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") FIFTH SEMI-ANNUAL REPORT (CORRECTED) OF SAN DIEGO GAS & ELECTRIC COMPANY (U902-E)

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February 12, 2019

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)

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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") Fifth Semi-Annual Report. This corrects the updated version of the Fifth Report previously served on November 8,

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[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.

2018. 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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February 12, 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) SEPTEMBER 2018

CORRECTED VERSION

SDG&E hereby corrects certain cost data originally provided in its Fifth Semi-Annual Report, dated October 22, 2018. The originally reported data for total spend incurred through August 31, 2018 omitted certain costs that are attributable to Power Your Drive.

The correct total spend figure as of August 31, 2018 is $40,735,422 and the correct total spend figure from the prior (Fourth) Semi-Annual Report, dated February 28, 2018 to the (Fifth) Semi-Annual Report dated August 31, 2018 is $20,777,078. The amount spent as of February 28, 2018 was $19,958,344.

Further, the estimated cost per energized port as of August 31, 2018 is $43,708. This cost per energized port is calculated by dividing total costs incurred ($40,735,422) over the total number of ports energized of (932).

This corrected cost data is included herein for reporting purposes. SDG&E shall not record any amounts to its VGI Balancing Account (VGIBA) that would exceed the start-up budget established in D.16-01-045, at Ordering Paragraph 3, or otherwise authorized by the California Public Utilities Commission.

The corrections made in this report are shown in redline and contained in Sections VI.G, Reporting Requirements – Spend (at pages 16-17) and in Appendix A (at page 26).

SDG&E is ramping its Power Your Drive program down and will provide more final program results and cost data in its Sixth Semi-Annual Report to be filed on April 22, 2019.

I. Introduction

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

Under the terms of Power Your Drive, SDG&E maintains ownership of the infrastructure to simplify the experience for customers who desire charging infrastructure 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. 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 all maintenance for the charging equipment.

Power Your Drive sites are either multifamily dwellings or workplaces. The Program has goals to reach at least 40% of installations in multifamily dwellings 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.

This is the fifth Semi-Annual Report that SDG&E has issued on the Program, as required by Decision D.16-01-045. For this report, construction and Site Agreement data is from the Program inception to August 31st, 2018 and usage data is from the Program inception to July 31st, 2018.

II. Executive Summary

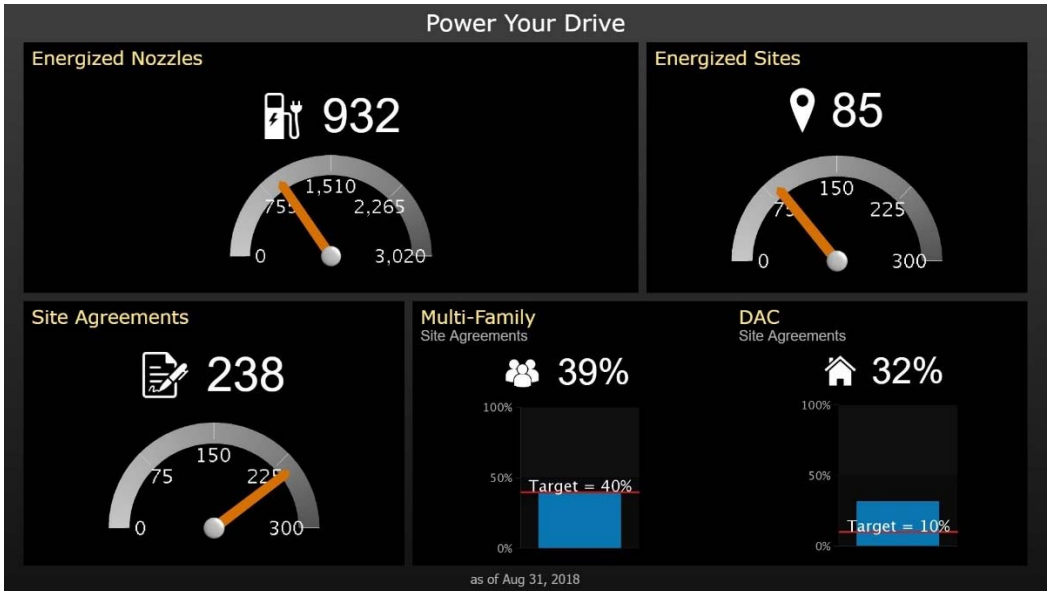
Power Your Drive was designed to align the utility, our customers, and state policy. Based on our initial analysis, SDG&E believes that it is achieving these targets. Not only is the Program showing strong customer interest in both the Program, and electric vehicles in general, but it is also demonstrating that customers are modifying their charging behavior. As of August 31st, 238 customers have signed Site Agreements[1], which will total more than 2,746 charging ports. A total of 1,149 customers have indicated interest in participating in Power Your Drive. Of the 238 customers who have signed Site Agreements, 32% are within disadvantaged communities-far exceeding SDG&E's 10% DAC target. Additionally, out of the 1,149 customers, 47% are located in multifamily dwellings, and 53% are located at workplaces. We

[1] "Site Agreement" means SDG&E has a signed easement or license agreement with the site host. For more information please refer to "Programmatic Changes" in section VII.B.

have also found that site hosts often request more chargers than originally planned as they proceed through the process and learn about drivers' needs at their properties. SDG&E will continue to focus on planning, engineering, permitting, construction and commissioning processes.

As mentioned in previous reports, Power Your Drive has also experienced challenges. These challenges include software customizations to accommodate an innovative hourly rate, EVSE vendor approvals, unanticipated significant 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 overcome these challenges, however resolving these challenges have increased program costs beyond SDG&E's estimates at the inception of the Program.

The following report details the Program progression, including how challenges were overcome. For this report, construction and Site Agreement data is as of August 31st, 2018 and usage data is as of July 31st, 2018.



III. Power Your Drive Process Overview

Customer Review Process

The customer review process is vital to selecting customers that fit the Program while maximizing efficiency of program operations. Lessons learned during program implementation have led to significant process changes since the last Semi-Annual Report (discussed in more depth in Section VII B). Power Your Drive uses the following three primary categories of criteria to determine which customers will be a good fit for the Program:

1. *Customer In-Take and Fit for Program*

» 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.)

2. *Site Feasibility for Cost Management*

» 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)

» Americans with Disabilities Act (ADA) requirements

3. *Site Agreement*[2] *(Easement, License Agreement, or Use and Occupancy Permit)*

» Land and property ownership

» If customer is leasing the site, term and conditions of lease

» Signature of Site Agreement required to proceed to engineering of site

Preliminary Engineering and Customer Approval

Upon receipt of an executed Site Agreement, SDG&E begins development of preliminary engineering, beginning with a site walk with the site host, resulting in a preliminary design and preliminary cost estimate. Preliminary designs show the proposed location of charging stations, meters, transformers, and other major equipment. The preliminary design is then sent to the customer for approval. Along with the preliminary design, the following documents are submitted to the customer for review and approval:

» Letter authorizing SDG&E or other designated third party to pursue agency permits on the owner's behalf.
» Billing preference: Rate-to-Host or Rate-to-Driver
» EVSP Selection

[2] Previously reported as "Contracted".

Final Engineering and Permitting

Final engineering commences upon written customer approval of the preliminary design. This work is completed by a third-party design vendor in coordination with a SDG&E designer. Once the design is completed and approved by SDG&E, final plans are submitted on behalf of the site host to the appropriate jurisdiction for building permits. All electrical work is reviewed, inspected, and approved by SDG&E. Furthermore, prior to construction, SDG&E performs environmental testing for asbestos and Title 22 metals.

With the volume of permits needed to execute Power Your Drive, a significant effort is invested to develop relationships with our local permitting agencies. Permitting is a critical piece of the schedule that is largely out of SDG&E's control and can sometimes represent more than half of a project's timeline. SDG&E's Regional Public Affairs group works with cities to better understand the permitting process and to see if there are streamlined processes the cities can adopt so that this part of the project does not slow down construction schedules.

Construction Awarding

The Power Your Drive Program developed and executed Master Service Agreements (MSAs) with 6 union staffed construction contractors after a competitively bid RFP. Power Your Drive sites have been constructed by each of the construction contractors awarded MSAs through a number of different contracting methods. Such methods include time and expenses per site, lump sum fixed bid per site, lump sum fixed bid per site bundles, and design-build contracts. As the Program further develops, many factors are considered before awarding contracts to construction contractors, such as the contractor's safety record, ability to perform the construction during the site host's availability for construction, site constructability constraints, and price. Employing a variety of construction contractors and contracting methods allows the Program to evaluate program efficiencies for future consideration.

Construction

The PYD construction process is comprised of three distinct phases of coordination.

Pre-Construction

Pre-construction encompasses all the coordinating efforts required as the project progresses from the design phase to the construction phase. The pre-construction meeting allows SDG&E, the site host, and the construction contractor an opportunity to clarify expectations prior to the start of active construction.

Active Construction

Active construction commences when the contractor mobilizes to the project site on the date mutually agreed to between the site host, SDG&E, and construction contractor and ends when the site has been energized. Site visits by SDG&E are conducted to ensure work is being built per plan, inspections are being scheduled with SDG&E and local agencies, and to ensure the contractor is adhering to the construction schedule. SDG&E also dispatches Field Safety Advisors to observe Power Your Drive construction contractors for compliance with SDG&E's safety requirements.

Construction Closeout Coordination

After a project has been energized and the construction contractor is approximately 90% complete with construction activities, a punch list of remaining items to completion is created. One hundred percent project completion occurs once all agreed-upon punch list items have been completed, all EVSEs are fully operational, and the contractor has demobilized from the site and the site is released to the customer.

Commissioning

The Commissioning process (1) verifies full functionality of the EVSEs (2) begins the coordination of information between the EVSP and SDG&E (3) and enables the hand-off to the customer for driver enrollment.

Commissioning begins during the construction closeout phase with the collection of metadata consisting of geographical and EVSE details. This data collection is a coordinated effort by SDG&E and the EVSP. Commissioning is performed by a certified contractor on site and involves physical testing of the EVSE for access control, establishment of relevant SDG&E and EVSP accounts, and site host specific programming, namely site host billing preference. SDG&E conducts the testing and account creation for each site and informs hosts when their site is ready to begin charging. SDG&E provides the site host with documentation to support a rollout to employees or tenants.

IV. Vehicle Service Provider Partner Relationship Development

As discussed in previous report, SDG&E began the qualification of multiple EV service providers (EVSP) to provide the Power Your Drive EV supply equipment (EVSE) networks and software services necessary to implement the Program's requirements. SDG&E believes the inclusion of multiple vendors into the Program fosters innovation and enhances the customer's experience by allowing customer choice of vendor, equipment, and service. The first step in the process was the issuance of a Request for Information (RFI) to industry subject matter experts. The RFI was necessary to help develop and refine the requirements and criteria in the Request for Proposal (RFP) that followed. Under the RFP process, vendor proposals were evaluated based on the ability to meet the technical and operational requirements of Power Your Drive.

Vendor RFP contracting and testing milestones:

RFI Issued: February 9, 2016
RFI Closed: March 8, 2016
RFI Vendor Debriefing: March 24, 2016

RFP Issued: May 31, 2016
Bidder's Conference: June 9, 2016
RFP Closed: July 12, 2016

Bid Evaluation Commenced:
July 12, 2016

Initial Scoring and Prioritization:
August 9, 2016

Vendor Demonstrations, Questions & Answers:
August 23 to September 13, 2016

Final Scoring and Prioritization:
September 13, 2016

Contract Negotiations Commenced:
September 14, 2016

1st and 2nd Vendors Start Solutions Acceptance Test:
February 2017
1st Vendor Approved: June 2017
2nd Vendor Approved: November 2017

As described in the Decision (e.g., Attachment 2, ¶ 19, p.10) the minimum requirements for qualified vendors include but are not limited to the following:

1. Ability to send the hourly rate on a day-ahead basis to the customer or driver
2. Allow the customer or driver to set charging needs
3. Collect the EV charging usage data, and then send the EV charging usage data to SDG&E for billing processing

All vendor bids are evaluated on the vendor's specific capabilities, past performance, qualifications, and experience. Part of the bid evaluation includes a preliminary meter test by an independent third party that does basic meter quality testing. Once vendors have passed this preliminary meter test and are contracted with SDG&E, they continue to the Solution Acceptance Testing (SAT), which is a comprehensive detailed test of the vendor's equipment and software interface of various data exchange scenarios with simulated and actual EV loads. SAT also includes testing of the three program goal requirements: the vendor's ability to receive and send the hourly rate on a day-ahead basis, collect the EV charging usage data, and the ability to send the data to SDG&E for billing processing.

- Power Your Drive qualification requirements for Electric Vehicle Service Providers (EVSP)

The Power Your Drive qualification requirements for EVSP consists of multiple phases. The first phase, the EVSP must provide information security penetration test results for the proposed EVSE and solution. In parallel the EVSE is goes through a series of qualification tests. This is followed by the SAT phase of the end to end process.

The qualification testing for each phase is summarized as follows

- Information Security Penetration test results:
    - EVSE physical security assessment
    - EVSE internal and external interface testing
    - EVSE internal storage and communication testing
    - EVSE firmware attack testing
    - Communication infrastructure testing
    - Web and mobile application services testing

- EVSE qualification testing:

    - EVSE meter report consumption in Watt-hours for 15 minutes interval
    - EVSE meter test for Full Load and Light Load (10% of Full Load capacity) for +/- 1.0% accuracy
    - EVSE meter communicate accurate consumption data locally and to EVSP backend system
    - EVSE meter power disturbances test
    - EVSE meter communicate current data and time
    - EVSP provide firmware version upgrades remotely through backend system

- EVSP solution acceptance testing:
    - Conduct interface and application testing
    - Conduct end to end testing

During the RFP phase, the EVSE accuracy requirements originally started with +/- 0.5% accuracy requirement (standard for utility grade smart meters), however, no EVSE could achieve that level of accuracy, so it was changed to +/- 1.0% during negotiations.

Some of the technical challenges with qualifying EVSPs include:

- EVSE meter accuracy not passing requirements
- EVSP struggled to communicate accurate consumption to the backend vs reported locally by the EVSE and/or standard meter
- EVSP struggled to display pricing on the charger, mobile application, or web portal accurately
- EVSP unable to pass DST time shift requirements
- EVSP split sessions across days to meet an SDG&E billing requirement
- EVSP struggled to connect to webservice security using two-way SSL
- Although SDG&E used industry integration standards familiar with EVSP, it took EVSP time to meet SDG&E needs
- EVSP had to adjust to SDG&E customer enrollments model

- Solution Acceptance Testing Challenges

Successfully passing all aspects of the SAT process has been challenging for vendors. Since the previous reporting period, SDG&E has not been able to add a new vendor. Two vendors– ChargePoint and Greenlots – have passed all aspects of SAT. A third vendor made multiple attempts to pass the SAT but was not successful. Because the Program is in its final phase, SDG&E will no longer attempt to qualify new vendors for Program participation.

Test Name	Description
Meter Certification Testing	Full Battery of Safety and Accuracy Testing performed by Meter Operations on First Article EVSE as described in Agreement Exhibit D: Meter Test Plan Document
Solutions Acceptance Test (SAT)	Test and Validation of EVSP Solution: Apps, Portals, Enrollment, Price, and Consumption using mix of mocked up and real data in Test Environment
End-to-End	Test of EVSP and SDG&E system processes successively using real data in Test Environment
End-to-End (Alpha Test)	Test of EVSP and SDG&E system processes successively using real data
Production Validation	Test of EVSP and SDG&E system processes at Customer Site using real drivers and live data

V. Customer Engagement

Maintaining an excellent Power Your Drive customer experience is vital during all touch points of customer engagement. SDG&E has received strong and positive responses from both customers and community stakeholders regarding the Program. This is demonstrated by the number of customers who have signed up on the Program interest list, as well as requests from community partners to learn more about Power Your Drive. An integrated approach to the Program's communication efforts helps leverage the work SDG&E is already doing throughout the region and helps ensure customers and stakeholders are informed about the EV charging opportunities and benefits Power Your Drive offers.

A. Employee Involvement

SDG&E believes that its best outreach is through its employee base. In 2015, SDG&E launched its "Race to 500" shareholder incentive program with the goal of having 500 employees driving electric cars by 2020. In support of local and statewide goals to reduce transportation-related air pollution and greenhouse gas emissions, SDG&E finished the "Race to 500" two years ahead of schedule – reaching the target of 500 employees transitioning to driving electric

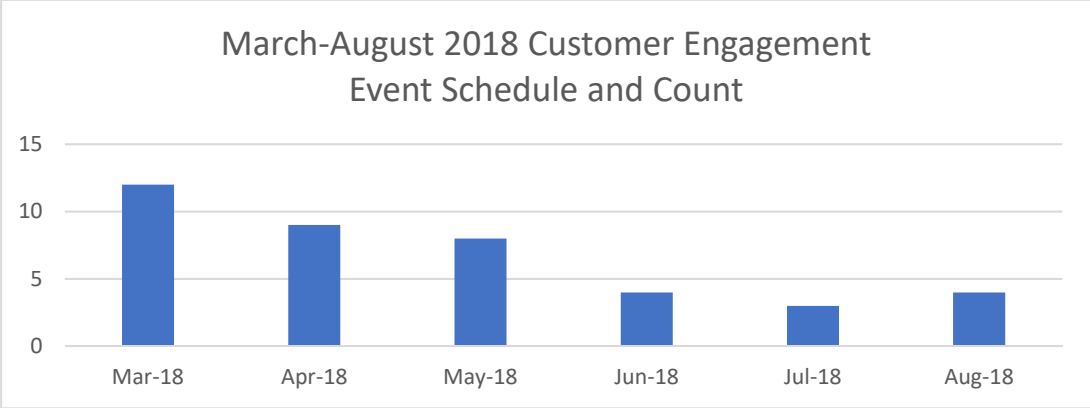
vehicles in 2018, instead of 2020. As of August 31, 2018, SDG&E has 505 employees driving EVs, and has installed more than 253 grid-integrated EV charging stations at 21 company work locations.

By implementing an employee education and outreach program to inform all SDG&E departments about electric transportation and Power Your Drive, SDG&E employees have become important clean transportation ambassadors for the region.

During the first quarter of 2018, the Clean Transportation team embarked on a mission to engage employees working in the field, who have regular interaction with the SDG&E customer base. As part of this effort, representatives from Clean Transportation visited 11 SDG&E satellite offices to educate the employees on the Power Your Drive Program and other clean transportation initiatives. An employee referral competition was added to the roadshows to incentivize employees to participate and provide leads on possible Power Your Drive sites.

B. Community Outreach Events

SDG&E has hosted, participated in, or facilitated over 40 outreach events between March and August 2018. SDG&E's partnership with local community organizations and businesses brings both awareness and education of Power Your Drive by highlighting environmental and community benefits of clean energy use. Over the past six months, the Clean Transportation team was involved in a variety of event types, including Town Halls, Conferences, Earth Day and Fairs, Customer Appreciation Events, EV Day, and Media Press Events.



SDG&E has hosted, participated in, and facilitated over 40 outreach events between March and August 2018

- Earth Day Festivities

April 2018 marked the 48th anniversary of Earth Day. While Earth Day officially took place on April 22, SDG&E employees participated and supported local earth fairs throughout the entire month. In particular, SDG&E's Clean Transportation team participated in five Earth Day

events all around the SDG&E service territory, with a goal to educate the public about the benefits of driving electric and to provide information about the benefits of Power Your Drive.

On Saturday, April 7, SDG&E participated in the South Bay Earth Day event, which took place in Chula Vista Marina at Bayside Park. SDG&E's Clean Transportation team was there to answer questions about EVs, hand out collateral related to Power Your Drive, and showcase four low and zero-emissions fleet vehicles.

- Grand Avenue Festival

On Sunday, May 20, 2018, SDG&E took part in the Grand Avenue Festival, sponsored by the Escondido Chamber of Commerce and the Downtown Business Association. The Power Your Drive display was in the center of all the action. SDG&E's electric vehicle experts answered questions and provided information about Power Your Drive, local, state and federal EV incentives, charging equipment, and other local projects to advance zero-emission transportation.

- Chula Vista Power Your Drive Press Conference

On March 28, 2018, leaders from the City of Chula Vista and SDG&E unveiled a fleet of brand new electric vehicles (EV) and an array of EV charging stations at City Hall. As part of its Power Your Drive Program, SDG&E's clean transportation team has been working with the City of Chula Vista to install charging stations at its City Hall, Public Works Department and Police Department. A total of 375 chargers will be installed at city facilities. To date, 123 chargers have been installed and energized.

- Electric Vehicle Day

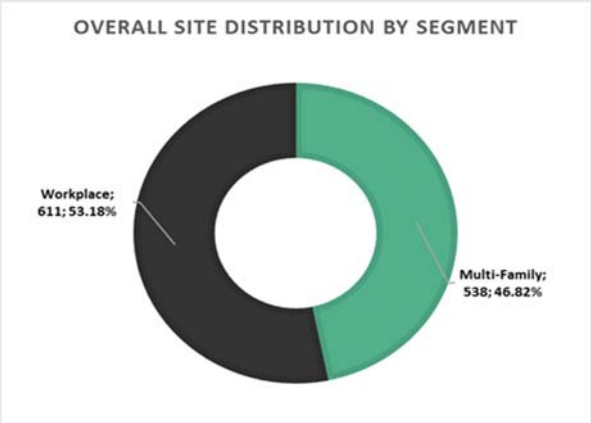
On September 15th, 2018, SDG&E conducted its annual EV Day to support the 6th annual National Drive Electric Week. The SDG&E EV Day was the largest attended EV Day event in the nation with the largest number of registered ride and drives.

VI. 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

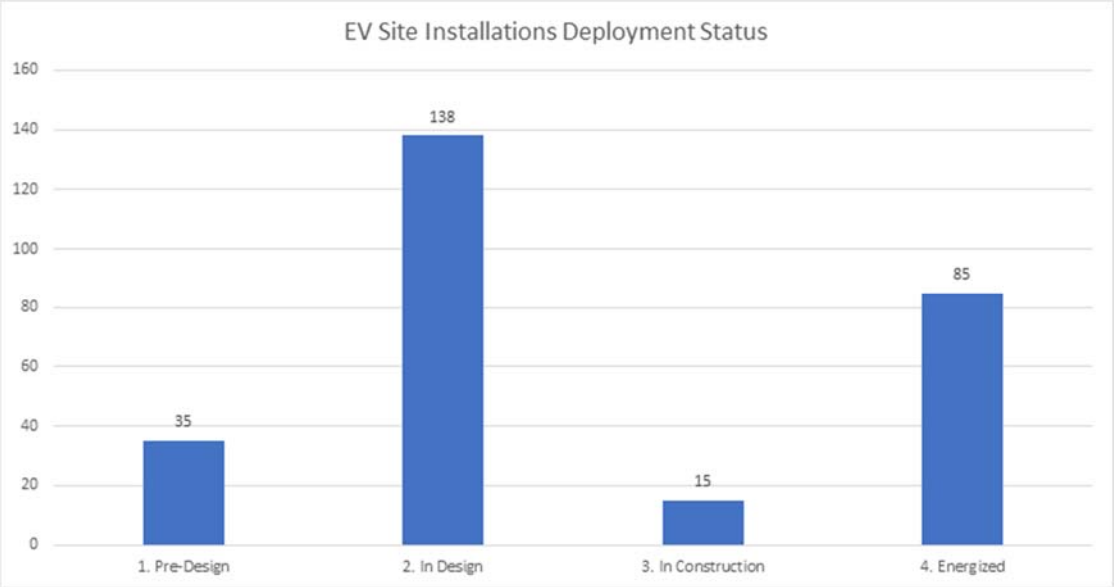
The Program received significant customer interest. As of August 31st, 2018, 1,149 customers indicated interest in participating in the Program. Of this group, 538 (46.82%) are multifamily sites and 611 (53.18%) are workplace locations.



B. Installations

As of August 31st, 2018, SDG&E has completed and energized installations at 85 sites, which includes 932 charging stations. At that time, there were 273 sites that had progressed to various stages beyond initial interest (including the 85 energized sites). Of these 273 sites, 35 sites were reviewed by SDG&E, but needed signed contracts; 138 sites were in design; and 15 sites were midway through installation. The status of the sites in deployment is illustrated in the EV Site Installations Deployment Status Chart below.

Installations are defined as the number of sites that are in progress toward facility deployment. The sites represented have advanced beyond initial customer interest and are in various stages of the Program.

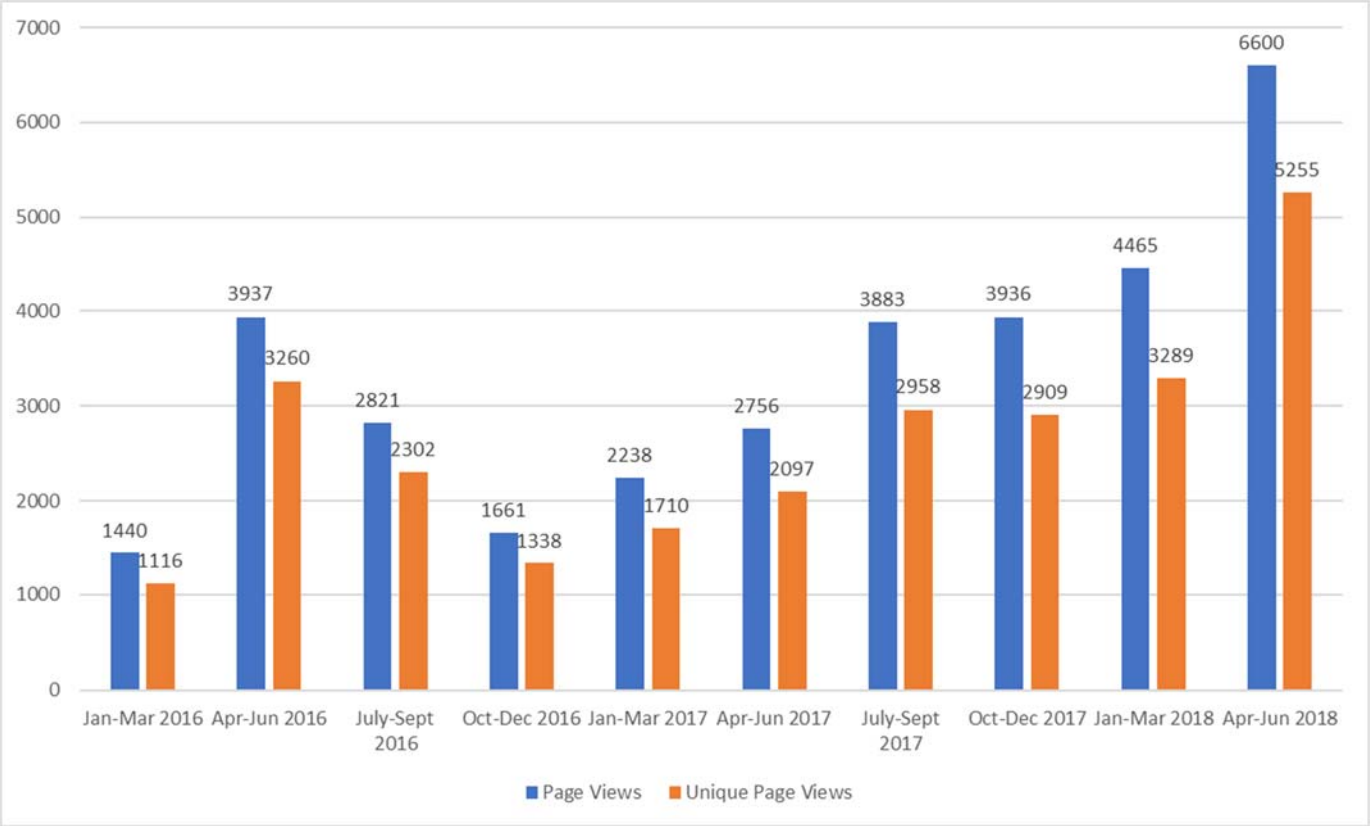


EV Site Installations Deployment Status Chart

C. Power Your Drive Website Views

As part of the customer engagement efforts discussed in Section V of this report, customers are directed to the Power Your Drive website to learn more about the Program, sign up for the Interest List, and submit the application. The website also outlines the Program's easy to follow steps both in writing and in an upbeat video for customers to get familiar and understand the overall program process.

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.



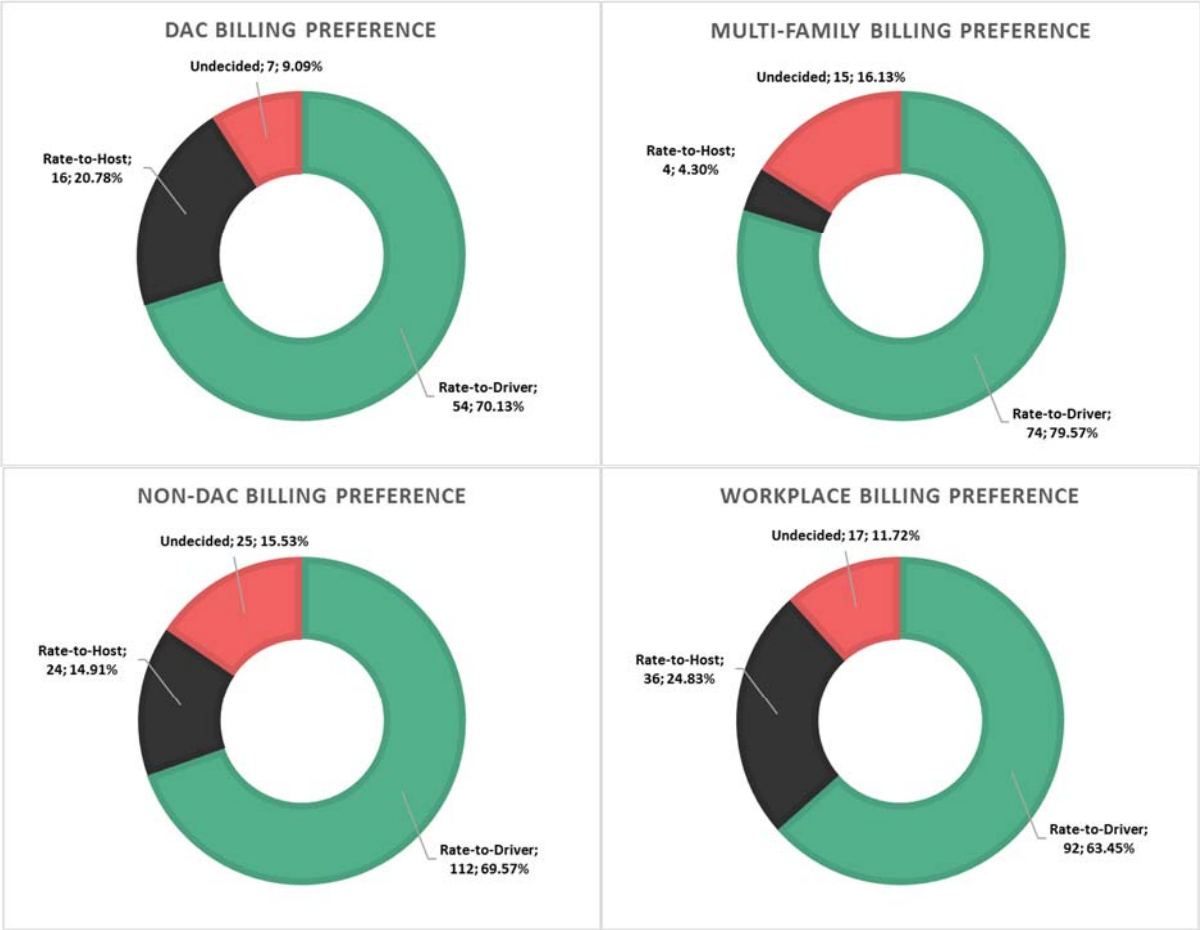
Power Your Drive Page Views and the Unique Page Views

D. Billing Option Preferences

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 Power Your Drive: rate-to-driver, where the EV driver receives the (separately metered) rate directly and is billed to the EV driver's residential bill/account; and, rate-to-host, where the site host receives the (separately metered) rate and is billed to the hosts commercial bill/account. Selection of the rate-to-host option requires customer submission of a load management plan. As of August 31st, 2018, out of the 17 energized sites that have selected Rate to Host as their billing preference, 15 have selected a load management plan of powering down or shut off charging during high priced intervals, with 2 sites electing 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.

Sites with Signed Agreements (Not all are Energized Yet)

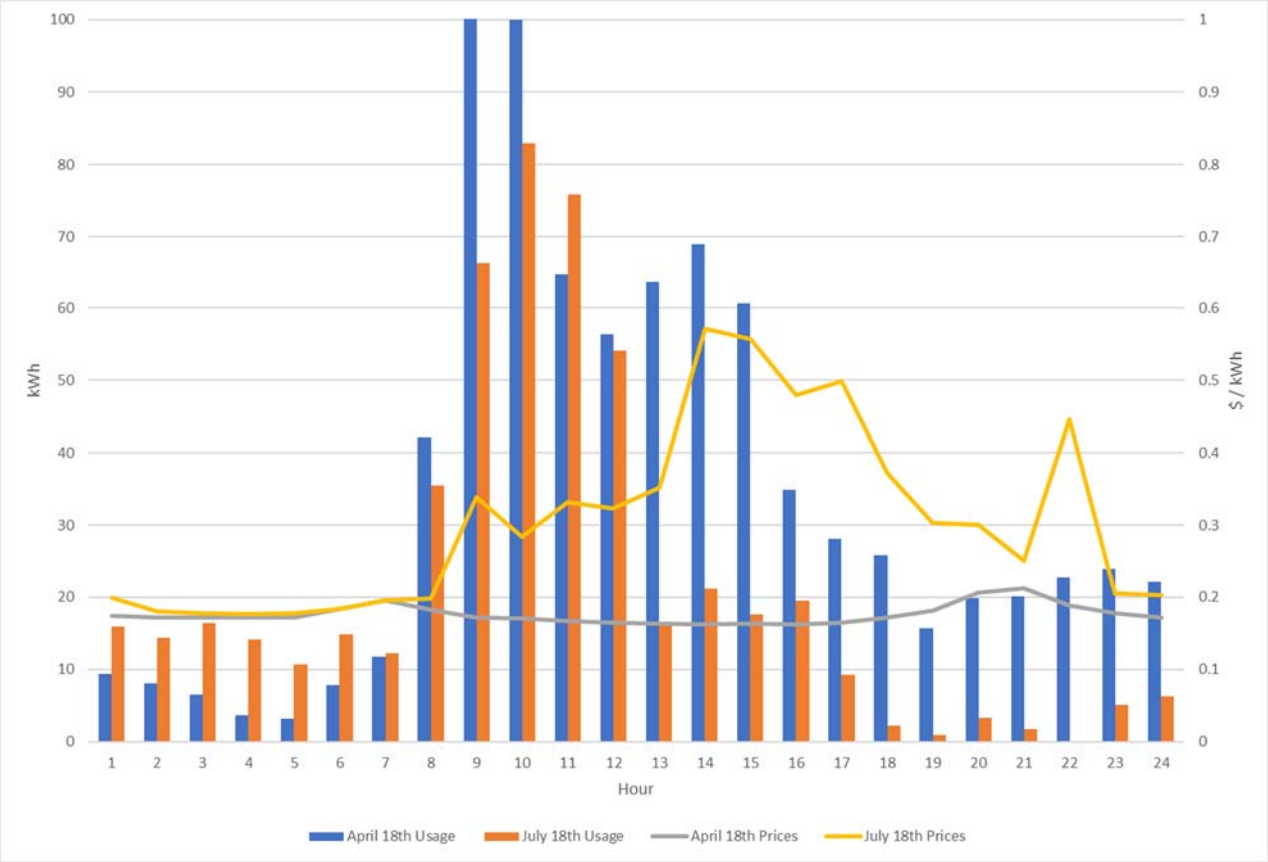


E. Timing Patterns of EV Charging

The charging patterns captured by the usage data are an important indicator of the overall effectiveness of Power Your Drive to encourage EV charging during periods of lower grid utilization. The Program seeks to influence charging behavior through the implementation of a program specific 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 to communicate overall grid utilization to EV drivers. The rate aims to incentivize charging at times that will optimize overall grid and circuit utilization which will benefit all SDG&E ratepayers.

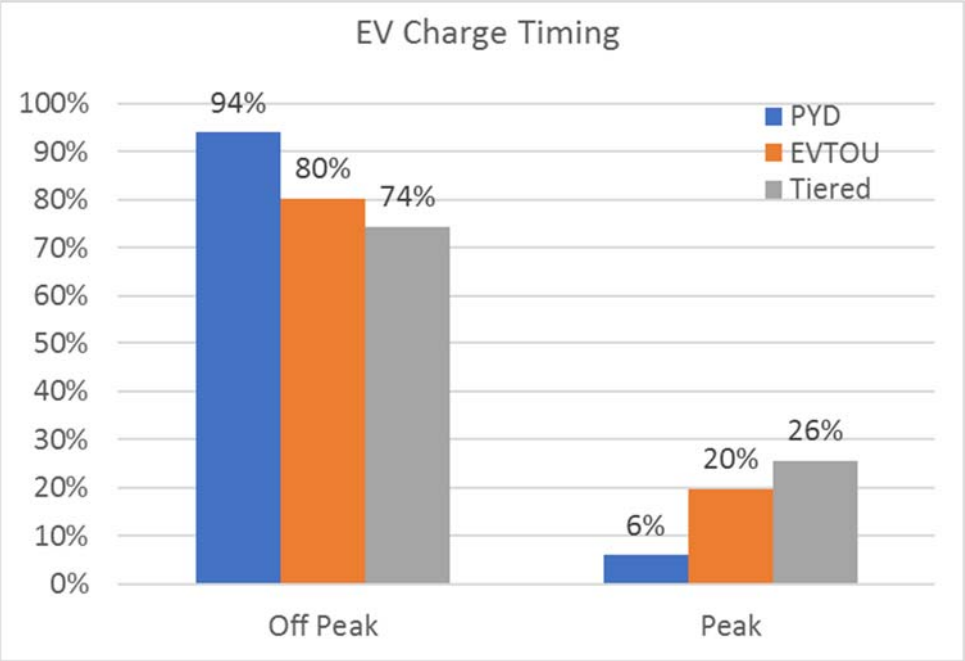
The chart below illustrates usage and pricing on two days: April 18th that had normal pricing and July 18th that had high pricing. On the high-priced day, usage in hours 13 through 23 (or 1:00 p.m. – 11:00 p.m.) drops off due to the higher pricing. Additionally, there is increase in

usage earlier in the day, before hours 6 and 7 (or 6:00 a.m. – 7:00 a.m.), that may otherwise, not have occurred. These charging patterns are indicative of day ahead pricing impacts on customer's charging behavior.



Usage and pricing on April 18th and July 18th

The chart below illustrates load shifting to off-peak hours. The Power Your Drive Vehicle Grid Integrated (VGI) rate appears to be effective at incenting charging outside of SDG&E's peak (4:00 p.m. – 9:00 p.m.). The numbers for the Tiered Rate are for whole home usage of EV drivers and the EV TOU are for sub-metered EV usage.



F. Usage Rates

The usage rates reported in this section are designed to reflect the growth in use of the Power Your Drive facility (kWh usage and number of EV drivers) in total, by workplace and multifamily locations measured for the Program.

Construction has been completed and charging stations have been fully deployed for use at 60 sites as of July 31st, the current reporting period.[3] SDG&E began receiving usage data from the first site on June 29th, 2017 with the usage in this report as of July 31st, 2018. A total of 654 EV drivers are currently enrolled in the Program. Usage volume for the reporting period comprised 24,534 unique charging sessions and 200,423 kWh sold. Facility utilization summarized by quartile is in Appendix A of this report.

G. Spend

As of August 3130, 2018, Power Your Drive has spent a total of $40,735,422~~$31,784,566 of the CPUC allocated budget~~. The total spent since the from the last (Fourth) Power Your Drive report dated February 28, 2018 is $20,777,078. The amount spent as of February 28, 2018 was $19,958,344~~$16,054,566 of this budget~~. Some program costs such as project management, the vendor qualification process, IT development, permitting, and complying with 2016 ADA requirements are trending higher than forecasted (at this point in the Program costs of the ADA

[3] SDG&E consumption data referenced in this report is as of July 31st. Unless otherwise stated, all other data is as of August 31st.

requirements are based on a preliminary order of magnitude estimate of $4M and $7M). SDG&E is evaluating areas of opportunity for increased efficiencies and cost savings.

Per the request of CPUC Staff, SDG&E has estimated the cost per port of energized ports as of August 31st, 2018 to be $43,708~~$34,103.61~~. This cost per port is calculated by dividing total costs incurred ($40,735,422~~$31,784,566~~) over total number of ports energized of (932). SDG&E believes that these costs do not accurately represent what the final cost per port will be, as this cost includes fixed costs needed to begin the program. As more ports are energized, the cost per port will be reduced due to these fixed costs being spread over more ports.

VII. 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. Evaluation

The Research Plan proposed by SDG&E to evaluate Power Your Drive is on track to be completed after the Program has been fully implemented and usage data has been gathered. The Research Plan will better show the effects of grid-integrated EV charging, which SDG&E continues to develop as a cost-effectiveness model. As EV charging data and cost information become available through the Program deployment and operations, observed results will replace hypothesized assumptions used to evaluate the Program.

B. Programmatic Changes

The following programmatic changes have been implemented by SDG&E following the submittal of the February 28, 2018 report:

- Significant program responsibilities were transitioned from third party resources to internal SDG&E staff. Areas of responsibility transferred to SDG&E internal resources include program management and support functions, site host coordination, civil and electrical design review, and construction management. This refinement has streamlined the Program execution process and decreased individual project durations resulting in an optimized project lifecycle from Site Agreement through customer enrollment. These changes led to cost savings for the Program.

- The definition of a “Contracted” site as previously reported has been replaced with “Site Agreement”, which is defined as an Easement or License Agreement with the Site Host. Prior to these changes, a “Contracted” site meant a site where the online participation agreement had been signed, but the property document (“Site Agreement”) may or may not have been signed. SDG&E revised the definition of “Contracted” site to “Site Agreement” because it learned that the design process should not be started until the Site

Host had signed the "Site Agreement."

- SDG&E also developed and began offering to Site Hosts a License Agreement in addition to an Easement, after noticing that explaining and negotiating, and ultimately acquiring, easements, was time costly and challenging. Allowing Site Hosts to choose a license, enables them to more easily decide to be part of the program.

C. Fuel Cost Savings Estimate

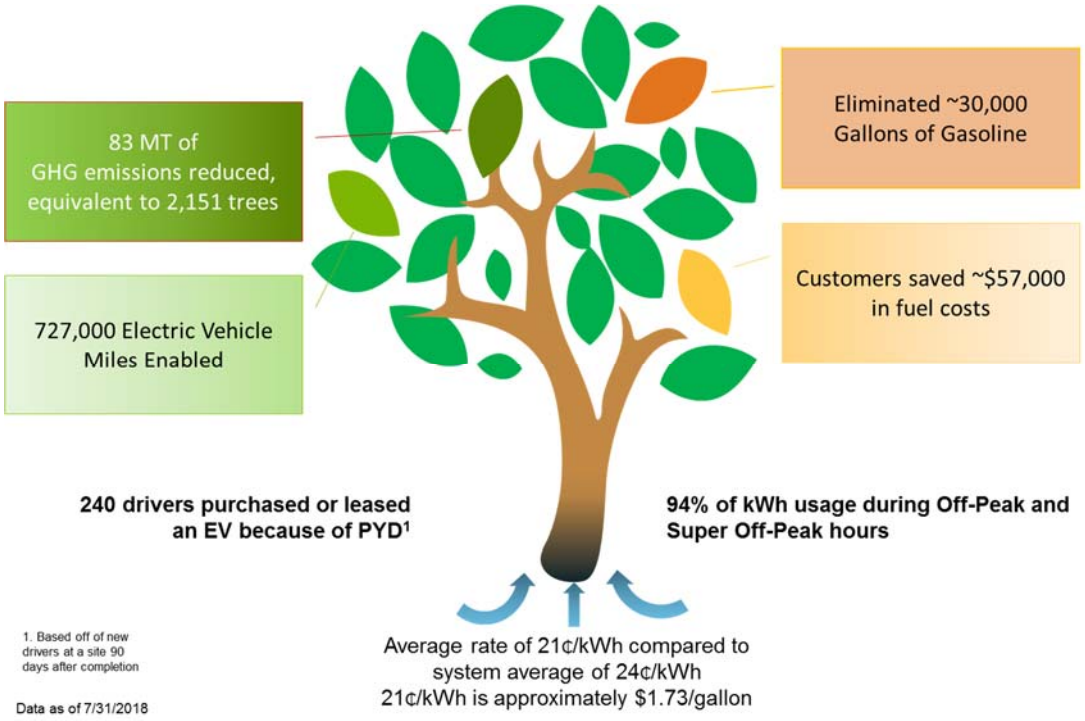
This section provides estimates of fuel cost savings achieved by the displacement of gasoline in favor of electric charging at Power Your Drive facilities, grouped by rate-to-driver and rate-to-host billing options. The estimation method is based on the total cost of the electricity usage at Power Your Drive facilities 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 reflect 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.

Estimated Fuel Cost Savings	**Rate to Host**	**Rate to driver**
Usage (kWh)	142,041	100,509
Average $/kWh	$0.221	$0.184
Total Cost	$31,456.45	$18,546.11
Gas Equivalent (Gallons)	17,252	12,206
Average $/gal	$3.622	$3.622
Total Cost	$62,486.45	$44,215.91
Estimated Savings	$31,030.00	$25,669.80
Average Savings per kWh	$0.209	$0.237

D. Power Your Drive Data Trends

The following graphic shows the measurable trends and correlations that have been identified to date in Power Your Drive based on data collected as of July 31, 2018.



To assess incremental EV adoption due to the presence of Power Your Drive EV charging facilities, we calculated the number of drivers that registered their vehicle ninety days after the commissioning of a site. We assume that drivers prior to the 90-day window were likely already on the path to acquire an EV regardless of Power Your Drive facilities. As such, we are counting only those drivers as incremental if they registered their vehicle ninety days after site commissioning. Applying this method, 240 of the 654 drivers purchased EVs due to the presence of the Power Your Drive EV Charging facilities. This represents about 36% of all drivers registered and about one new EV added for every four ports installed under the Program.

With regards to emissions trends, SDG&E's pilot has converted over 727,000 miles to zero emission miles. This represents about 83 metric tons of GHG emissions reduced, the equivalent to about 2,151 trees.

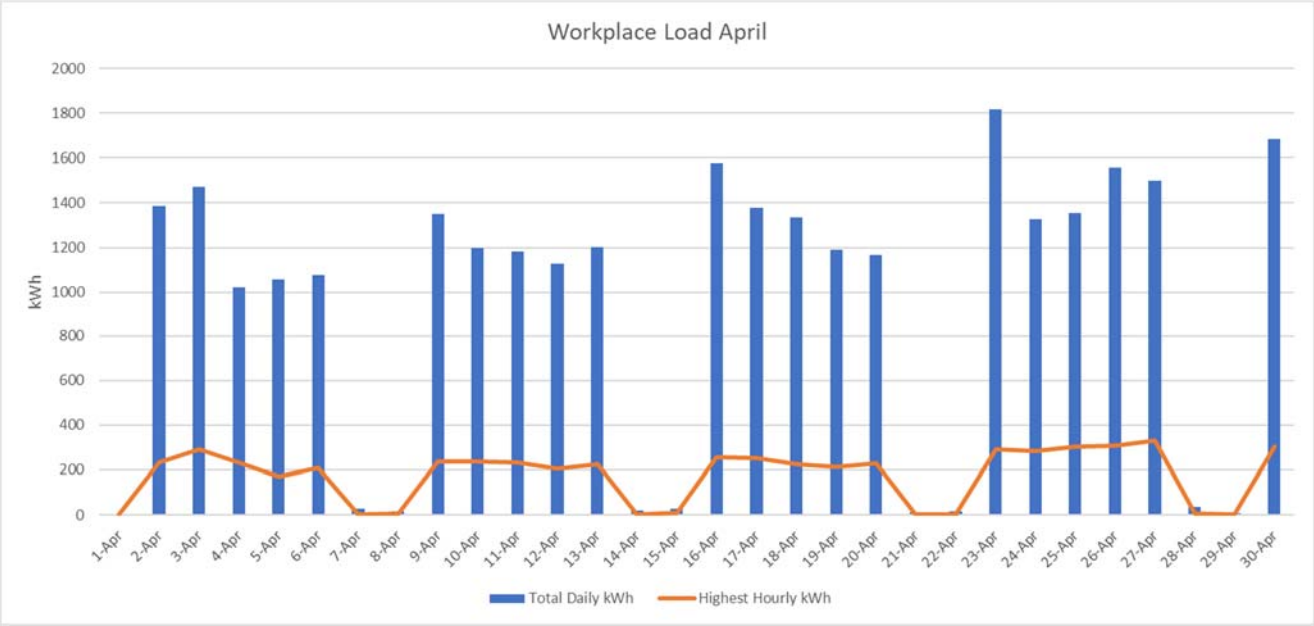
Alignment with Renewables

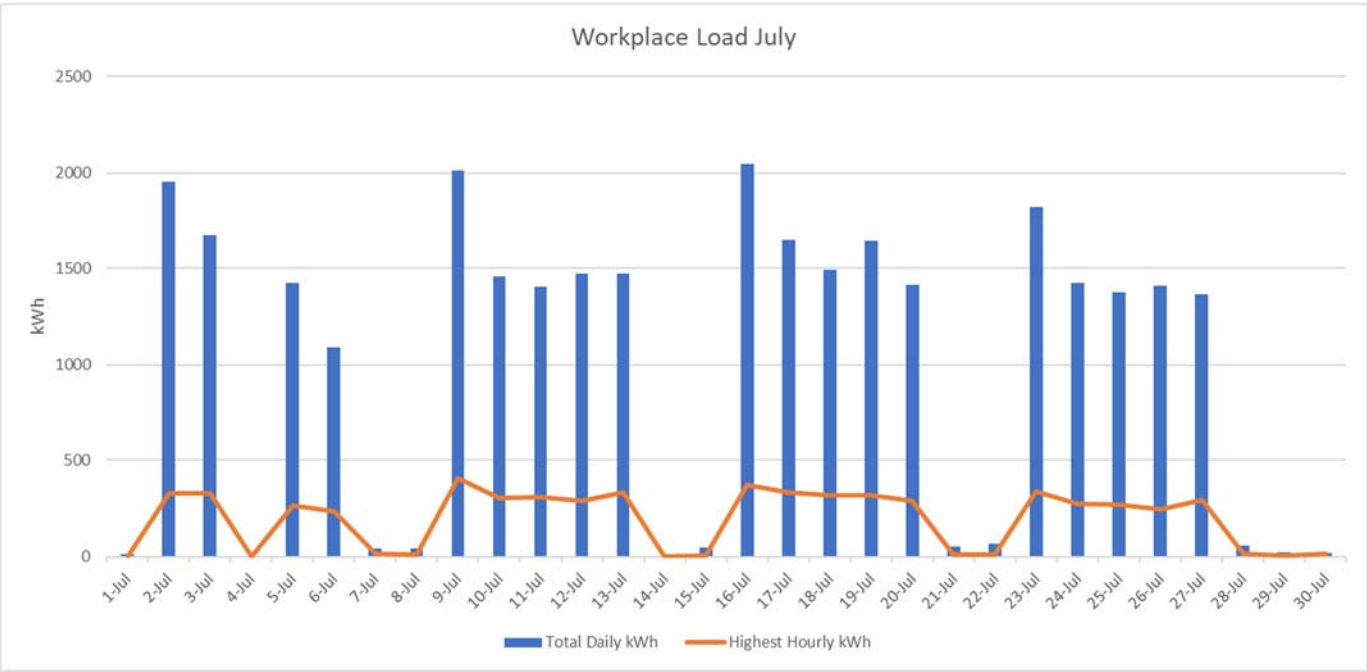
While SDG&E's overall renewable portfolio is above 43%, Power Your Drive has a different load profile compared to SDG&E's overall load profile. Power Your Drive is 67% renewable when comparing energy procurement and generation to usage from January 1st, 2018 through July 31st, 2018, this does not use the same calculations as RPS, but provides a benchmarking of our alignment with renewables. Workplace usage is 69% renewable and Multi-Family usage is 54% renewable. This difference is primarily due to the timing of usage at workplaces in alignment with the high volume of renewables available. Secondarily, the pricing of 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.

Monthly Load Patterns

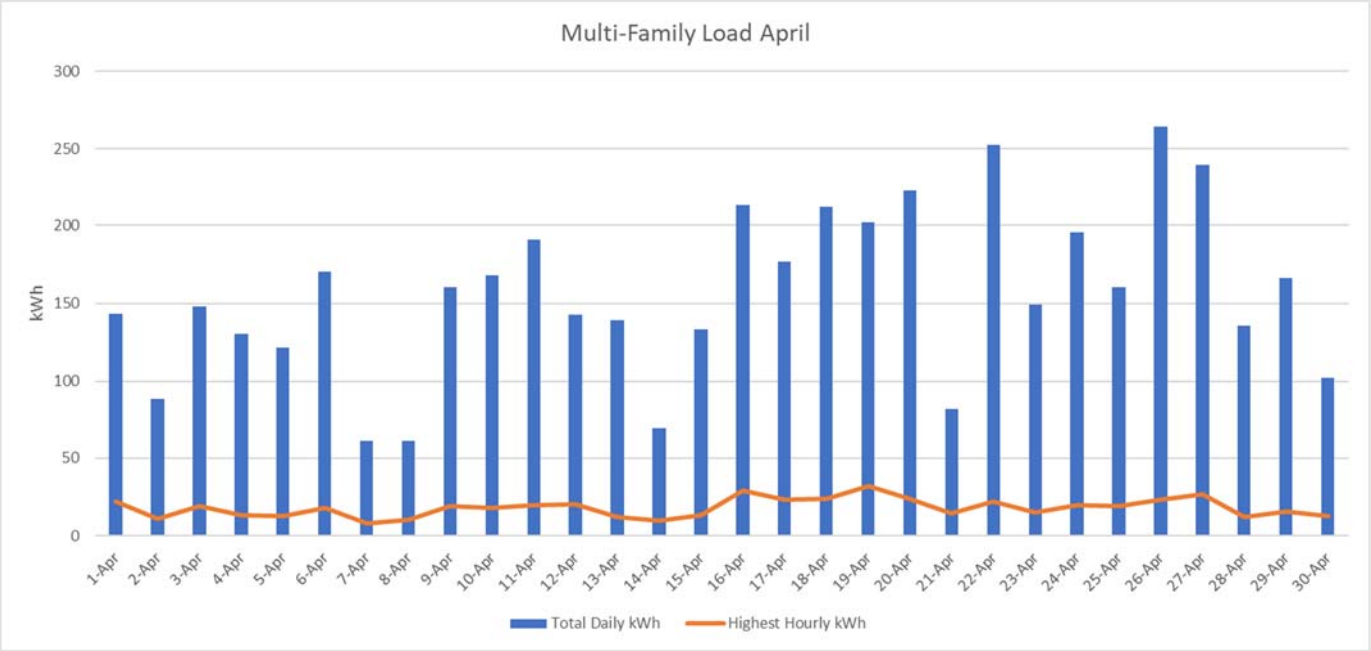
The load patterns for Workplaces and Multi-Family sites have expectedly different shapes.

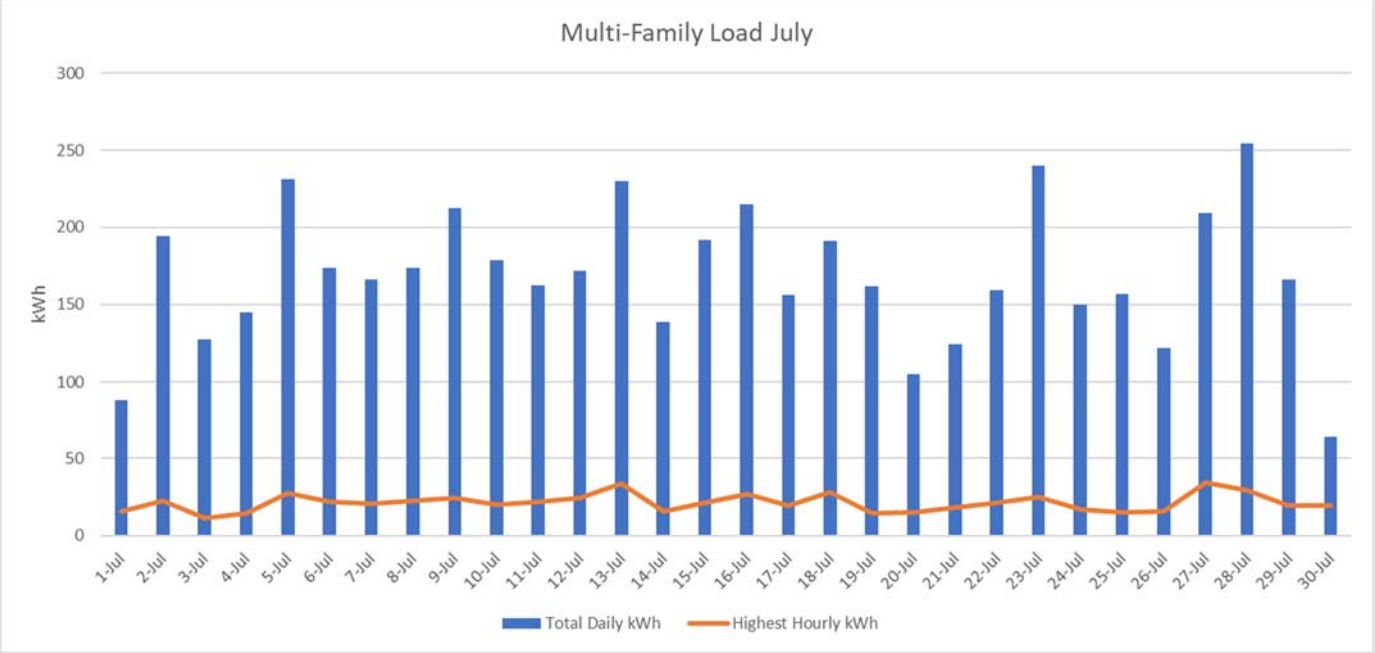
At Workplaces, holidays and weekends show almost no load, with Mondays showing increased demand. There also is a slight up-tick in the highest hourly load on Fridays that do not result in a larger daily load. It is likely that some drivers are willing to pay more and ensure they are charging before the weekend.





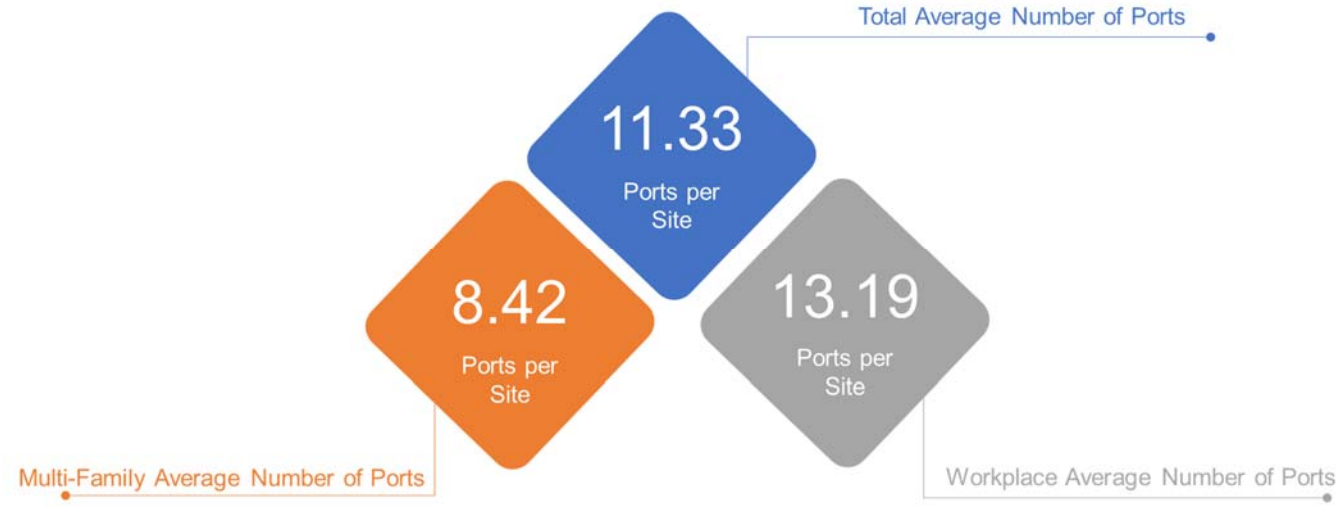
At Multi-Family sites, load is relatively stable throughout the weeks with occasional spikes.





Number of Charging Ports

The original target of the Program was to average 10 charger ports per installation across all projects. The average number of charger ports is slightly more than 8 for multifamily sites and 13 for workplace sites. This increase in the average number of ports per site is to reduce overall cost and maximize the Program benefits by working with customers to satisfy their needs.



SDG&E identified early-on that attracting and qualifying multifamily sites was and continues to be challenging to meet the CPUC program goal of 40% multifamily sites and ports. Data shows that these sites are more expensive primarily due to the lower average number of ports each site requests.

Project Site Cost Trends

The following cost trends are based on the limited site-specific cost estimates we have for approximately 100 early sites that were bid through third party contractor review of designs. This data set does not account for actual costs incurred by the end of the site construction but can indicate cost variances based on expected design. Within this data set, the average number of ports at a Multi-Family site is 8.06, a Workplace is 13.03, and the overall average is 11.01.

When looking between Workplaces and Multi-Family cost comparisons, the Multi-Family sites are approximately 13% more expensive than Workplaces. Although there is a cost premium for Multi-Family projects, SDG&E asserts this cost is artificially inflated because it is measured on a cost per port basis and, therefore, absorbs a site's fixed costs across fewer ports raising the per port cost. Multi-Unit projects typically have less ports than a workplace, and division of the project costs over smaller number of ports will result in a higher port costs

Economies of scale based on the quantity of charging ports for each site are observed to break into four distinct groupings with 6 to 10 ports being our base grouping.

1) Sites with 4 or 5 ports are approximately 23% more costly per port than sites with 6 to 10 ports. All of these sites are Multi-Family sites.
2) Sites with 6 to 10 ports are our base grouping.
3) Sites with 11 to 20 ports are approximately 33% less cost per port than sites with 6 to 10 ports.
4) Sites with 21 or more ports are approximately 51% less cost per port than sites with 6 to 10

ports.

ADA Costs

The California Building Standards Commission codified changes to ADA requirements effective January 1, 2017. These code modifications – which occurred after the Commission issued the decision on Power Your Drive – have required our Program to incur additional costs, not anticipated at the time of Program design, to comply with the new rules. SDG&E did not anticipate such a regulation change and at this time, anticipates the costs are preliminarily order magnitude of between $4M and $7M out of the budget to comply. SDG&E will use this information in its cost calculation for all future pilots and programs.

VIII. Summary & Conclusion

Power Your Drive has made significant progress in the last six months. SDG&E energized eighty-five sites, all with bills reflecting the grid-integrated hourly rate, the first of its kind for a utility EV charging Program. There was more customer interest in the Program than budget could accommodate. Additionally, the hourly rate shows that customers are modifying charging behavior to incorporate pricing incentives. Multiple union construction contractors are completing program construction, bringing increased diversity and competition to the Program and creating high quality jobs. Education, outreach and marketing continues strongly, with the added effort to bring multifamily sites into the Program. It is anticipated that Power Your Drive is on track over the next six months to fully subscribe the pilot, and complete construction on many more sites.

SDG&E is in regular consultation with Energy Division staff and has met with its Program Advisory Council seven times since the Commission approved the Decision. SDG&E appreciates the input it has received and looks forward to continued stakeholder interest.

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	538
	MUDs in DAC among sites in review[4]	31
	WP	611
	WP in DAC among sites in review[5]	60
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	35
	Site Host Agreements Executed	238
	Installations in progress	15
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	

[4] Total number of MUD sites in review: 107.
[5] Total number of WP in review: 166.

	» Site conditions related to construction feasibility and cost (i.e., trenching surface, EVSE mounting surface, condition of facility) » 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		
4) Number of EV site installations	85		
5) Rate *[billing]* option that the site host have chosen *[number of hosts by option, number of drivers]*	Overall List of Sites (includes customers with unsigned Site Host Agreements)[6]	Rate-to-Driver	N/A
		Rate-to-Host	N/A
		Undecided	N/A
	Sites Host Agreements Signed	Rate-to-Driver	166
		Rate-to-Host	40
		Undecided	32
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]*	Powering Down/off	15	
	Host Pricing	0	
	Facility Mgmt	0	
	Other (i.e. email to drivers)	2	
7) Usage *[facility utilization]* rates at	Quartile	Volume	kWh Sold[3]
	25%	94 drivers / 86 sessions	127

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

EV site installations and charging stations *[frequency per quartile of drivers / charging sessions volume and kWh sold per facility]*	50%	84 drivers / 742 sessions		4,165	
	75%	111 drivers / 4,091 sessions		20,970	
	100%	365 drivers / 19,615 sessions		217,728	
	Total[7]	654 drivers / 24,534 sessions		242,990	
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	5,484.6	.1464	.5040	1.7338
	Summer Off-Peak	76,149.0	.1395	.3082	1.7017
	Summer Super-Off Peak	9,558.8	.1321	.2131	1.7338
	Winter Peak	10,113.0	.1374	.1940	.4019
	Winter Off-Peak	128,859.9	.1311	.1828	.7217
	Winter Super Off-Peak	12,396.3	.1328	.1736	.6830
	Totals	242,561.6			
	Single Event	9,958			
	Dual Event	3,924			
9) The amount of the CPUC allocated budget for the Program spent during the last reporting period and the cumulative amount spent	Spend since February 28, 2018	$20,777,078~~$16,054,566~~			
	Spend to Date as of August 30, 2018	$40,735,422~~$31,784,566~~			

[7] 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.
[3] Usage totals may not match due to minor variances between source systems.

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	$31,030.00
	Rate-to-Driver	$25,669.80
B) Deployment of VGI Facilities *[number of]* within Disadvantaged Communities (DAC), including EV Car-sharing deployment	DAC - Workplace	20
	DAC - MUD	10
C) Status of Program Implementation to date	Embedded in this report	
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	51.67 %[8]
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)

[8] As of 07/31/2018.

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 8/31/2018		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** 2	7 **21** 3	8 **101** 8
	Low Solar Penetration	9 **0** 0	10 **2** 0	11 **0** 0	12 **2** 0	13 **1** 0	14 **5** 0	15 **10** 3	16 **18** 4
Res. and C&I Mixed	High Solar Penetration	17 **7** 0	18 **2** 0	19 **21** 1	20 **22** 2	21 **30** 1	22 **61** 6	23 **41** 2	24 **62** 13
	Low Solar Penetration	25 **45** 8	26 **19** 3	27 **56** 4	28 **14** 2	29 **18** 2	30 **13** 2	31 **38** 1	32 **2** 0
Commercial & Industrial Dominant	High Solar Penetration	33 **9** 0	34 **6** 0	35 **8** 0	36 **3** 0	37 **0** 0	38 **1** 0	39 **2** 0	40 **0** 0
	Low Solar Penetration	41 **57** 6	42 **56** 7	43 **44** 3	44 **14** 2	45 **3** 0	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

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