.

The CEC is committed to ensuring public participation in its research and development programs that promote greater reliability, lower costs, and increase safety for the California electric ratepayer and include:

- Providing societal benefits.
- Reducing greenhouse gas emission in the electricity sector at the lowest possible cost.
- Supporting California's loading order to meet energy needs first with energy efficiency and demand response, next with renewable energy (distributed generation and utility scale), and finally with clean, conventional electricity supply.
- Supporting low-emission vehicles and transportation.
- Providing economic development.
- Using ratepayer funds efficiently.

For more information about the Energy Research and Development Division, please visit the [CEC's research website](http://www.energy.ca.gov/research/) (www.energy.ca.gov/research/) or contact the Energy Research and Development Division at ERDD@energy.ca.gov.

ABSTRACT

California is facing the dual challenges of decarbonizing its electric grid and addressing spikes in electricity demand due to ever more frequent and severe heat waves. Decarbonization requires increasing the supply of energy from renewable sources like wind and solar. However, these intermittent energy sources may not be available when energy demand is highest. When electricity demand outpaces energy supply, utilities are forced to turn on polluting “peaker plants,” or in extreme cases, institute rolling blackouts.

In response, the state pursued several strategies to address both the supply and demand sides of the energy equation. One such strategy is residential demand response software that encourages utility customers to reduce their energy use when the electric grid is stressed. OhmConnect is the leading independent company in this space, with more than 200,000 users in California who have saved a total of nearly nine gigawatt-hours of energy – roughly the equivalent of powering nearly seven million homes for an hour.

This Electric Program Investment Charge grant project sought to determine the most cost-effective ways of acquiring new demand response customers and reducing peak residential energy demand. The project set a goal of acquiring at least 40,000 new customers and delivering 25 megawatts in energy savings during the peak periods of August and September 2021, or approximately enough energy to power 19,000 homes.

The project largely achieved its main goals by enrolling more than 41,000 new customers and achieving 28.8 megawatts of new energy reductions by the end of summer 2022.

The addition of 28.8 megawatts of flexible demand not only relieves grid stress in the immediate term but also mitigates the need for fossil-fuel powered “peaker” power plants, which are often located in or near disadvantaged communities, posing significant health risks to nearby residents.

Keywords: CCA, Community Choice Aggregation, energy use reduction, electric grid resilience, demand response, heat waves

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Executive Summary

Background

California is facing the dual challenges of decarbonizing its electric grid and addressing spikes in electricity demand due to ever more frequent and severe heat waves. Decarbonization requires increasing the supply of energy from renewable sources like wind and solar. However, these intermittent energy sources may not be available when energy demand is highest. When electricity demand outpaces energy supply, utilities are forced to turn on polluting “peaker plants,” or in extreme cases, institute rolling blackouts.

In response, the state pursued several strategies to address both the supply and demand sides of the energy equation. One such strategy is residential demand response software that encourages utility customers to reduce their energy use when the electric grid is stressed. OhmConnect (OC) is the leading independent company in this space, with more than 200,000 users in California who have saved a total of nearly nine gigawatt-hours of energy – roughly the equivalent of powering nearly seven million homes for an hour. Since its founding in 2014, OC played an integral role in the state’s efforts to reduce energy demand, lower emissions, and prevent blackouts.

In 2016, OC received a \$3 million Electric Program Investment Charge (EPIC) (EPC-15-083) grant from the California Energy Commission to increase customer engagement and acquisition and to provide further relief for California’s electric grid. OC received a second \$3 million EPIC grant in 2021 (EPC-20-034) to continue this work. This report shares the results and conclusions from the 2021 EPIC grant project.

Project Purpose and Approach

Building on OC’s previous EPIC grant in 2016, the 2021 EPIC grant project sought to determine the most cost-effective ways of acquiring new demand response customers and reducing peak residential energy demand. The project set a goal of acquiring at least 40,000 new customers and delivering 25 megawatts of incremental load reductions during the peak periods of August and September 2021, or approximately enough energy to power 19,000 homes.

Secondary goals included increasing the number of users in disadvantaged communities and increasing the number of connections with grid-responsive smart devices. For this report, disadvantaged communities are defined as a census tract scoring in the top 25 percent in California, according to CalEnviroScreen 4.0.

The project employed and evaluated a variety of strategies, including advertising via multiple media marketing channels; earned media coverage; partnerships with Community Choice Aggregation (CCA) electricity providers; and partnerships with smart thermostat manufacturers like Google Nest.

Key Results

The project largely achieved its four main goals by 1) enrolling more than 41,000 new customers between June 1, 2021 and September 30, 2021; 2) achieving 28.8 megawatts of new energy reductions during the August 31, 2022 to September 9, 2022 heat wave, 77 percent through the automated control of devices as reported in OhmConnect's PY 2022 Load Impact Protocol report; 3) connecting Wi-Fi enabled smart devices for more than 54 percent of new users and successfully toggling more than 150,000 devices (smart thermostats or smart plugs) off and on during events, and 4) enrolling 32 percent new low-to-moderate income users, and 14 percent who reside in disadvantaged communities.

The addition of 28.8 megawatts of flexible demand not only relieves grid stress in the immediate term but also mitigates the need for fossil-fuel powered "peaker" power plants, which are often located in or near disadvantaged communities, posing significant health risks to nearby residents.

The most cost-effective customer acquisition channels identified through the project, estimated to be less than \$50 per customer, were partnerships with device manufacturers. Partnerships with CCA electricity providers were also quite effective. Traditional advertising and earned media proved effective, though costly, and are estimated at over \$200 per customer.

The project also highlighted that the click-through data authorization process required by the California Public Utilities Commission for enrolling new customers served as a barrier to growth due to the cumbersome data authorization process.

Knowledge Transfer and Next Steps

The project demonstrated OC's ability to rapidly acquire customers and produce energy savings for the state. It also showed that OC's unique approach of using financial rewards to incentivize reduced energy use is appealing to consumers and effective for the grid operator.

By doubling down on the most effective methods identified in this project, OC is poised to continue to deliver energy savings for California. Based on the results of this project, OC has already negotiated expanded partnerships with smart thermostat and appliance manufacturers such as SunPower, Rheem, Carrier, and LG; and also negotiated partnerships with 10 CCAs. These two channels represent the lowest-friction paths for customer acquisition. OC has also used data from this project to provide feedback to the California Public Utilities Commission on the challenges associated with the click-through process to remove one of the largest barriers to the growth of third-party demand response providers.

OC will share results from the project with industry stakeholders through forums such as the California Efficiency Demand Management Council and the Peak Load Management Alliance.

CHAPTER 1:

Introduction

OhmConnect (OC) is the state's leading residential demand response (DR) aggregation company, with a simple message to its customers: save energy, get paid. OC's objective is to empower customers to take charge of their energy use, enabling customers to participate in the wholesale DR market and receive compensation for doing so. Active OC customers can earn \$40 to \$150 a year by saving energy and referring friends and family to join the service. OC meets its goals through a software platform that manages an individual's energy use to reduce demand through behavioral and/or automated responses to DR events, called OhmHours, which are 1- to 4-hour events in response to the Day Ahead Market, and AutoOhms, which are 15-minute to 4-hour events in response to the Fifteen Minute Market.

OC's original 2016 Electric Program Investment Charge (EPIC) grant (EPC-15-083) helped bridge a gap in residential DR in the California electricity market and paved a pathway for third parties to empower consumers to shift their electricity consumption according to market signals and grid needs. Before this project, no residential customer had responded to price signals from the California Independent System Operator (CAISO) via a third-party program despite clear interest in participation by thousands of consumers.

In response to climate change, California dramatically increased the amount of solar-generated power on its electrical grid. Because solar power can only be generated when the sun is shining, however, this increased reliance on solar energy created a challenge for the reliable operation of the grid, with increasing threats of power outages in the early evening hours when residential consumption ramps up at the same time as the sun is going down. During a prolonged heat wave affecting most of the Western United States on August 14 and 15, 2020, California's grid operator was forced to institute rolling power outages affecting hundreds of thousands of Californians.

During the August 2020 heat wave, OC played a significant role in providing critical grid support, demonstrating the potential of residential DR. OC saved 1 gigawatt-hour (GWh) of energy with a peak capacity of 100 megawatts (MW) across nearly 150,000 active customers. On average, each customer provided >0.6 kilowatt (kW) of peak capacity and >6 kilowatt-hours (kWh) of reductions. OC customers with automated energy devices¹ reduced energy consumption significantly more than customers without smart energy devices.

In the wake of the August 2020 power outages, California pursued many strategies to address this problem, including increasing overall energy production, increasing energy storage capacity, and working with large-scale energy customers to reduce demand at peak times.

In 2021, OC received a follow-up EPIC grant, providing \$3 million to extend the success of the EPC-15-083 grant by cost-effectively increasing customer acquisition and cost-effectively increasing customer yield (customer yield is defined as the average amount of energy reduced

¹ Most devices are either smart thermostats or smart plugs. Smart plugs can be used to control most in-home energy-using appliances or devices, such as window air conditioning units, refrigerators, and lights.

per customer). By achieving these two goals, OC sought to bring immediate relief to California's electric grid reliability challenges and to create a sustainable growth pathway to increase capacity in subsequent years. The project also sought to increase the enrollment of customers in disadvantaged communities and increase the engagement of grid-responsive smart devices.

Below are the quantitative metrics the grant project set out to achieve:

- Enroll 40,000 new customers into the CAISO wholesale market.
- Achieve 25 MW of energy reductions from new customers by September 30, 2021.
- Enroll 12,000 new customers (30 percent) from disadvantaged communities.
- Connect Wi-Fi enabled smart devices for >30 percent of newly enrolled customers (12,000).

CHAPTER 2:

Project Approach

Although there is no cost to the consumer to sign up for OC, the service has faced substantial challenges to growth over the past several years. Major challenges included a lack of consumer awareness and name recognition of OC, a lack of consumer trust in an unknown energy company, the technical difficulty of signing up for the service, and technical difficulties in connecting smart energy devices to the OC platform. A key goal of this project was to determine cost-effective means of overcoming these challenges.

In developing the approach for this project, the OC team sought to test several different customer acquisition channels in specific geographic regions of the state. This was done by comparing customer acquisition results in targeted areas with other geographic areas in which OC did not directly communicate with potential customers.

Efforts were focused on channels for customer acquisition that had not yet been tested by OC's acquisition campaigns but had shown promise in reaching OC's target populations and in promoting other energy-related products and services and/or incentive programs. These acquisition channels can be broadly broken into three main categories: multi-media marketing, "earned" media marketing, and strategic partnerships.

1. Multi-Media Paid Marketing

A common approach to multi-media marketing is the "funnel" approach, in which an effort is first made to raise awareness about the product or service; once the consumer is made aware of the service, the message and value proposition are reinforced at least 4 to 7 times; the consumer is brought to the point of deciding to "purchase" the product or service; and finally, the consumer acts (Figure 1).

At the top of the funnel, OC sought to build consumer awareness of the campaign with broad-based advertising in broadcast TV, cable, over-the-top video, radio, billboards, bus signs, and Volta EV charging stations. A central goal of the marketing strategy was to ensure that consumers who are likely to join OC would see messages many times in a variety of channels.

Once OC built consumer awareness, the marketing team used retargeting via Facebook, Reddit, Twitter, NextDoor, Snapchat, and direct mail to drive consumers to the OC website at the moment when recall/interest aligned in the digital channels. Finally, the team employed targeted ads with Google Search and Bing Search.

It is difficult to get a consumer to see a TV ad or billboard and then go to their telephone or computer to sign up for a new service. The goal, therefore, was to use the budget as cost-effectively as possible to introduce OC with attention-getting ads. Once consumers have seen the ads, they are much more likely to respond to digital advertising, which allows them to click on the ad to sign up for OC's service.

Figure 1: Marketing Funnel



Source: OhmConnect

Awareness: TV / Cable / CTV / Display / YouTube Radio / Audio / Billboard / Bus Signs / Volta EV Charging Stations

Interest: Support from OC via Facebook, NextDoor, Reddit, Twitter, Snapchat, Direct Mail

Decision: Google ads, Bing

Action: The consumer signs up on the OC site and clicks through to the investor-owned utility (IOU) site to authorize data sharing

a. Campaign Messages

To attract the interest of the most potential customers and provide a compelling reason to reduce energy use by signing up for OC and installing a smart thermostat, OC developed two overarching messages for the campaign: “**EndCABlackouts**” and “**1 Million Smart Thermostat Giveaway**”.

- EndCABlackouts conveys a sense of urgency and refers to the blackouts that hundreds of thousands of Californians experienced during the heat wave and power outages of August 2020. The campaign appealed to customers’ sense of collective responsibility to help the state put an end to blackouts by taking steps to power down.
- 1 Million Smart Thermostat Giveaway offered a more traditional, self-interested appeal, offering the opportunity to receive a desirable product for free.

OC engaged a marketing firm to develop advertisements, marketing material, and social media posts (Figure 2, Figure 3, and Figure4). Working on a tight timeline, OC launched the campaign in early June and continued through the end of September.

b. Campaign Timeline

June

- 6/7: Launch of digital ads with video
- 6/14: Full campaign launch
- 6/28: Energy Upgrade California and PG&E begin TV ads

July

- 7/1-7/11: Paused TV/radio ads due to confusion caused by competitor ads
- 7/20: Added Nest ads; tested Evergreen and Flex Alert ads

August

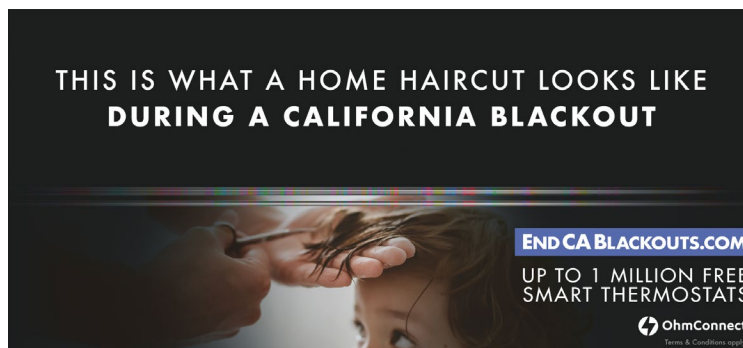
- 8/1: Geographic targeting refined to emphasize areas where OC was successful; added new billboards and bus signs
- 8/16: Due to the pending gubernatorial recall campaign, TV ad time became very expensive, causing OC to pause TV ads

September

- 9/30: End of marketing campaign

c. Sample Ads

Figure 2: Billboard Ad



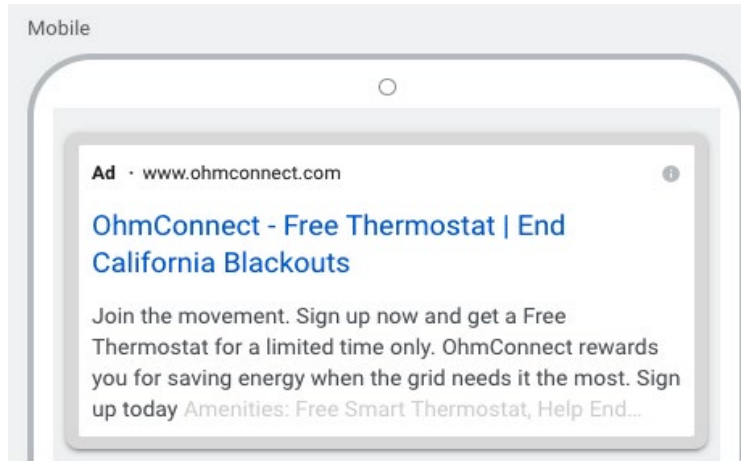
Source: OhmConnect

Figure 3: Digital Display Ad



Source: OhmConnect

Figure 4: Mobile Ad



Source: OhmConnect

d. Target Markets and Comparison Markets

To assess the effectiveness of the marketing efforts, OC established “comparison” markets that have similar climates and demographics as the marketing targets but did not directly receive ads or other marketing materials (Table 1). Comparison markets are similar to control groups but are used when individuals cannot be randomly assigned to a group. For this study, Fresno County and Kern County were the designated target markets. Lake County and San Benito County were the designated comparison markets. It should be noted that a statewide or regional marketing campaign doesn’t allow the same degree of control as a lab experiment. Although the marketing campaign targeted communications to Fresno County and Kern County and attempted to avoid communications to Lake County and San Benito County, some residents of Lake and San Benito counties nonetheless received some communications from the campaign. For example, Lake County borders Napa County and Sonoma County, which were both targets of the marketing campaign. If a resident of Lake County worked or traveled in Napa or Sonoma, they would likely see or hear some campaign advertisements. Similarly, San Benito County borders Monterey, Fresno, and Santa Clara counties, which were all targets of the marketing campaign. The results, therefore, should be interpreted as directionally accurate rather than absolutely accurate.

Table 1: Target and Comparison Markets

		Average Temp May-Sept 2021	Hispanic or Latino	White Alone	Asian Alone	Black Alone	Owner- Occupied Housing Rate	Households with broadband internet subscription 2015-2019	Persons in Poverty
Target Markets	Fresno County	93.75	53.8%	28.6%	11.1%	5.8%	53.3%	80.2%	20.5%
	Kern County	93.5	54.6%	32.8%	5.4%	6.3%	58.3%	79.7%	19.0%

		Average Temp May-Sept 2021	Hispanic or Latino	White Alone	Asian Alone	Black Alone	Owner- Occupied Housing Rate	Households with broadband internet subscription 2015-2019	Persons in Poverty
Comparison Market	Lake County	87.75	22.0%	68.9%	1.4%	2.1%	69.5%	76.6%	18.3%
	San Benito County	80.75	85.0%	10.0%	2.1%	3.3%	69.5%	90.2%	10.4%

Source: OhmConnect, U.S. Census Bureau Quickfacts, and National Weather Service

2. Earned Media: The City Energy Challenge

It can be significantly less expensive to communicate with consumers through “earned” media, as opposed to paid advertising. In this case, OC developed an earned media strategy to recruit mayors of California’s largest cities to engage in a friendly challenge to determine which city could recruit the most new OC customers during the summer of 2021 to help reduce the likelihood of power outages. OC offered free smart thermostats to all new users who signed up and connected their smart thermostats to the OhmConnect platform. OC dubbed the campaign the “City Energy Challenge,” and the winning city was awarded a \$50,000 prize for scholarships.

The mayors of four of California’s ten largest cities responded and chose to participate in the City Energy Challenge:

- Oakland Mayor Libby Schaaf
- San Jose Mayor Sam Liccardo
- Fresno Mayor Jerry Dyer
- Bakersfield Mayor Karen Goh

OC organized a virtual press conference on May 19, 2021, in which the four mayors joined OC CEO Cisco DeVries and California Energy Commission Commissioner Andrew McAllister to accept the challenge and urge their residents to sign up for OC, get a free smart thermostat, and help to reduce the chance of blackouts. The press conference received significant media coverage (see Appendix A).

Following the press conference, OC worked with each mayor’s office to provide support for their efforts to engage their residents. This support included drafting emails and social media posts, creating flyers, and developing other marketing materials.

3. Strategic Partnerships

In addition to paid and earned media marketing channels, the third dimension of OC’s customer acquisition strategy was strategic partnerships, which the company entered into with smart thermostat manufacturers and CCAs.

a. Smart thermostat manufacturers

OC negotiated agreements with the three largest smart thermostat manufacturers to be able to offer free devices to new customers who signed up, install the smart thermostats, and connect them to the OC platform. This free smart thermostat giveaway was designed not only to incentivize customers to sign up but to dramatically increase the amount of energy each customer would save (customer yield). OC's previous load impact protocol evaluations have shown that customers with smart thermostats and other smart devices save 4 to 5 times as much energy as those without them (CPUC, 2021; 2022; 2023).

A key element of the negotiation with the manufacturers is the agreement governing the application programming interface (API). The API can be thought of as the contract between two different applications. In this case, it allows OC to send a signal either directly, or through the manufacturer, to adjust the thermostat during OhmHours (energy-saving events). When OC negotiated partnerships with the three major smart thermostat manufacturers, the agreements gave OC the ability to control thousands of thermostats, either directly or through the manufacturer. The customer must provide permission for OC to be able to adjust their thermostat; the customer always retains the ability to override that control. Turning hundreds of thousands of in-home devices off and on poses significant technical challenges. OC has pioneered this technology and expanded its application dramatically during this project. This required substantial software programming to shift from manual control of a few hundred devices to automated control of tens and even hundreds of thousands of devices.

OC also asked the manufacturers to communicate with their existing customers to urge them to sign up for OC. One of the smart thermostat manufacturers, for example, agreed to send quarterly emails to their existing customers – resulting in thousands of new sign-ups for virtually no cost.

b. Community Choice Aggregators (CCAs)

During the summer of 2021, OC negotiated partnership agreements with four CCAs (San Jose Clean Energy, Valley Clean Energy, Lancaster Energy, and Apple Valley Clean Energy). In each case, the company offered to provide free smart thermostats to the CCA's customers if they would sign up with OC and connect their devices to the platform. The CCAs agreed to send emails to their customers, urging them to sign up for OC and receive a free smart thermostat.

The most successful of these partnerships was with San Jose Clean Energy (SJCE). San Jose Mayor Lickardo participated in the City Energy Challenge and also worked with SJCE to urge San Jose residents to sign up for OC, receive a free smart thermostat, and connect their thermostats to the OC platform. In addition to the customer emails from SJCE, Mayor Lickardo sent an email to San Jose residents urging them to sign up.

CHAPTER 3:

Results

1. Multi-media Paid Marketing Results

The statewide marketing effort was successful in achieving its customer acquisition and customer yield goals and driving significant traffic to the OC website. The summer marketing campaign generated significant traffic through all channels and led directly to achieving the goals of the project (Figure 5). However, the paid marketing campaign was expensive on a per-customer basis, costing more than \$200 to acquire each new user.

Figure 5: Marketing Funnel Results



Source: OhmConnect

Awareness: The paid and earned media campaigns were viewed multiple times by millions of Californians throughout the state

Interest: The media campaign generated more than 3.7 million page views of the OhmConnect website with nearly 1.2 million unique visitors

Decision: Nearly 100,000 users initiated sign-up on the OC website

Action: 41,175 new users were able to complete sign up by connecting to their IOU and authorizing the IOU to share their usage data with OC

2. Target Markets vs. Comparison Markets

In the target markets of Fresno and Kern counties, the rate of new sign-ups and connections was nearly three times the rate in the comparison counties of Lake and San Benito. Approximately 0.5 to 0.6 percent of the total households in each Fresno County and Kern County signed up within 120 days, compared to just 0.2 percent in Lake and San Benito counties – indicating that the marketing campaign was the likely cause of the strong growth in customer acquisition. As noted earlier in the discussion of target vs. comparison markets, it

was not possible to ensure that residents of the comparison markets received no communication from the marketing campaign. The comparison counties, Lake and San Benito, share borders with counties that received substantial marketing communications – and therefore likely received spillover communications. However, the overall results indicate that the marketing campaign had significantly more impact in the target counties. Table 2 provides sign-up data from the target and comparison counties.

Table 2: Target Market Versus Comparison Market Results

	May	June	July	August	September
Fresno	.01	.21	.39	.55	.58
Kern	.01	.20	.37	.48	.55
Lake	.02	.15	.21	.31	.39
San Benito	0	.09	.11	.19	.20

Cumulative percent of utility connections of households by county.

Source: OhmConnect customer acquisition data

3. Earned Media Results

The May 19, 2021 press conference generated a great deal of media coverage (see Appendix A), which resulted in more than 40,000 page views of the OC website, and 542 new sign-ups on that one day – about 250 more new users than on a typical day during May of 2021. Indeed, there were more than 200,000 page views of the OC website during the full week of May 17, 2021. However, it was difficult to sustain earned media momentum over the days and weeks following the press conference. And, importantly, it is difficult to attribute sign-ups directly to the earned media campaign. It is not possible to track a sign-up from a new customer who has seen a TV news show or read an article.

Anecdotal evidence showed that the earned media campaign helped build trust in OC because well-known elected community leaders spoke out and urged their residents to sign up. This was important and undoubtedly bolstered consumer confidence in OC.

4. Strategic Partnership Results

During the 2021 EPIC project, OC tested strategic partnerships with a variety of organizations and companies. Overall, strategic partnerships in summer 2021 resulted in nearly 20,000 new sign-ups, with 10,500 new utility-connected customers – approximately 25 percent of all new customers (Table 3). By far, the most successful of these were the partnerships with smart thermostat manufacturers and CCAs.

A key success of these partnerships is that they have continued – and expanded – far beyond the term of the original marketing effort in summer 2021.

Table 3: Strategic Partner Customer Acquisition Results

	Device Manufacturers	CCAs
2021 (May-Oct)	6,832	1,631
2022-2023	12,408	2,499
TOTAL	19,240	4,130

Source: OhmConnect customer acquisition data

Importantly, the cost of acquiring these new customers is less than \$50 per household for smart thermostat manufacturers and CCAs – making them each a sustainable long-term channel of new customer acquisition.

Also importantly, by definition, the smart thermostat customer is a smart device owner; smart device owners save 4 to 5 times more energy on average than those without devices. This channel proved to be extremely important in reaching one of the goals of the project, which was to connect Wi-Fi-enabled smart devices for at least 30 percent of newly enrolled customers.

Based on the success of these partnerships, since 2021, OhmConnect developed ongoing partnerships with 10 CCAs (Lancaster Clean Energy; Apple Valley Clean Energy; Clean Energy Alliance; Pico Rivera Innovative Municipal Energy; Pomona Choice Energy; Rancho Mirage Energy Authority; Santa Barbara Clean Energy; Energy for Palmdale’s Independent Choice; Desert Community Energy; and San Diego Community Power) and negotiated partnership agreements with many leading smart energy appliance manufacturers, including SunPower, Carrier, LG, Sense and Rheem. The team is also working on negotiations with several other leading manufacturers.

Load Reduction Reporting

This project has achieved the rapid acquisition of more than 41,000 new customers and enabled 28.8 MW of flexible demand during the peak summer months of 2022. This project utilized Wi-Fi enabled smart devices for more than 54 percent of new users and successfully toggled more than 150,000 devices (smart thermostats or smart plugs) off and on during events.

Approximately 32 percent of new OC customers were low-to-moderate income customers (California Alternate Rates for Energy [CARE]/Family Electric Rate Assistance Program [FERA]) who gained access to smart devices and accompanying incentives of \$60 to \$100 per year for reducing their energy use. About 14 percent of the new OC customers enrolled under this project funding reside in disadvantaged communities.

The load reduction results are based on OhmConnect’s PY 2022 Load Impact Protocols report, which shows the maximum per participant load impact for device users was 1 kW per event (CPUC, 2021). The maximum per-participant load impact for non-device users was 0.35 kW

per event. Of the 41,175 new users recruited during the June 1, 2021 to September 30, 2021 period, 54 percent were device users, and 46 percent were non-device users. Therefore, device users reduced load by 22.2 MW, and non-device users reduced load by 6.6 MW, for a total of 28.8 MW during the August 31, 2022 to September 9, 2022 heat wave.

CHAPTER 4:

Conclusion

Building on the success of OC's earlier grant (EPC-15-083), this project identified two new cost-effective methods of acquiring customers and persuading them to engage in saving energy at peak times. Specifically, the project demonstrated that the two most cost-effective customer acquisition channels were partnerships with device manufacturers and partnerships with CCAs.

The project further identified a new means of persuading customers to obtain and install smart thermostats, which have the effect of significantly increasing a household's energy savings. OC was able to negotiate favorable terms with several smart thermostat manufacturers, allowing OC to offer the smart thermostats to new customers for free. Once the devices were installed, consumers were able to save 4 to 5 times as much energy as they would have without the automated devices.

Based on the success of these partnerships, since 2021, OC developed partnerships with 10 CCAs and negotiated partnership agreements with many leading smart energy appliance manufacturers, including SunPower, Carrier, LG, Sense, and Rheem. OC also entered into negotiations with several other leading manufacturers.

Outside of developing new methods for customer acquisition, and new means for encouraging the adoption of smart thermostats, this project also brought substantial and immediate benefits to California ratepayers. These benefits included:

- The rapid acquisition of more than 41,000 new customers enabled 28.8 MW of flexible demand during the peak summer months of 2022,² helping to relieve grid stress and prevent power outages.
- Enabled approximately 32 percent of new OC low-to-moderate income customers (CARE/FERA) access to smart devices and accompanying incentives of \$60 to \$100 per year for reducing their energy use.

The addition of 28.8 MW of flexible demand not only relieves grid stress in the immediate term but also mitigates the need for fossil-fuel powered "peaker" power plants. Many of these fossil-fueled plants are located in or near disadvantaged communities, posing significant health risks to nearby residents.

The project also identified the click-through enrollment process as a potential contributor to limitations in user acquisition and potentially higher customer acquisition costs. To become enrolled in the CAISO energy market, a customer must first go to the OC website and provide

² Figure 31 in OhmConnect's PY 2022 Load Impact Protocols report shows the maximum per participant load impact for device users was 1 kW per event. The maximum per participant load impact for non-device users was 0.35 kW per event. Of the 41,175 new users recruited during the June 1-September, 30 2021 period, 54 percent were device users and 46 percent were non-device users. Therefore, device users reduced load by 22.2 MW and non-device users reduced load by 6.6 MW, for a total of 28.8 MW during the August 31, 2022 to September 9, 2022 heat wave.

their name and contact information. The customer is then redirected to the click-through process of their IOU website which authorizes the IOU to give OC access to the customer's smart meter data. This second step proved to be a barrier to entry for new customers. Marketing efforts were successful in bringing more than 1.2 million potential customers to the OC website, and nearly 100,000 potential customers began the sign-up process. However, only 40 percent completed the process after being redirected to the IOU click-through process. This drop in completion rate falls short of the 64 percent for registration forms as reported by Zuko (2024). The OC team believes this is likely due to a non-user-centric interface on the IOU click-through side and may be a limiting factor for the growth of third-party DR programs, which in turn hinders the ability of third-party DR programs to relieve grid stress at times of peak demand. The growth of third-party DR programs depends on an easier customer enrollment process. In May 2021, OC and several additional third-party DR programs submitted a joint opening brief that outlined some of the main shortcomings identified in the IOU's application for improvements to the click-through authorization process (CEDMC, 2021). Several changes were made in late 2023, however, as of May 2024, the click-through process remains a barrier for third-party enrollments. The OC team will further investigate this issue in future studies.

Partnerships, particularly partnerships with device manufacturers, are an excellent way to not only leverage resources but to leverage brand recognition. A partnership with a well-known company like Google Nest allows a relatively little-known company like OhmConnect to rapidly gain credibility in the eyes of the customer. This dramatically boosts sign-up rates. It is therefore critical that marketing efforts include these types of partnerships.

GLOSSARY AND LIST OF ACRONYMS

Term	Definition
API	application programming interface
CAISO	California Independent System Operator
CARE	California Alternate Rates for Energy
CCA	Community Choice Aggregation
CEC	California Energy Commission
DR	demand response
FERA	Family Electric Rate Assistance Program
GWh	gigawatt-hour
IOU	investor-owned utility
kW	kilowatt
kWh	kilowatt-hour
MW	megawatt
OC	OhmConnect
SJCE	San Jose Clean Energy

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