BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Consider Alternative-Fueled Vehicle Programs, Tariffs, and Policies.	Rulemaking 13-11-007 (Filed November 14, 2013)

ELECTRIC VEHICLE-GRID INTEGRATION PILOT PROGRAM ("POWER YOUR DRIVE") SIXTH SEMI-ANNUAL REPORT OF SAN DIEGO GAS & ELECTRIC COMPANY (U902-E)

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May 10, 2019

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OF THE STATE OF CALIFORNIA

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Pursuant to Decision ("D.") 16-01-045 (the "Decision"),[1] and Commission Rules 1.8, 1.9(d) and 1.10(c), San Diego Gas & Electric Company ("SDG&E") submits this Electric Vehicle-Grid Integration ("VGI") Pilot Program ("Power Your Drive") Sixth Semi-Annual

[1] *See,* Decision, p. 139; finding of fact ("FOF") 80, p. 173, ordering paragraph ("OP") 3.k, p. 183:

> We will also require SDG&E to file in R.13-11-007, or in a successor proceeding, semi-annual reports containing the information reported in the quarterly check-in meetings, the data described in Appendix B to Attachment 2 of this decision, and a description of any program changes implemented by SDG&E prior to the date of the report. This reporting requirement will terminate on February 1, 2021. The report shall be posted on SDG&E's website, and a notice of the availability of that report shall be served on the R.13-11-007 and A.14-01-014 service lists [note that the Decision (pp. 156, 161, 183) closed A.14-04-014].

Id., FOF 80, p. 173:

> The alternative program terms shall include the following: SDG&E shall have quarterly check-in meetings with the Commission's Energy Division to provide the staff with updates concerning the information set forth in today's decision; SDG&E shall file semi-annual reports in R.13-11.007, or a successor proceeding, containing the information described in today's decision, and in the manner described in today's decision; and parties may file and serve opening and reply comments on the semi-annual reports in the manner described in today's decision.

Id., OP 3.k., p. 183:

> If SDG&E decides to accept and to implement the 2016 VGI Pilot Program, SDG&E shall comply with all the meeting and reporting requirements as set forth in this decision and in Attachment 2.

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Report. This report, Attachment A hereto, is also posted on SDG&E's website as indicated in the Notice of Availability filed concurrently herewith.

Respectfully submitted

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May 10, 2019

ATTACHMENT A

SDG&E SEMI-ANNUAL REPORT

San Diego Gas & Electric

Semi-Annual Report

ELECTRIC VEHICLE-GRID INTEGRATED PILOT PROGRAM (POWER YOUR DRIVE) SEMI ANNUAL REPORT OF SAN DIEGO GAS & ELECTRIC COMPANY (U902-E) APRIL 2019

I. Introduction

San Diego Gas & Electric ("SDG&E") established the Power Your Drive ("PYD") Program ("Program"), after it was approved by the California Public Utilities Commission ("CPUC"), as a pilot program in January 2016. The Program is designed to reduce greenhouse gas (GHG) and other air emissions, increase adoption of electrical vehicles and integrate the charging of electric vehicles ("EVs") with the grid through a day-ahead hourly rate. Power Your Drive seeks to satisfy these objectives through the installation of up to 3,500 EV charging stations at apartments, condominiums and places of work.

Under the terms of PYD, SDG&E maintains ownership of the infrastructure to simplify the experience for customers and to ensure the reliability of the charging network. Customers that participate in the Program are assessed a nominal one-time participation payment unless the site is within a designated disadvantaged community, in which case, the participation payment is waived. Customers have the option to choose from two Electric Vehicle Service Providers ("EVSP") who have been qualified to provide Electric Vehicle Supply Equipment ("EVSE"). SDG&E coordinates the design, permitting, construction, and commissioning of the charging stations. Once drivers begin charging, SDG&E handles the billing, provides customer support, and maintains the charging equipment.

PYD sites are either multi-unit dwellings ("MUDs") or workplaces. The CPUC established goals to deploy at least 40% of installations in MUDs and to deploy installations in areas that have higher than average levels of pollution by setting a target of at least 10% of installations in designated Disadvantaged Communities ("DACs").

This is the sixth Semi-Annual Report that SDG&E has issued on the Program, as required by Decision D.16-01-045 ("Decision"). Data for this reports extends from Program inception to February 28, 2019.

II. Executive Summary

Power Your Drive was designed to align the State of California's greenhouse gas reduction and transportation electrification policies with both the utility's and its customers' interests. Based on initial analysis, SDG&E believes that PYD is achieving these goals. Not only does PYD show strong customer interest in the Program and electric vehicles in general, but it also demonstrates that customers are modifying their charging behavior in ways that:

- Reduce GHG and other air emissions;
- Integrate renewable energy and decrease the need to dispatch conventional peaking generation;
- Leverage existing resources and grid assets;
- Lower consumer fuel costs and increase the use of electricity as a transportation fuel; and
- Increase investments and deployment of infrastructure in disadvantaged communities.

The results show that PYD is consistent with state policies promoting transportation electrification and GHG reductions. SDG&E also found that there is a demand for more chargers, as seen by site hosts often requesting more chargers than originally planned and the extended waiting list to participate in the program.

As of March 1, 2019, a total of 927 customers have indicated interest in participating in PYD, of which 49% are located in MUDs and 51% are located at workplaces. Of those having expressed interest, 254 customers have executed Site Agreements which will result in approximately 3,040 charging ports (significantly adding to the currently available approximately 1500 non-residential chargers in SDG&E's territory). Of the 254 customers with Site Agreements, 35% are within DACs, far exceeding SDG&E's 10% DAC target, and 39% are located in MUDs.

The innovative hourly dynamic rate ("VGI rate") has shown preliminary success in influencing pricing behavior. SDG&E will continue to monitor how drivers experience the VGI rate and educate customers on how to best utilize the unique benefit the rate provides to them.

As mentioned in previous reports, PYD has also experienced challenges. These challenges include software customizations to accommodate a VGI rate, EVSE vendor approvals and process, unanticipated compliance costs associated with the American with Disabilities Act ("ADA") requirements resulting from an unforeseen change in laws, and significant delays in acquiring easements. SDG&E utilized lessons learned and best practices to navigate these challenges. However, resolving these challenges increased costs beyond SDG&E's estimates at the inception of the Program.

The following report details the Program progression and preliminary results. The data in this report data is as of February 28, 2019.

Figure 1: Power Your Drive Status Dashboard

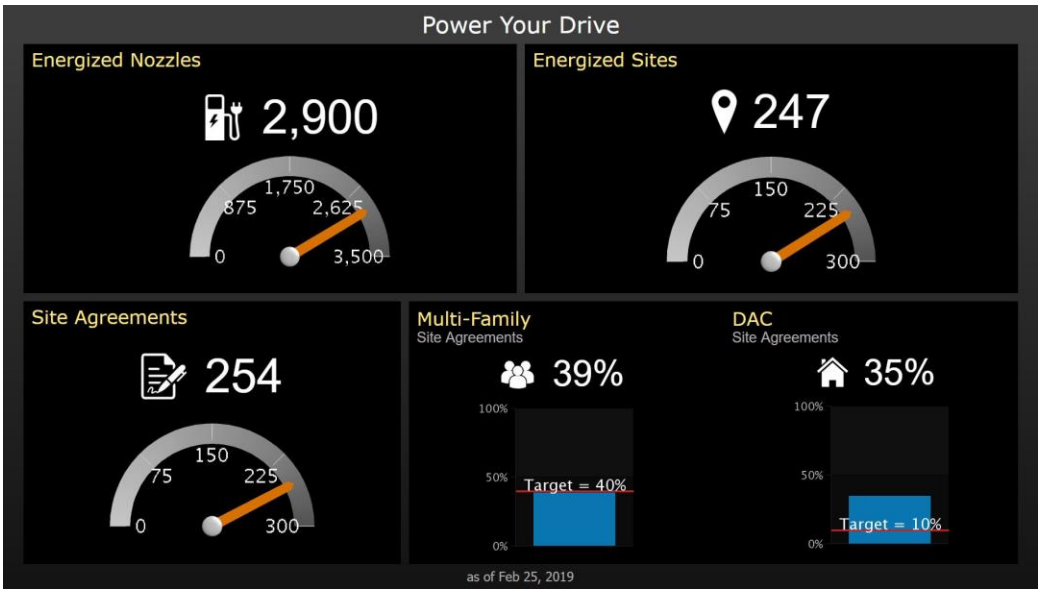


Figure 2: Power Your Drive Cost Summary

Cost Category	*Scaled Decision Assumptions*	*Inception-to-date as of 2/28/2019*	*Variance*
Materials	*$4,792,000*	*$13,482,414*	*($8,690,414)*
Construction	*$28,894,000*	*$24,963,549*	*$3,390,451*
Engineering Design	*$1,004,000*	*$7,222,970*	*($6,218,970)*
Environmental Testing	*$ -*	*$622,380*	*($622,380)*
Internal Labor	*$825,000*	*$2,246,273*	*($1,421,273)*
IT Billing System Upgrade[1]	*$1,564,000*	*$3,314,897*	*($1,750,897)*
Third Party Project Support	*$ -*	*$6,432,784*	*($6,432,784)*
Other	*$943,000*	*$1,815,654*	*($872,654)*
Non-Direct costs (AFUDC, Loaders)	*$3,429,000*	*$10,368,159*	*($6,939,159)*
Contingency	*$3,549,000*	*N/A*	*N/A*
Total	***$45,000,000***	***$70,469,080***[2]	***($25,469,080)***

Program costs exceeded the authorized budget of $45 million. SDG&E anticipated that building the Program within the Commission-approved budget would be challenging. However, due to the early market, SDG&E underestimated projected program costs. This mismatch was not identified during the initial stages of program implementation. When it became clear that expenses were running ahead of projections, SDG&E made course corrections that included reorganization of the program implementation team and protocols and bringing work in-house that had previously been performed by outside consultants. The column in Figure 2, the "Scaled Decision Assumptions," reflects assumptions and cost estimates developed upon receiving the

[1] Excludes IT costs to develop enterprise functionality that served Power Your Drive

[2] Costs as reported may not include credits and adjustments related to materials, construction, and non-direct costs pending final assessment after project completion.

Commission-modified program. The next column shows the actual cost up to February 28, 2019 and reflects three main areas where the budget estimates were significantly different than the estimates: materials, engineering design, and third-party project support.

Material costs were based on market estimates available at the time of program design. After this estimation, SDG&E detailed the charger specifications required to handle the billing requirements and VGI rate, then issued a Request for Proposals to the market. The actual costs from the third-party charging companies came in significantly higher than SDG&E's original estimates.

There were two main drivers that explain the variance in the engineering design costs: (i) the scope for engineering design was underestimated at the time of the decision, and (ii) many sites incurred multiple iterations of unanticipated redesign. These redesigns accommodated site host requests and reflected SDG&E's increased knowledge of how to optimize site designs.

Third party project support was not included in the first budget put together by SDG&E. However, as the program was being stood up, the project management team, based on use of such services on prior utility projects, believed that there were benefits to having third party project support, including speed to market. Consequently, SDG&E contracted with a third party to provide engineering design support and customer outreach. While the consultant did provide useful services, the costs exceeded expectations leading to SDG&E's decision to bring this work in-house. This decision, coupled with other process improvements designed to leverage SDG&E's expertise, helped begin to rein in implementation costs.

A portion of the unanticipated costs included start-up type costs that are typical in many large programs at the beginning of implementation. Start-up information technology (IT) costs are another area where actual costs came in higher than budgeted. SDG&E and third-party vendors worked in concert to design the systems necessary to implement the billing requirements and VGI rate, a day-ahead dynamic rate which is the first of its kind. This significant step was more complicated than originally contemplated. This resulted in additional costs to ensure the reliable transfer of data and accurate bills for customers. SDG&E recognizes that this required significant effort by our vendor partners and that the investments made allow the customer to have a seamless billing experience and to utilize the VGI rate which drives many of the program benefits.

Despite the cost overrun, SDG&E believes the Program has been a success, is delivering tangible benefits to customers and communities, and is accelerating progress towards the State's policy goals.

- EV Adoption: In this early stage of the Program, SDG&E estimates that customers bought or leased 500 plug in electric vehicles due to the Program.
- Innovative Rate: Preliminary data indicates that the hourly dynamic rate is influencing charging behavior to align with State GHG and energy policies.
- Demand: Customer interest exceeds what the existing Program can accommodate.

- Labor: SDG&E also used multiple skilled construction contractors to complete Program construction, bringing increased diversity and competition to the Program and creating high quality jobs.

III. Customer Engagement

During the latter half of 2018, the Program became fully subscribed for sites; however, SDG&E is still actively involved in customer engagement to ensure that utilization of the PYD chargers will continue to increase. SDG&E continues to create visibility for EV programs and engage the community through public events. An important element of the outreach campaign is to provide site hosts and drivers with detailed information about the existing Program to ensure they have a thorough understanding of how to best take advantage of the Program's features and benefits. Future education and outreach efforts will focus on expanding engagement with site hosts and drivers by providing additional tools, resources, and events to help increase utilization.

As an example of recent outreach, SDG&E recently piloted an in-person customer workshop at ThermoFisher Scientific campus where PYD installed 36 ports on February 13, 2019. SDG&E will work with site hosts and customers to determine when similar outreach events may be beneficial for both site hosts and drivers. In person events, workshops and webinars may provide an interactive platform to educate site hosts and drivers on how to best use the offered tools and resources, understand the VGI rate and other best practices for owning an EV.

Since the Program is fully subscribed, the site host application was removed from the Power Your Drive website landing page, and any new interest is referred to the poweryourdrive@sdge.com inbox, where follow-up is conducted to capture contact information and placed on an interest list.

Press Event

On September 12, 2018, PYD representatives participated in a press event at Helix Water District ("HWD"), celebrating their involvement in the Program and the acquisition of electric fleet vehicles by HWD. Representatives from HWD, SDG&E, and the cities of El Cajon, La Mesa and Lemon Grove were on hand to acknowledge HWD's acquisition of six plug-in hybrid Toyota Priuses as part of their fleet, as well as 10 electric vehicle charging ports that were installed as part of the Program. These sites are located at the district's operations center in El Cajon and their administration office in La Mesa, both of which are in DACs.

Outreach Efforts

Backed by SDG&E's mission statement of becoming the cleanest, safest, and most reliable energy company in America, SDG&E outreach maintains a clear focus on those guiding principles. With environmental sustainability and stewardship at the forefront of all community

engagement events, SDG&E is consistently engaging customers on the benefits of driving electric and the importance of electrifying the transportation sector. Since September 2018, SDG&E has conducted 17 public outreach events, with nine of those events directly allowing the company to engage attendees on PYD related topics and subsequent questions. Some of the more impactful events are outlined below.

Electric Vehicle Day

On September 15, 2018, SDG&E hosted its 6th annual EV Day as part of National Drive Electric Week. The San Diego event was named the largest in the world with over 2,500 people in attendance and more than 2,000 test drives experiences. As event organizer, SDG&E was able to create robust outreach where it discussed its programs in detail. SDG&E's most informed PYD representatives were on hand to interact with attendees and educate them on all PYD related topics.

SDG&E Dealership Incentive Dealer Training

On September 25, 2018, through the SB 350 Dealership Incentive Priority Review Project, SDG&E conducted in person training for car dealerships and salespeople participating in the pilot. This comprehensive training provided EV salespeople an education on current SDG&E EV-TOU rates, as well as programs in SDG&E's service territory, including PYD. As a direct influencer in the buying process, it was important that SDG&E informed salespeople of PYD and EV charging options for car buyers who may live or work at a PYD site. Additionally, customers can direct their MUDs or workplaces to apply for the Program.

Clean Air Day

On October 3, 2018, SDG&E participated in the inaugural Clean Air Day, a statewide effort sponsored by the Coalition for Clean Air. The event included a Community Resource Fair and wide-ranging, locally-prominent speakers, including: government officials (Assembly member Todd Gloria and Councilmember Georgette Gomez), SDG&E senior executives, Center for Sustainability, and members of the Coalition for Clean Air. Recognizing the need to affect and include all SDG&E customers, this event was held in a City Heights, a San Diego DAC. Through participation at this event, SDG&E had the unique opportunity to inform that audience of the Program.

SD International Auto Show

During the last week of December, SDG&E hosted the Think Blue Eco Center during the four-day San Diego International Auto Show. The purpose of this event was to provide attendees an introduction to the EV industry, display new EV models, and educate the attendees on

programs that are being offered by SDG&E. With thousands of customers in attendance, opportunities to discuss the Program and its MUD and workplace charging were abundant, and the SDG&E found a significant amount of public interest.

Employee Involvement

SDG&E understands the importance its employees play in advocating for the company and its Clean Transportation programs. SDG&E set a goal to have 500 employees driving electric vehicles by 2020 with its "Race to 500" campaign. This campaign was overwhelmingly successful and reached the target two years early. To keep the momentum going, SDG&E launched a new initiative, "It's On to 1,000," with the goal to have 1,000 employee EV drivers by 2023.

Employee EV drivers, all of whom have experience with workplace charging, make terrific champions of SDG&E's Clean Transportation programs. To leverage this knowledge, SDG&E recently introduced the EV Ambassador Program, in which the most passionate and dedicated EV drivers within the company are encouraged to publicly promote SDG&E's transportation initiatives, including the Program. They are trained internally by subject matter experts, so that they possess the information necessary to appropriately address related questions.

IV. Reporting Requirements

This section provides requisite data points as defined and approved in AL 2876-E. A summary of this data can be found in Appendix-A of this report.

A. Customer Interest

The Program received significant customer interest. As of February 28, 2019, 927 site hosts indicated interest in participating in the Program. Of this group, 458 (49%) are multifamily sites and 469 (51%) are workplace locations. The graphs below further detail the port distribution across different market segments that the Program serves.

Figure 3: Interest List Site Distribution

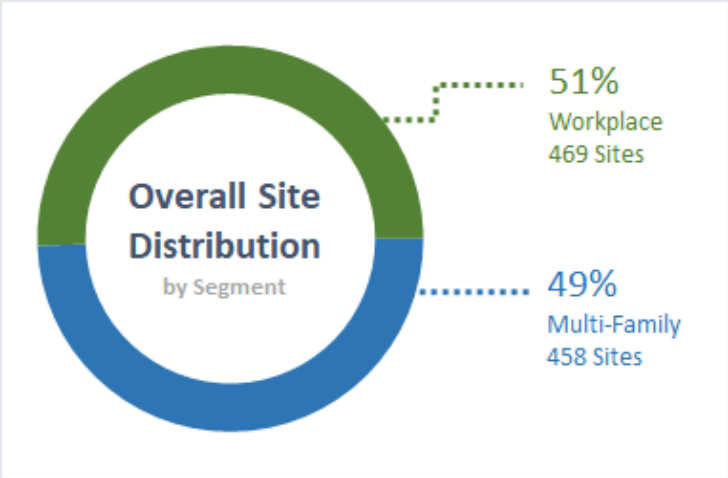
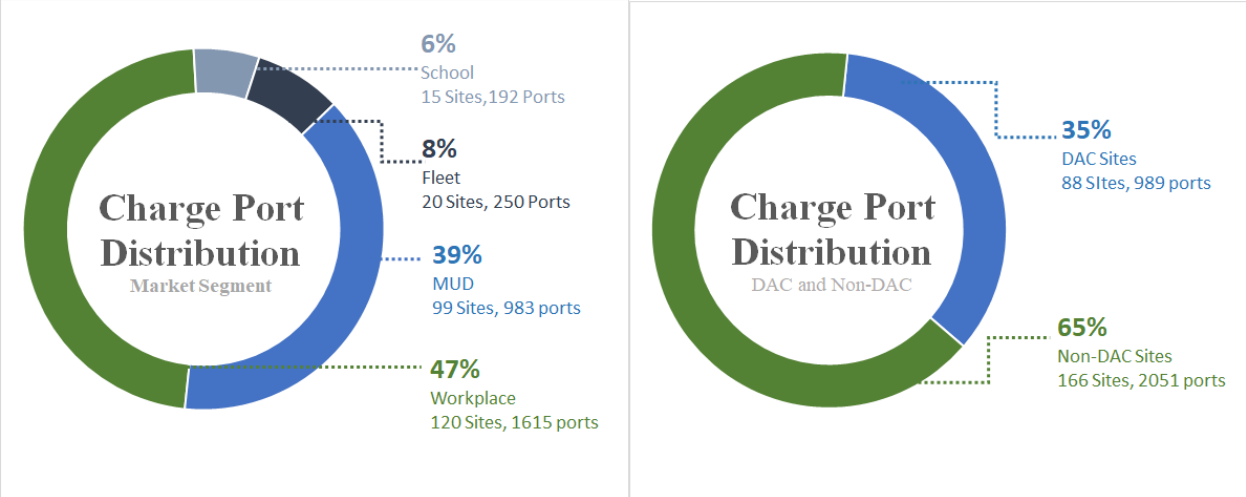


Figure 4: Contracted Site Distribution



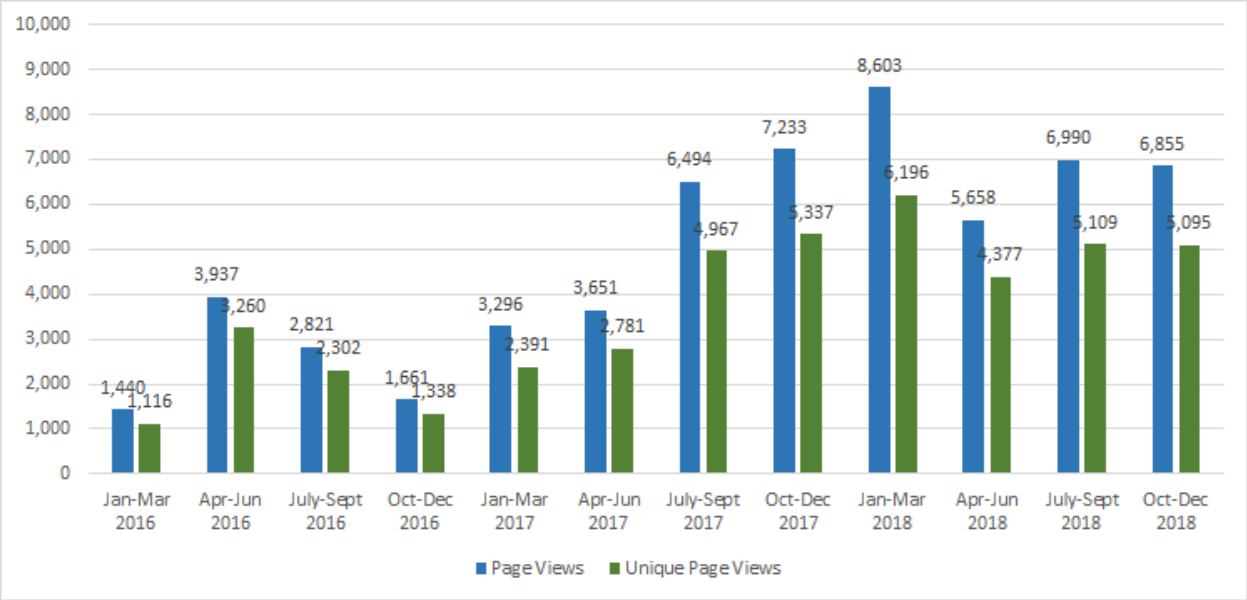
B. Power Your Drive Website Views

As part of the customer engagement efforts discussed in Section V of this report, the Customer Solutions Team directs customers to the PYD website to learn more about the Program and sign up for the interest list. Since the Program was fully subscribed in Q4 2019, the website has

been updated to no long accept applications. The website still receives a small number of views as it has overall information about the Program, but customers are no longer directed there.

The website metrics have been recorded from the initial launch of the website and will continue through the end of the Program. The metrics record both the page views and the unique page views as presented below. Page views represent each time a user visits a page, and the unique page views are an aggregated count of page views generated by the same user during their session on the website.

Figure 5: Page Views and Unique Page Views



C. Installations

As of February 28, 2019, SDG&E completed and energized installations at 247 sites, which includes 2,900 charging ports. There are 7 additional sites; one site is scheduled for construction and six sites are in construction.

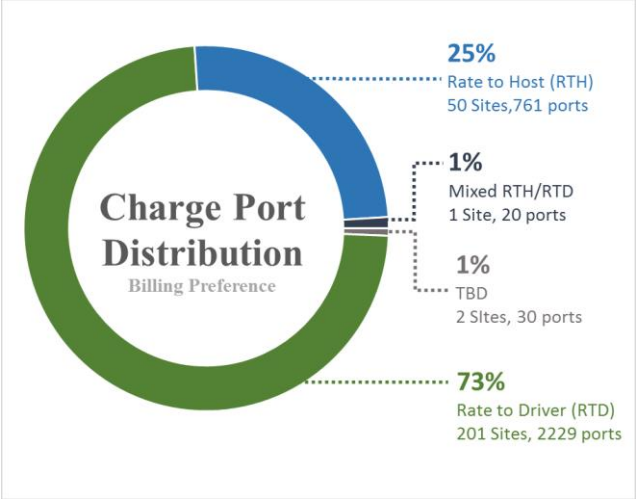
D. Billing Option Preferences

SDG&E tracks the billing options that customers may select as part of the Program. The billing option metric shows the billing option selected by the customer, broken down by workplace, multifamily, and disadvantaged communities. There are two billing options available within the Program: Rate-to-Driver, where the EV driver receives the (separately metered) rate directly, which is billed to the EV driver's residential bill/account; and, Rate-to-Host, where the site host receives the (separately metered) rate, which is billed to the site hosts' commercial bill/account. Selection of the Rate-to-Host option requires customer submission of a load management plan. As of February 28, 2019, out of the 45 contracted sites that have selected Rate-to-Host as their billing preference, 32 have selected a load management plan of powering down

or shutting off charging during high priced intervals, 7 sites have elected to use facility management of only allowing charging during certain time periods, and 5 sites have elected to send alert emails to drivers on high priced days.

The below chart shows all sites that have signed agreements, however, not all of these sites are energized, therefore, SDG&E does not have data on the billing plan preference for all customers signed up. Final confirmation of billing preference takes place just prior to energization.

Figure 6: Billing Preference for Sites with Signed Agreements

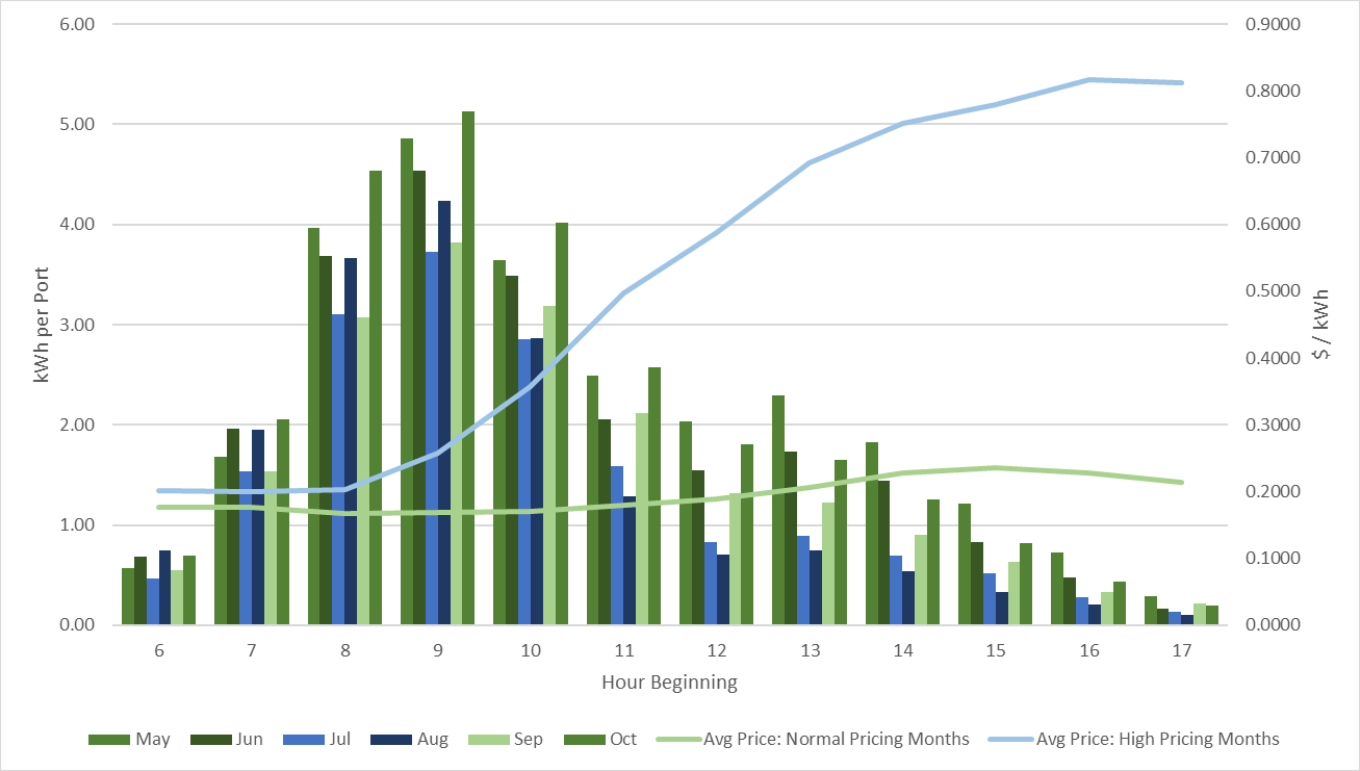


E. Timing Patterns of EV Charging

The charging patterns captured by the usage data are an important indicator of the overall effectiveness of the Program at encouraging EV charging during periods of lower grid utilization. The Program seeks to influence charging behavior through the implementation of an hourly rate which is calculated for each circuit based on projected demand and communicated to enrolled drivers daily for the following day. Since the rate is hourly, it is designed to be more flexible than typical off-peak and on-peak Time-of-Use rate schedules. The rate aims to incentivize, by lower pricing, charging at times that will optimize overall grid and circuit utilization, which will benefit all SDG&E ratepayers.

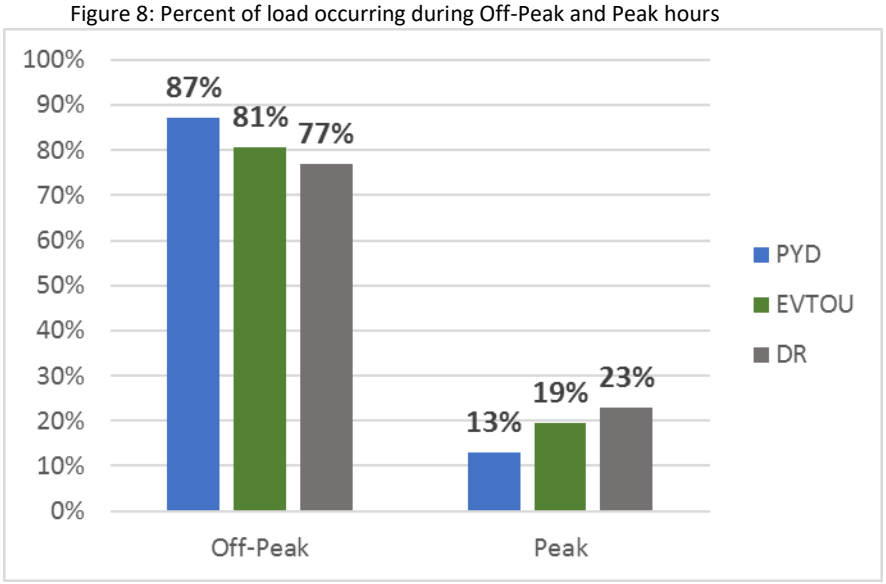
The chart below illustrates workplace usage and pricing from May 2018 until October 2018 from 6:00 a.m. to 5:00 p.m. (usage outside of these times are nominal at workplaces). Due to high temperatures in July 2018 and August 2018, high pricing events occurred more frequently during those months., The relative baseline of load expected in normal months can be seen by using the two months prior to and two months after the high pricing months. In hours beginning 11 through 14, there is a reduction in load during the higher price signal compared to what would be expected during those same hours in months with normal pricing.

Figure 7: Usage and Pricing at Workplaces from May through October for Hours beginning 6 through 17



An alternative method to display the timing patterns of EV charging is to compare the percent of EV load that occurs during SDG&E's peak pricing hours of 4:00 p.m. – 9:00 p.m. The chart below illustrates load shifting to off-peak hours. The VGI rate appears to be effective at incenting charging outside of SDG&E's peak. The numbers for the tiered rate ("DR") are for whole home usage of EV drivers and the EV TOU are for sub-metered EV usage.

Figure 8: Percent of load occurring during Off-Peak and Peak hours



F. Usage Rates

There are 247 sites that have been energized as of February 28, 2018. SDG&E began receiving usage data from the first site on June 29, 2017. A total of 1,243 EV drivers are enrolled in the Program. Usage volume for the reporting period comprised 75,844 unique charging sessions and 672,808 kWh delivered. Site utilization summarized by quartile is in Appendix A of this report.

G. Spend

The table below shows the costs of both the construction and full Program costs per site and per port. It also compares the estimates from the original filing to the actual costs of the Program. As described above in the Executive Summary, the actual costs of the Program exceeded both the filing assumptions and the project estimates post Decision.

Figure 8: Power Your Drive Costs by Site and Port

Average Estimated Costs	*Original Filing Assumptions (Direct)*	*Inception-to-date as of 2/28/2019 (Direct)*	*Inception-to-date as of 2/28/2019 (Fully Loaded)*
Construction Cost per Site *(Design, Construction, Materials)*	*$99K – $109K* *(10 ports/site up to 550 sites)*	*$185K* *($46m for 247 sites)*	*$194K* *($48m for 247 sites)*
Construction Cost per Port *(Design, Construction, Materials)*	*$9.9K - $10.9K* *($54M for up to 5,550 ports)*	*$15.7K* *($46M for 2,900 ports energized)*	*$16.5K* *($48M for 2,900 ports energized)*
Program Cost per Site	*$116K - $128K* *($64M up to 550 sites)*	*$238K* *($59M for 247 sites)*	*$285K* *($70M for 247 sites)*
Program Cost per Port	*$11.6K - $12.8K* *($64M for up to 5,500 ports)*	*$20.3K* *($59M for 2,900 ports contracted)*	*$24K* *($70M for 2,900 ports contracted)*

V. Supplemental Data Collection & Monitoring

This section presents the most recent data for the Power Your Drive supplemental metrics designed to aid in the evaluation of the overall Program performance. The data that is presented in this section is summarized in Appendix A of this report.

A. Programmatic Changes

SDG&E re-served the last Semi-Annual Report on February 12, 2019 with an update to the reported spend numbers. This update corrected how SDG&E reported Program costs in the Semi-Annual Report. SDG&E initially set up the accounting structure for this Program by assuming that the charger assets most appropriately belonged in FERC account (367) because the assets were anticipated to be on the customer side of the meter. This FERC account is defined as an electric distribution account that will be recovered in CPUC-jurisdictional rates. As the Program was launched, SDG&E realized that because the charger actually is the meter, it is on the company "side", not the customer side. Therefore, SDG&E moved the charger assets into an account that better fit the accounting definitions within the Code of Federal Regulations uniform system of accounts. Costs in this more appropriate FERC account (398) are recoverable through both FERC-jurisdictional and CPUC-jurisdictional rates. After this accounting change was made, the dollars associated with FERC-jurisdictional rates were inadvertently omitted from the Semi-Annual Report, such that they were not included in calculation of the total dollars spent on the Program. As soon as SDG&E identified this issue and identified the appropriate corrections, SDG&E addressed the issue and corrected it by submitting the update to the Semi-annual Report. The numbers in this report reflect the corrected total Program costs.

During the construction phase of the Program, the primary metric was energized ports; "energized" was defined as the on-site charging port and supporting infrastructure was installed with the location programmed and the charging port verified on the EVSP network. Now that the Program is transitioning to the operational phase, the focus has shifted to commissioning ports for customer use. The commissioning activities consist of three categories: SDG&E Site Set Up, EVSP Site Set Up, and Site Host and Driver Enrollment. The SDG&E Site Set Up involves connecting the charging ports, smart meter, and billing accounts associated with the site in SDG&E's systems of record. The EVSP then takes the meta data provided by SDG&E to create a driver and station management dashboard for that site and begins activating the charging ports for use. Finally, once SDG&E has validated that these actions have been completed by the EVSP, it sends the Site Host instructions on how to set up its PYD administrative account and begin driver enrollment. As of March 1, 2019, 2,350 ports have completed this commissioning process. SDG&E expects the remainder to be in service before the end of the year, barring any unforeseen circumstances. Some of the chargers are being installed as part of new construction efforts and the timing depends on the customer.

B. Fuel Cost Savings Estimate

This section provides estimates of fuel cost savings achieved by the displacement of gasoline in favor of electric charging at PYD sites, grouped by Rate-to-Driver and Rate-to-Host billing options. The estimation method is based on the total cost of the electricity usage at PYD sites from Program data, compared to the estimated total cost of fuel consumption by equivalent Internal Combustion Engines ("ICE") vehicles required to travel equivalent distance. The estimated savings also reflects current market conditions in the relative fuel efficiency of EVs compared to ICE vehicles and the average price of gasoline for the reporting period.

The data suggests that drivers at a Rate-to-Driver site save more per kWh because they are more price sensitive.

Figure 9: Estimated Fuel Cost Savings

	Rate-to-Host	**Rate-to-Driver**
Usage (kWh)	369,134	304,177
Average $/kWh	$0.23	$0.18
Total Cost	$84,734.62	$55,632.07
Approx Gas Equivalent (Gallons)[3]	44,834	36,945
Average $/gal[4]	$3.50	$3.50
Total Cost	$156,784.84	$129,195.28
Estimated Savings	$72,050.22	$73,563.21
Average Savings per kWh	$0.20	$0.24

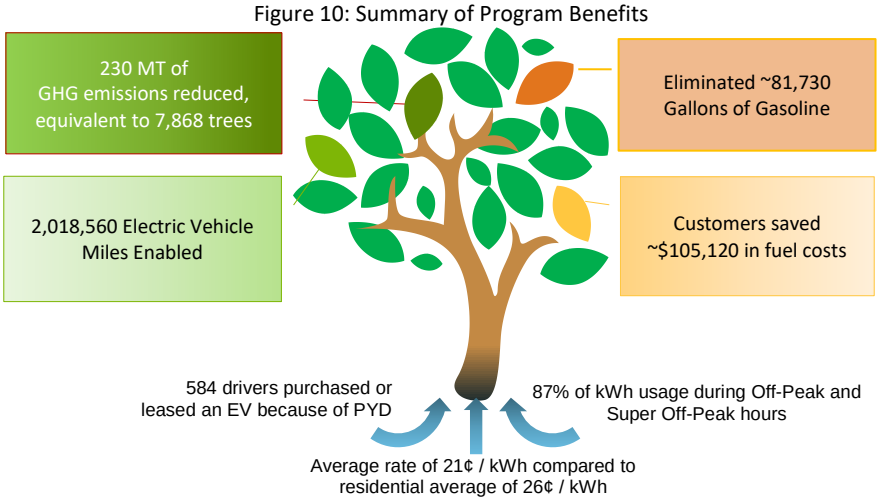
[3] Calculated using EPA average 24.7 MPG ICE vehicle and 3 mi/kWh EV

[4] San Diego 2018 average

C. Power Your Drive Data Trends

The following graphic shows the measurable trends and correlations that have been identified to date in the Program based on data collected as of February 28, 2019.

Figure 10: Summary of Program Benefits



To assess incremental EV adoption due to the presence of PYD ports, SDG&E calculated the number of drivers that have charged in the Program 90-days after the commissioning of a site. SDG&E assumes that drivers who charge prior to the 90-day window were likely already on the path to acquire an EV regardless of the presence of PYD ports. Applying this method, 584 of the 1,243 drivers purchased EVs due to the presence of PYD ports. This represents about 47% of all drivers registered and about one new EV added for every four ports installed under the Program.

Regarding emissions benefits, the Program has converted over 2 million miles[5] to zero emission miles. This represents about 230 metric tons of GHG emissions reduced[6], the equivalent to about 7,868 trees[7].

Alignment with Renewables

While SDG&E's overall renewable portfolio is above 44% renewable[8], PYD has a different load profile compared to SDG&E's overall load profile. PYD is 61% renewable when comparing energy procurement and generation to usage in 2018. This does not use the same calculations as the Power Content Label but provides a benchmarking of SDG&E's alignment with renewables. Workplace usage is 62% renewable and MUD usage is 51% renewable. This difference is primarily due to the timing of usage at workplaces aligning with the high volume of renewables available. Secondarily, the VGI rate has higher pricing during the non-renewable hours; since drivers are shifting their load away from these higher prices, they are aligning with more renewables.

[5] Calculated using EPA average 24.7 MPG ICE vehicle and 3 mi/kWh EV
[6] Chapter 8 – Prepared Direct Testimony of J.C. Martin: Air Quality Impacts and Cost Effectiveness
[7] EPA GHG Equivalencies Calculator
[8] SDG&E 2017 Power Content Label

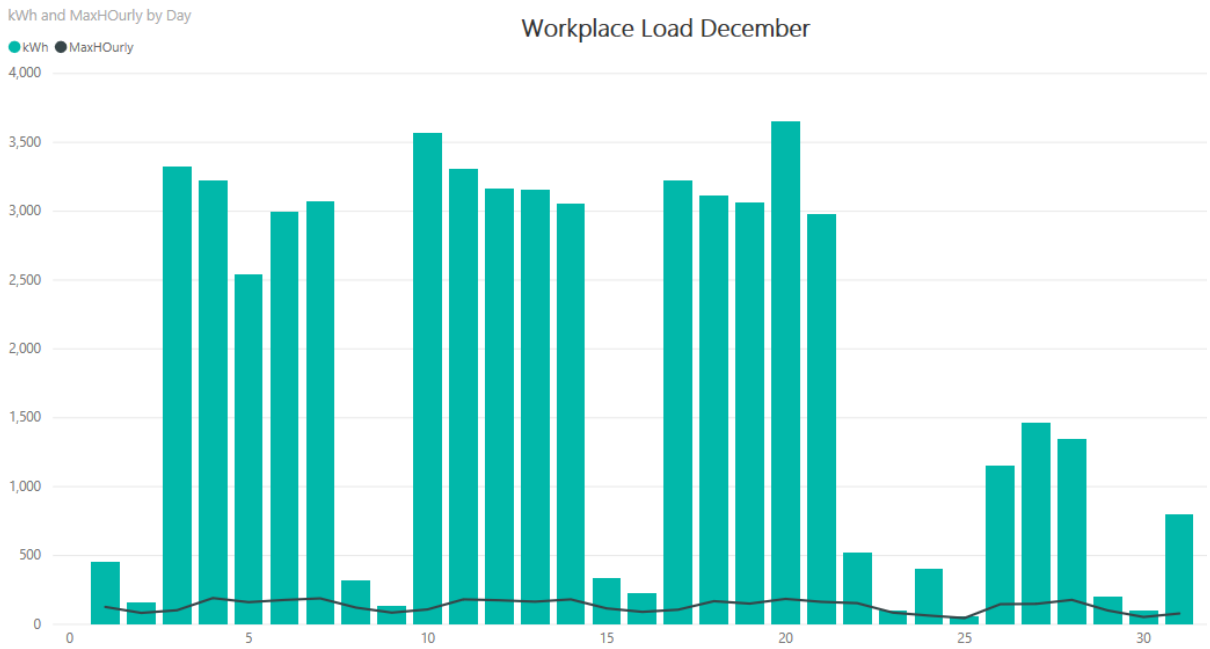
Monthly Load Patterns

The load patterns for workplaces and MUD sites have expectedly different shapes.

At workplaces, holidays and weekends show almost no load, with Mondays showing increased demand. There also is a slight increase in the highest hourly load on Fridays that does not result in a larger daily load. It may be that some drivers are willing to pay more and ensure they are fully charged before the weekend.

Figure 11: Workplace Load in September 2018

Figure 12: Workplace Load in December 2018



At MUD sites, load is relatively stable throughout the weeks with occasional spikes.

Figure 13: MUD Load in September 2018

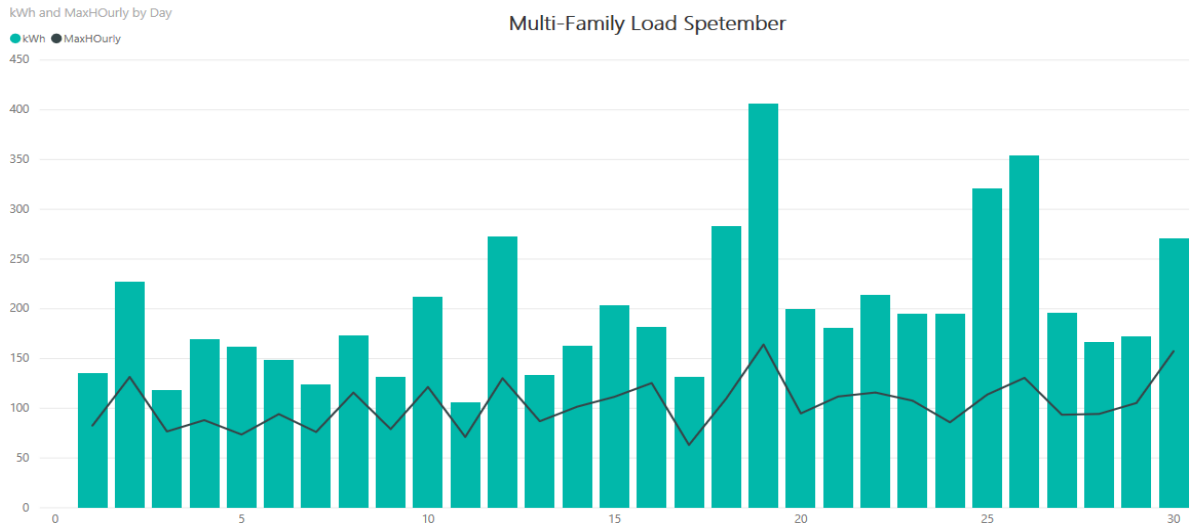
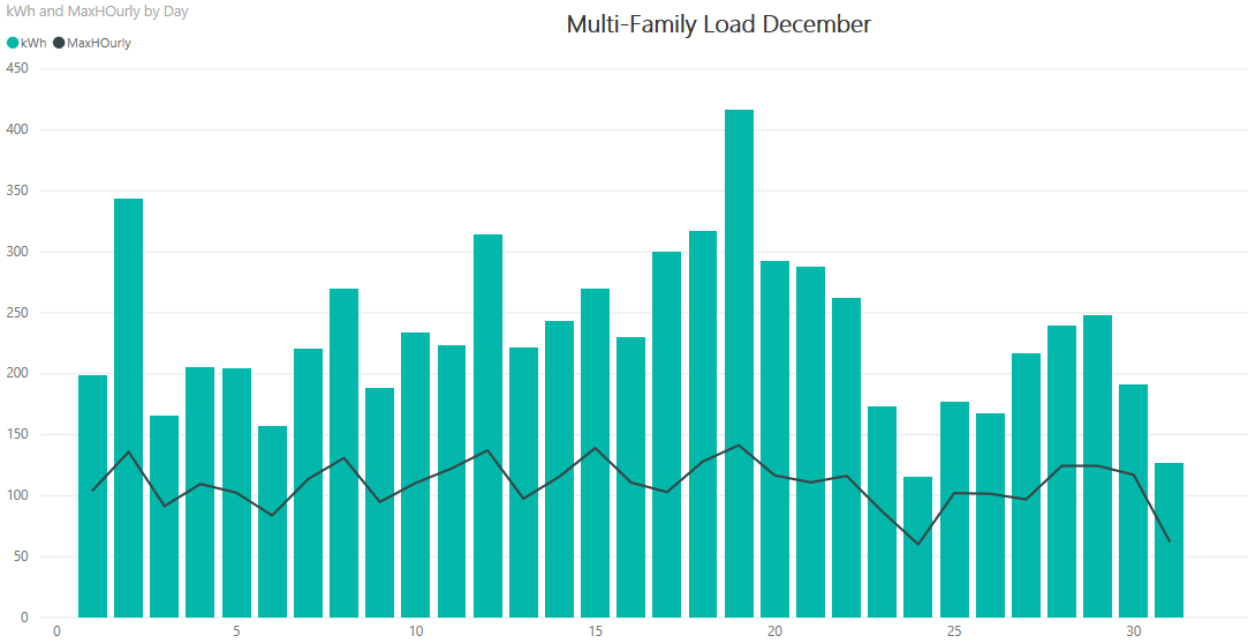


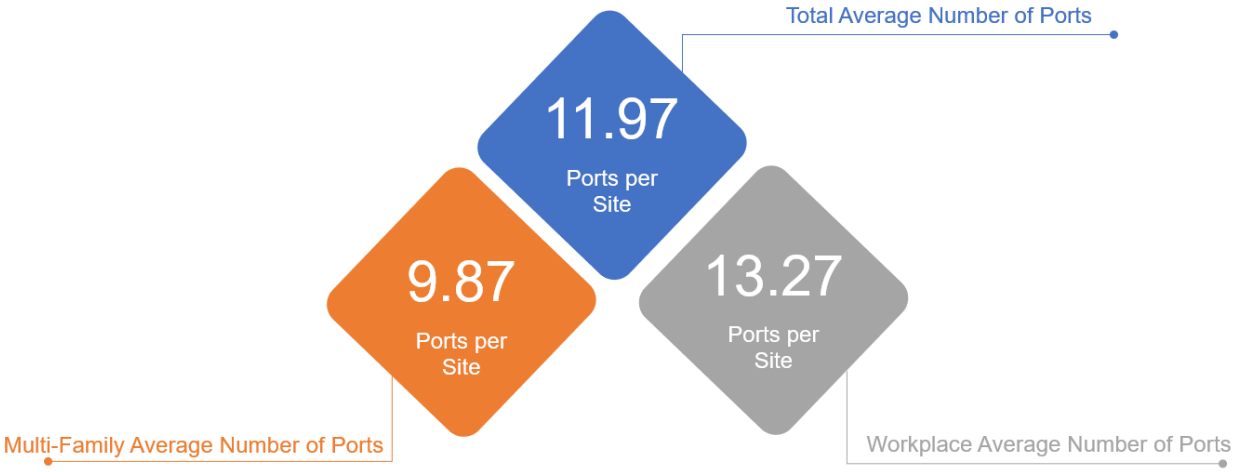
Figure 14: MUD Load in December 2018



Number of Charging Ports

When SDG&E filed the application for PYD, it targeted 10 charger ports per installation across all projects. However, the average number of charger ports was almost 12 ports per site (almost 10 ports for multifamily sites and 13 for workplace sites). This increase in the average number of ports per site allowed us to maximize Program benefits by working with customers to satisfy their needs. Many of the costs to deploy at a site are related to the characteristics of the site rather than the port count, and having more ports allows us to achieve a lower cost per port.

Figure 15: Average number of ports per site type



SDG&E identified early-on that attracting and qualifying MUD sites was challenging to meet the CPUC goal of 40% MUD sites and ports. However, SDG&E was able to come close to the MUD site target but were unable to reach the MUD port target.

VI. Summary & Conclusion

The Program is now transitioning from site deployment to maintenance and operation of the existing charging infrastructure. Additionally, SDG&E will focus on increasing utilization of the chargers.

SDG&E contracted with 254 sites, all utilizing the VGI rate, the first of its kind for a utility EV charging program. Customers are utilizing these chargers and data shows that they are charging at optimal times.

Program costs were higher than originally estimated. Some of the drivers include higher-than-anticipated costs of materials and engineering design. In addition, some costs were incurred due to the startup nature of a pilot program, such as IT costs and initial program ramp-up. Some costs were unforeseen due to changes in the program after the application was filed, such as the increase in price of the chargers. Throughout the Program, SDG&E continued to find efficiencies to reduce costs, however, overall the cost to build this Program was more than originally estimated.

Overall, the presence of these chargers is influencing EV adoption, as SDG&E considers that over 500 plug in electric vehicles have been purchased due to the Program. The hourly rate shows that customers are modifying charging behavior to incorporate pricing incentives. Additionally, there was more customer interest in the Program than SDG&E could accommodate. SDG&E continues to have customers reach out asking if they can be part of the Program.

Finally, SDG&E has been utilizing the knowledge it gained through the implementation of this pilot Program as it looks to future charging infrastructure programs.

Appendix A: Semi-Annual Report Summary

Reporting Requirement	Update	
1) Interest in EV site installations at MUDs and workplaces *[Interest List: Number of host sites by]*	MUD	458
	MUDs in DAC among sites in review[9]	331
	WP	310
	WP in DAC among sites in review[10]	159
2) Number of EV Site installations that were approved, or that are in the pipeline for deployment	Reviewed by SDG&E, but needed signed contracts	0
	Site Host Agreements Executed	254
	Installations in progress	7
3) Site selection criteria used in selecting the sites that will host the EV site installations *[within MUD, WP & DAC segments]*	» Interest list sign up via https://www.sdge.com/residential/electric-vehicles/power-your-drive/interest-list or ev@sdge.com » Customer submits application » Date of indicated interest (first-in-line-priority) » Current and expected volume of EV drivers » Number of installations desired » Type of installation (workplace, multifamily) » Disadvantaged community status » Customer's goals align with Power Your Drive criteria (i.e. no public charging, willingness to use VGI rate, etc.) » Nearby transformer available capacity » Distance between transformer and new service point » Site conditions related to construction feasibility and cost (i.e., trenching surface, EVSE mounting surface, condition of facility)	

[9] Total number of MUD sites in review: 107.
[10] Total number of WP in review: 166.

<table>
<tr><td></td><td colspan="3">» Americans with Disabilities Act (ADA) requirements
» If leasing, term and conditions of lease
» Land and property ownership
» Signature of site agreement required to proceed to engineering of site</td></tr>
<tr><td>4) Number of EV site installations</td><td colspan="3">247 (installed and energized)</td></tr>
<tr><td rowspan="6">5) Rate [billing] option that the site host have chosen [number of hosts by option, number of drivers]</td><td rowspan="3">Overall List of Sites (includes customers with unsigned Site Host Agreements)[11]</td><td>Rate-to-Driver</td><td>N/A</td></tr>
<tr><td>Rate-to-Host</td><td>N/A</td></tr>
<tr><td>Undecided</td><td>N/A</td></tr>
<tr><td rowspan="3">Sites Host Agreements Signed</td><td>Rate-to-Driver</td><td>196</td></tr>
<tr><td>Rate-to-Host</td><td>50</td></tr>
<tr><td>Undecided</td><td>3</td></tr>
<tr><td rowspan="4">6) How the Rate-to-Host option [load management plan] is being implemented by the site [number of host sites per load management plan type; categories of load management plan types will expand as they are reviewed and approved]</td><td>Powering Down/off</td><td colspan="2">32</td></tr>
<tr><td>Host Pricing</td><td colspan="2">0</td></tr>
<tr><td>Facility Mgmt</td><td colspan="2">7</td></tr>
<tr><td>Other (i.e. email to drivers)</td><td colspan="2">5</td></tr>
</table>

[11] Rate option is not determined until the latter part of the project.

7) Usage *[facility utilization]* rates at EV site installations and charging stations *[frequency per quartile of drivers / charging sessions volume and kWh sold per facility]*	Quartile	Volume		kWh Sold	
	25%	50 drivers / 480 sessions		2,773	
	50%	123 drivers / 4,357 sessions		25,178	
	75%	262 drivers / 13,989 sessions		79,774	
	100%	808 drivers / 57,018 sessions		565,084	
	Total[12]	1,243 drivers / 57,018 sessions		672,808	
8) Timing patterns of EV charging and the degree to which these times correlate to VGI rate categories *[kWh consumed by price range: min, average, max]* Times are based on EV-TOU rate	Time	kWh	Min $/kWh	Avg $/kWh	Max $/kWh
	Summer Peak	18,106.8	0.1402	0.4033	1.7338
	Summer Off-Peak	249,084.0	0.1313	0.3122	1.7017
	Summer Super-Off Peak	28,643.5	0.1289	0.1941	1.7338
	Winter Peak	25,948.3	0.1374	0.2612	0.9067
	Winter Off-Peak	316,084.1	0.1311	0.2542	0.8366
	Winter Super Off-Peak	34,941.7	0.1328	0.1948	0.9067
	Totals	672,808.4			
	Single Event	103,217.8			
	Dual Event	4,731.2			
9) The amount of the CPUC allocated budget for the Program spent during the last reporting	Spend since August 30, 2018	$29,733,658			
	Spend to Date as of February 28, 2019	$70,469,080			

[12] Some drivers may charge at multiple sites. This means that this single driver will show up in different sites and, therefore, will be double counted in how this quartile breaks out. The sessions and kWh are not duplicated.

period and the cumulative amount spent		
10) Observable trends or correlations between the number of EV site installations deployed compared to EV charging us and growth in the number of EVs	Discussion of observable trends included in the body of the report.	
Decision, Attachment 2, Appendix B – Combined with the Quarterly Report for the Semi-Annual Report (served to R.13-11-007 and A.14-01-014 service lists)		
A) Estimates of fuel savings through the use of the VGI facility, under both the VGI Rate-to-Driver and VGI Rate-to-Host pricing plans	Rate-to-Host	$73,563.21
	Rate-to-Driver	$71,604.28
B) Deployment of VGI Facilities *[number of]* within Disadvantaged Communities (DAC), including EV Car-sharing deployment	DAC - Workplace	58
	DAC - MUD	30
C) Status of Program	Embedded in this report	

Implementation to date	
D) Comparing the installations of non-utility EVSE to VGI EVSE	This is outside of the scope of the VGI pilot Program which is not responsible for tracking the installation of charging stations by others outside of the VGI pilot Program. Furthermore, there was no funding in Decision 16-01-045 to perform this type of analysis. There are public sources of this information regarding the deployment of public (not private) charging stations (e.g. PlugShare).
E) Surveys of customer and driver decisions to adopt PEVs	Will be provided when implemented
F) Rate of achievement of supplier diversity and workforce objectives	43.6%[13]
G) Description of any programmatic changes implemented by SDG&E prior to the date of the report	Programmatic changes are included in the body of the report (See Section VII B)

[13] As of 02/28/2019.

Appendix B: Program Advisory Council Company/Organizational Representation

Advanced Energy Economy
AeroVironment, Inc.
Black & Veatch
California Apartment Association
California Energy Commission
California Governor's Office of Business and Economic Development
California PEV
Collaborative Center for Sustainable Energy
ChargePoint
City of Chula Vista
Clean Fuel Connection
Collins Group, Inc.
CPUC Energy Division
CPUC Office of Ratepayer Advocates (ORA)
Electric Power Research Institute (EPRI)
Environmental Defense Fund
General Motors
Greenlining
Greenlots
HG Fenton Company
Honda Motor Co., Inc.
Hyundai-Kia America Technical Center, Inc. (HATCI)
IBEW Local 569
Intel Corporation
JRP Charge
Kn Grid
National Resources Defense Council (NRDC)
National Strategies
Plug In America
Powertree Services Inc.
Proterra
Recargo
RWE
San Diego Association of Governments (SANDAG)
San Diego Green Building Council
San Diego Unified School District
Shell
Siemens Digital Grid
Southern California Edison
Strategy Integration, LLC & The Energy Collaborative
The Utility Reform Network (TURN)
Utility Consumers' Action Network (UCAN)
Vote Solar

Appendix C: Circuit Taxonomy

Operational Definitions for Circuit Taxonomy

Circuit Attributes	**Count**
Total SDG&E Circuits	1,040
Circuits with Attributes	860
Circuits without Attributes	180*
**4kV circuits not included in distribution*	

Circuit Type	**Count**
Residential (R)	196
Mixed (M)	451
Commercial & Industrial (C&I)	213
Circuit Type is classified as Residential, Mixed, or Commercial & Industrial if 70% of the total consumption on that circuit is from that class.	

Summer Week Day Peak Hour	**Count**
11:00-14:59	203
15:00-19:59	185
18:00-18:59	168
20:00-21:59	298
**6 Circuits (0.7% of population) with summer weekday peak hours between 22:00 and 10:59 are not included.*	

Load Factor	**Count**
(H) High = > 46.0%	443
(L) Low = < 45.99%	417
(Average Hourly kWh / Peak kw)	

Solar Penetration	**Count**
(H) High = > 4.0%	426
(L) = < 3.99%	434
(Solar Capacity / Circuit Capacity)	

Note: circuit profile will remain unchanged throughout the 3-year sign-up period.

VGI Pilot - Circuit Sampling Distribution

As of 4/9/2019		Circuit Peaking Hours							
		Hours 11 thru 14[1]		Hours 15 thru 17		Hours 18 thru 19		Hours 20 thru 21	
Circuit Type	Solar Penetration	High Load Factor	Low Load Factor	High Load Factor	Low Load Factor	High Load Factor	Low Load Factor	High Load Factor	Low Load Factor
Residential Dominant	High Solar Penetration	1 **0** 0	2 **0** 0	3 **0** 0	4 **1** 1	5 **1** 0	6 **33** 15	7 **21** 6	8 **101** 27
	Low Solar Penetration	9 **0** 0	10 **2** 0	11 **0** 0	12 **2** 0	13 **1** 0	14 **5** 2	15 **10** 4	16 **18** 4
Res. and C&I Mixed	High Solar Penetration	17 **7** 3	18 **2** 0	19 **21** 8	20 **22** 10	21 **30** 12	22 **61** 10	23 **41** 10	24 **62** 21
	Low Solar Penetration	25 **45** 15	26 **19** 6	27 **56** 13	28 **14** 5	29 **18** 5	30 **13** 2	31 **38** 8	32 **2** 0
Commercial & Industrial Dominant	High Solar Penetration	33 **9** 3	34 **6** 2	35 **8** 1	36 **3** 0	37 **0** 0	38 **1** 0	39 **2** 1	40 **0** 0
	Low Solar Penetration	41 **57** 14	42 **56** 19	43 **44** 12	44 **14** 3	45 **3** 2	46 **2** 1	47 **3** 0	48 **0** 0

Distribution Cell #

SDG&E Circuit Count

In-Service Sites

[1] 6 Circuits (0.7% of sample set) with SWD_Pk_Hr between 22:00 and 10:59 are not included in this record count

Ratio of Represented Circuits to Full Population

- Equally Represented
- Under Represented
- Over Represented

Appendix H: Online EV Survey

Electric Vehicle Charging Survey

We are working with San Diego Gas & Electric® to explore the possibility of installing electric vehicle charging stations as part of their Power Your Drive program. We would like your input on current and future plans for driving and charging plug-in electric vehicles so we can establish an orderly and responsive approach to charging on the property.

Plug-in electric vehicles include all-electric cars with a range of up to 250 miles, and have no gasoline. Plug-in hybrids have an electric range up to 60 miles, before switching to gasoline and going an additional 300 miles.

Please submit completed this 3-minute survey as soon as possible.

Thank you for supporting our efforts to meet the current and future electric vehicle needs of our community. For more information about available electric cars, incentives and charging, visit www.sdge.com/EV or www.driveclean.ca.gov/pev.

* Required

1. Property or Business Name? *

Property name as listed in email.

Your answer

2. Site ID #? *
Site ID # as listed in email.

Your answer

3. Do you currently own a plug-in electric vehicle? *

- ○ Yes, please answer question 4.
- ○ No, please skip to question 5.

4. If yes to question 3, please specify vehicle year, make and model.

Your answer

5. If our property provided plug-in electric vehicle (PEV) charging, how likely are you to purchase or lease a plug-in car within the next one to three years? *

	1	2	3	4	5	
Not Likely	○	○	○	○	○	Very Likely

6. What type of PEV would you most likely lease or purchase? *

- ☐ All-electric (e.g., Nissan Leaf, Ford Focus EV, Fiat 500e, Chevy Spark, BMW i3, etc.)
- ☐ Plug-in Hybrid Electric Vehicle (cars with both a battery and gasoline, e.g. Chevy Volt, Prius Plug-in, C-Max Energi, etc.)
- ☐ Don't know

7. Approximately how many miles do you drive one-way between home and work? *

- ○ Less than 10 miles
- ○ 10-25
- ○ 26-50
- ○ More than 50 miles

Thank you for participating in this survey!

SUBMIT