Appendix A

Pacific Power Demonstration and Development Program

Evaluation Report for Washington

Prepared for:

Pacific Power

Submitted by:

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Executive Summary

In 2018, Pacific Power filed its proposed Electric Vehicle Supply Equipment Program (EVSE Pilot Program) with the Washington Utilities and Transportation Commission (Commission) in response to the Commission's policy statement on EVSE. The policy statement requires utilities to take a portfolio approach and is meant to facilitate state transportation electrification goals. After iterating with the Commission and stakeholders, Pacific Power received approval to offer its EVSE Pilot Program (Program), also known as the Washington Transportation Electrification Pilot Program, which began in 2019. This program consisted of three components:

- an Education and Outreach Program: Marketing campaigns, EV-related website tools, educational and awareness activities, and technical assistance services to promote general awareness of electric transportation technologies and services to Pacific Power customers.

- a Demonstration and Development Program: Grant fund awarding to eligible applicants for installation of EV charging infrastructure at nonresidential customer sites.

- And an optional tariff for public DC fast chargers (DCFC).

In 2019, Pacific Power selected Guidehouse (formerly known as Navigant) to evaluate the Demonstration and Development Program, which awarded grant funding to eligible applicants for installation of EV charging infrastructure at nonresidential customer sites. The program granted funding to 19 participants located across eleven municipalities in Pacific Power's Washington service territory.

The intent of this evaluation is to understand how Pacific Power's Demonstration and Development Program addresses certain market barriers to EV adoption, how program EV charging infrastructure is being used by consumers, and whether key findings can be used to inform future program offerings. Guidehouse conducted a series of evaluation activities in 2021 to accomplish the evaluation objectives, including the following:

- Focused surveys with program participants who received grant funding from Pacific Power
- Analysis of EV charging data from EVSE owned by the 19 Pacific Power customers who received grant funding

Key Evaluation Findings

Guidehouse's primary evaluation findings are summarized in Table 0-1.

Table 0-1. Key Evaluation Findings for Demonstration and Development Program

Key Evaluation Findings
The program expanded access to EVSE in Pacific Power's Washington service territory. A majority of program-funded EVSE is available for public charging, with hotel guests/public seen as the second-leading use case. Workplace/public charging was only seen for one use case out of 19 grants awarded.
Total monthly usage across all projects combined has trended upward since the program's inception. This is in part due to additional projects coming online throughout the duration of the program, as well as increased usage at individual stations.
Most charging occurred during daytime hours, peaking around noon and 5pm, and with an average charging duration of three hours.
Not enough survey responses were received to draw meaningful conclusions on the program's impact on the customers and their decisions and behaviors around EVSE.

Source: Guidehouse

Effects of COVID-19 Pandemic

The timing of the Demonstration and Development Program and its evaluation coincided with the ongoing coronavirus pandemic. Guidehouse advises readers of this report to acknowledge that results pertaining to charging station usage and charging profiles may not be reflective of what would have occurred in the absence of the pandemic. The economic impacts, dramatic shift to working from home, and reduced business and leisure travel may have affected charging station usage and the normal charging habits of EV drivers. Furthermore, Pacific Power indicated that some participants of the Demonstration and Development program experienced permitting challenges, staff turnover, and supply chain issues that likely delayed the commissioning of their projects, and ultimately usage of the program charging infrastructure. Grant participants continue to experience supply chain issues that have caused delay in installation of projects

1. Introduction and Evaluation Objectives

In 2017, the Washington Utilities and Transportation Commission (Commission) filed to Docket UE-160799 its Policy and Interpretive Statement Concerning Commission Regulation of Electric Vehicle Charging Services (Policy Statement). This policy statement required utilities to take a portfolio approach to transportation electrification. In 2018, Pacific Power filed plans with the Commission to offer an EVSE Program, which was then approved. The EVSE Program consisted of three components (Education and Outreach Program, Demonstration and Development Program, and an optional public DCFC tariff). In 2019, Guidehouse was selected to evaluate the Demonstration and Development Program.

Pacific Power also offered a related three-year transportation electrification program in its Oregon jurisdiction from 2017 to 2019, which Guidehouse evaluated in 2020. This program also included a Demonstration and Development Program, and Guidehouse applied a similar evaluation approach to the related Demonstration and Development Program in Washington, which is the scope of this evaluation.

Pacific Power serves about 130,550 retail customers in its central and eastern Washington service territory, which is characterized by low adoption of electric vehicles and limited access to publicly available EVSE. Although Washington ranks as one of the top US states for EV sales in recent years, much of the EV adoption activity is focused in the greater Seattle metro area, which falls outside of Pacific Power's territory.

The Demonstration and Development Program was intended to address the high upfront cost transportation electrification market barrier. The program provided supplemental grant funding to non-residential customers to enable them to customize their EVSE solutions. The results of the program will serve as an indicator for the current market need of supplemental funding.

1.1 Report Terminology

Given the emerging nature of the EV and EV charging market, Guidehouse defines some terminology used in this report:

- **Electric vehicle supply equipment (EVSE):** Broadly used term to describe EV charging infrastructure. Generally, the term EVSE can refer to charging equipment of different makes and models and is agnostic to charging level.
- **Charging level:** Refers to the industry-accepted naming convention for the rated kilowatt (kW) capacity of a charging station. The charging levels are usually known as Level 1 (L1), Level 2 (L2), and direct current fast charging (DCFC, also sometimes known as Level 3).
- **Charging station:** Refers to the charging device hardware, which may be a pedestal mount, wall mount, or other configuration. It is often used interchangeably with EVSE, although generally it refers to singular or plural charging devices.
- **Charging port:** Refers to the plug that connects to an EV. A charging station may contain multiple charging ports.

1.2 Evaluation Objectives

At a high level, this evaluation was intended to assess how Pacific Power's Demonstration and Development Program addressed the market barriers of upfront cost and gaps in accessibility and availability, and how program charging infrastructure is being used by EV drivers.

1.3 Evaluation Activities

Guidehouse evaluated the program by reviewing program materials and tracking data, analyzing utilization and interval data from the charging stations, and collecting feedback from participating customers through surveys. Table 1-1 provides an overview of the key evaluation activities. The subsequent sections of this report contain a more complete description of each activity

Table 1-1. Overview of Key Evaluation Activities

Project Element	Major Evaluation Activities
Demonstration and Development Program	• Survey grant funding recipients electronically. • Analyze participant EVSE data. • Assess program impacts on enabling expanded or more advanced EVSE deployment. • Develop summary of EVSE characteristics and effects of grant recipient education and awareness activities.

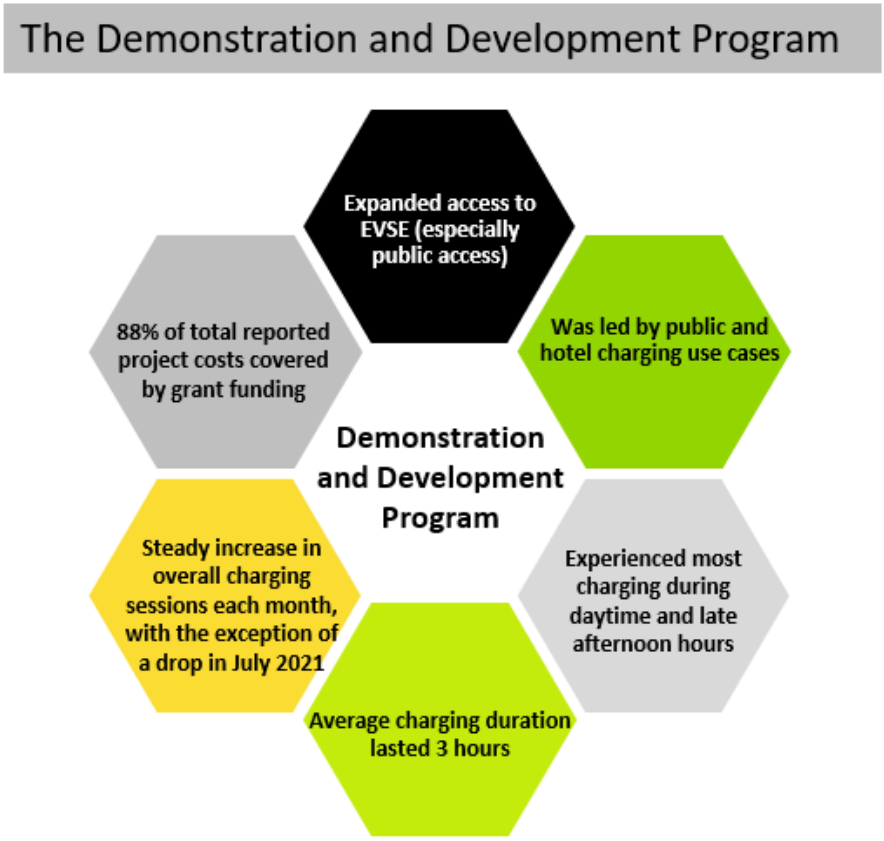
Source: Guidehouse

2. Demonstration and Development Program

2.1 Key Findings – Demonstration and Development Program

The Demonstration and Development program achieved key goals of expanding access to EVSE and enabling customers to deploy EVSE sooner or when they otherwise would not have. Figure 2-1 outlines the key evaluation findings.

Figure 2-1. Demonstration and Development Findings



- 19 grants awarded across 11 municipalities
- 24 charging ports, all with public access
- 10 MWh of energy delivered
- 694 charging sessions, averaging 16 kWh each
- 86+ individual users[1]

Source: Guidehouse

[1] Distinct user IDs were not available for three out of seven reviewed projects.

The Demonstration and Development program expanded access to EVSE in Pacific Power's service territory and covered 88% of total reported project costs. The grant-funded project sites are distributed across Pacific Power's Washington service territory, with the majority of projects located in Yakima. All projects provided public access to charging. Program funding reached a wide range of business types, and hotel/public charging was also a leading use case after public charging.

Only four out of the 19 active applicants responded to the survey, making it difficult to draw meaningful conclusions representative of the entire applicant pool. Not enough information was received to determine whether the program was effective in reaching various types of customers and its influence on their decision-making and behavior.

More than 10 MWh of energy was dispersed from the program EVSE during about 700 charging sessions over the evaluation period. Most charging occurred during daytime and late afternoon hours, with average charging duration lasting three hours. The program saw a steady increase in overall charging sessions each month, with the exception of a drop in July 2021, potentially a result of the start of summer holidays.

2.2 Demonstration and Development Program Summary

The Demonstration and Development Program provides customers with grant funding to offset the costs of installing EVSE at nonresidential sites. The grants are awarded through a competitive application process with the goal of identifying projects that will address key market barriers and reach areas that are underserved by the existing market. Customers can receive funding that covers up to 100% of the total eligible costs of their projects.

Pacific Power administered quarterly grant awarding cycles beginning in 2019 and ending in Q1 2021. A third-party grant manager applied certain predetermined evaluation criteria to score each project for the award process. These criteria were summarized in Pacific Power's program overview[2] and included:

- Project feasibility
- Use of funds
- Innovation and analysis
- Equity
- Educational, environmental, and community benefits

Pacific Power selected 20 projects for grant award funding, with 19 projects accepting the grant. Excluding the one project that withdrew its application, the total funding amounted to over $860,000, which covered about 88% of the total reported project costs.

[2] Charging Station Grants Funding Criteria (pacificpower.net)

2.3 Demonstration and Development Evaluation Objectives and Activities

2.3.1 Objectives

Pacific Power wanted to understand how three specific market barriers were affected by utility-sponsored grant funding to supplement the cost of private EVSE deployment at nonresidential customer sites:

- **High upfront cost to invest in electric transportation technology:** Explored the effect of grant funding to enable EVSE projects to occur at greater scale or earlier timing than would have otherwise occurred in absence of the program.
- **Lack of accessible EVSE:** Explored how the grant funding enabled EVSE development in challenged market segments or underserved geographic locations.
- **Lack of awareness of electric transportation options and benefits:** Explored how the awareness or educational activities undertaken by grant recipients may have promoted broader awareness of EV charging technologies and how grant funding may have supported more advanced or innovative EVSE configuration than would otherwise have occurred.

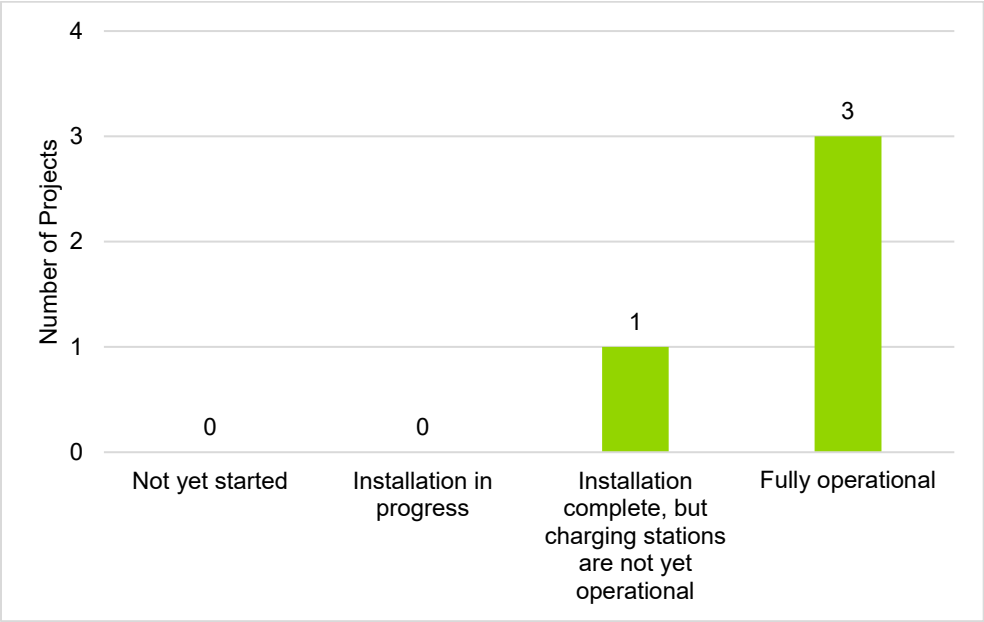
2.3.2 Activities

Guidehouse performed the following activities to address the evaluation objectives:

- **Assess grant project characteristics:** Guidehouse reviewed information from grant project application files to summarize qualitative and quantitative characteristics of the project sites. Pacific Power provided Guidehouse with data about the project sites selected for grant awards, along with the grant application file from each site. The evaluation team used this information to develop a summary of the project characteristics to understand the technology trends and site features being represented by the program.
- **Survey grant recipients:** Guidehouse administered electronic surveys with customers who received grant awards to assess their experience with the program. The surveys also evaluated the impacts that grant funding had on the equipment selection, project scope, and timing relative to what may have happened in the counterfactual scenario where customers did not receive grants.

Guidehouse received survey responses from four grant recipients, which represents about one-fifth of all participants. Participants had over three weeks to complete the surveys, with two reminder emails sent out during the period. As Figure 2-2 shows, the survey responses are representative of participants with EVSE installations complete, or 40% of all participants with installations complete. No responses were received from participants with installations still in progress.

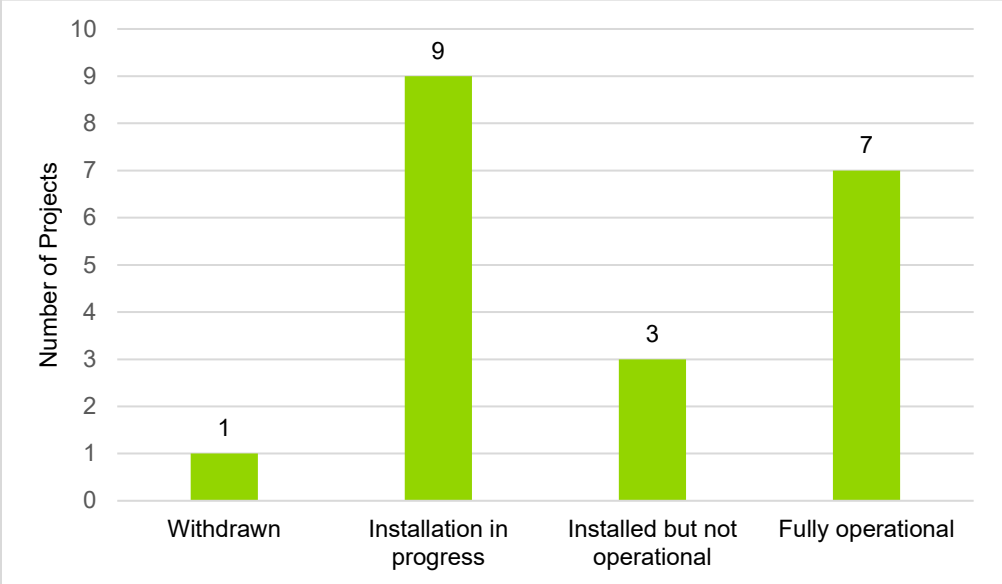
Figure 2-2. Survey Results: Status of Survey Respondents' EVSE Projects (n=4)



Question: "How would you describe the current status of your EV charging infrastructure project?"

Source: Guidehouse analysis

Figure 2-3. Status of All EVSE Projects (n=20)



Source: Guidehouse analysis

- **EVSE utilization analysis:** Guidehouse analyzed all available data from the grant project EVSE to develop a set of metrics that characterize how the chargers are being used and are affecting the grid. The available data included session-level information unique to each charging event and hourly and 15-minute interval data for energy (kWh) and demand (kW) impacts. Data was only available from the projects that had completed construction and were connected to its EVSE vendor platform (7 projects).

2.4 Demonstration and Development Results and Findings

The evaluation findings are presented to illustrate how the program addressed the key market barriers Pacific Power identified.

2.4.1 How the Program Addressed the High Upfront Cost of EVSE for Nonresidential Customers

Guidehouse used the participant surveys to evaluate the program impact on this barrier. The surveys included a series of questions exploring the impact of grant funding on the ultimate project outcome. These questions assessed whether the grant recipient had any prior existing plans to develop EVSE, whether the funding enabled greater scope or scale of the EVSE project, whether the EVSE was installed sooner than otherwise would have occurred, and whether the project resulted in extended benefits to the participants.

Two of the four survey respondents reported they considered installing EV charging infrastructure at their facilities prior to participating in Pacific Power's program. Those who had considered installing were then asked to rate, prior to participating in the program, how much planning they had done for equipment selection or installation. As Figure 2-4 shows, one respondent indicated minimal planning, and the other indicated that they had done moderate planning, but not yet identified and selected specific sites and equipment. This finding may suggest that the program was effective in reaching customers who either had not yet considered EV charging infrastructure or were in the early stages of planning. However, since these responses only reflect the attitudes and behavior of two participants, the findings may not be representative of all the participants.

Figure 2-4. Survey Results: Prior Planning for EVSE at Customer Sites (n=2)[3]

Question: "Please identify how far along you were in your plans to install charging equipment before participating in the grant program."

Source: Guidehouse analysis

To explore the counterfactual scenario, Guidehouse asked those that had previously considered installing charging infrastructure to indicate the likelihood they would have installed the same charging infrastructure in the absence of Pacific Power's program. The two respondents who

[3] Two out of four survey respondents answered this question

answered the previous question both responded that they may have installed the same EVSE in the absence of the program.

Those two respondents were then asked to estimate the timing of when that installation would have occurred in the absence of the program. One respondent indicated that they would have waited between two and four years before installing, while the other indicated that they would have installed EVSE at the same timeframe regardless of the program.

To understand how the program may have affected the equipment and site selection, Guidehouse asked respondents to comment about how the program changed their existing plans for EVSE installation in terms of site location, number of chargers, level of charging (i.e., L1, L2, DCFC), and equipment choice. The survey only asked these questions to respondents who indicated they had considered installing EVSE prior to participating in the program. Findings from the two respondents are listed below.

- **Number of chargers:**
  - Both respondents indicated the program enabled them to increase the number of chargers at the site.
  - One respondent indicated the program also expedited the install of chargers.
- **Level of charging and equipment choice:**
  - Both respondents indicated the program did not impact their level of charging and equipment choice decisions.

Although only two participants responded to these questions, it did suggest that the program enabled these customers to install additional ports.

2.4.2 How the Program Addressed the Lack of Accessible EVSE in Pacific Power's Service Territory

Guidehouse developed a summary profile of the grant recipient sites to understand key geographic, customer, technology, and user characteristics.

2.4.2.1 Geographic Characteristics

Pacific Power awarded grant funding for 19 projects at 19 different locations (no customers submitted multiple projects). The projects included 24 EV charging ports that have activated their data networks and are fully operational. Some geographic characteristics of the project sites include the following:

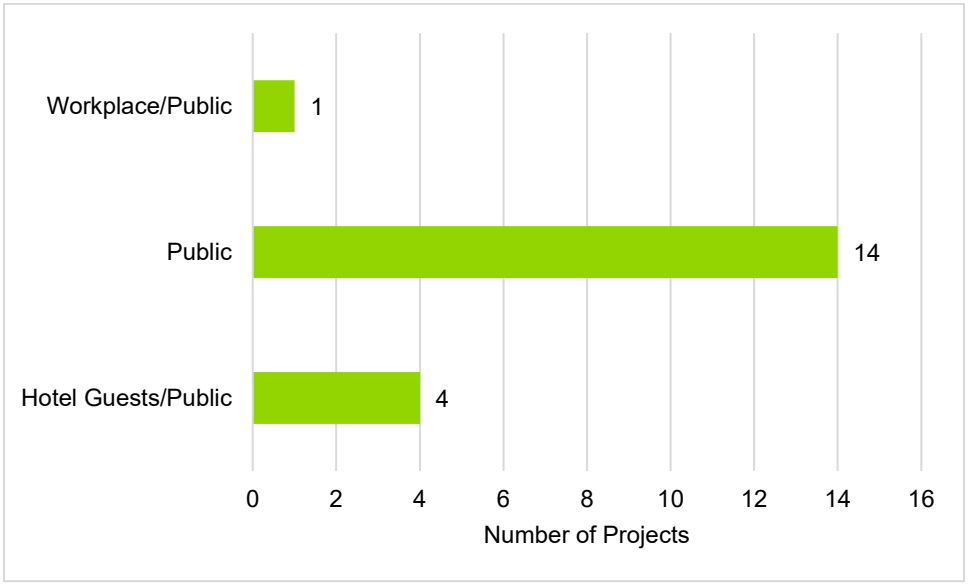
- The project sites were distributed amongst 11 different municipalities across Pacific Power's Washington service territory.
- More grants were awarded to customers in Yakima than any other municipality. This included seven projects with 29 charging ports[4], representing about 50% of the charging ports associated with all in-progress and installed projects.

[4] 10 the 29 charging ports in Yakima have been activated and are transmitting data.

2.4.2.2 Customer Characteristics

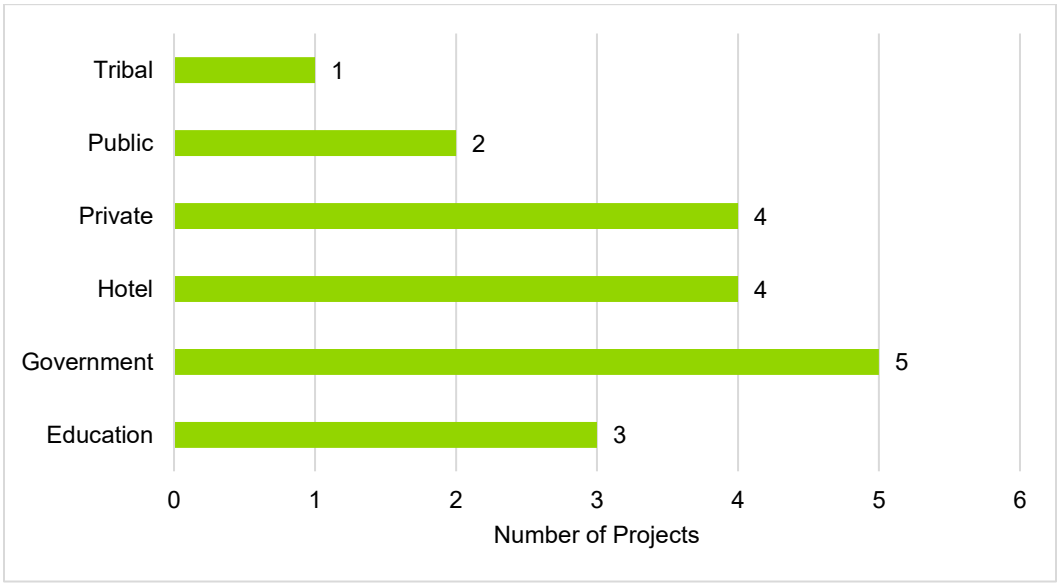
During the application process, grant recipients provide information about which market segments will be served by their EVSE, as well as information about their organization. Figure 2-5 shows that most charging projects will be accessible for public use, with the second leading use case being for both hotel guests and public. Figure 2-6 shows that government was the leading organization type to receive grant awards, followed by hotel and private facilities.

Figure 2-5. Grant Project Use Cases (n=19)



Source: Guidehouse analysis

Figure 2-6. Grant Project Organization Type (n=19)

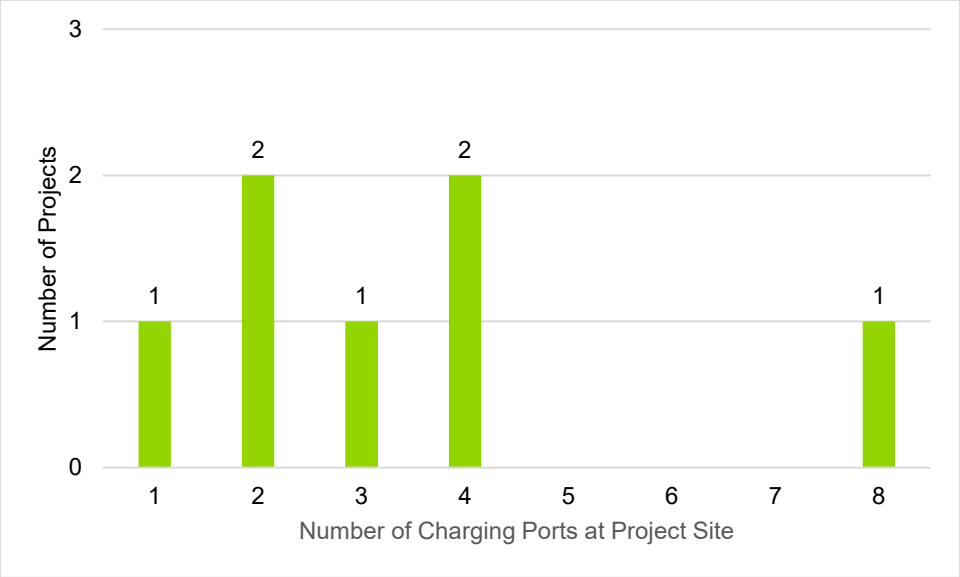


Source: Guidehouse analysis

2.4.2.3 Technology Characteristics

Grant recipients selected EVSE equipment from five different technology vendors, although a single vendor accounted for over half of all projects. EVSE types were only available for the seven projects that were transmitting data. Six of those grant projects include L2 charging and one grant project included a DCFC station. On average, each project includes 3.4 charging ports. Most projects had between one and four ports total, with the exception of one project which had eight ports total as shown in Figure 2-7.

Figure 2-7. Distribution of Charging Ports per Project (n=7)

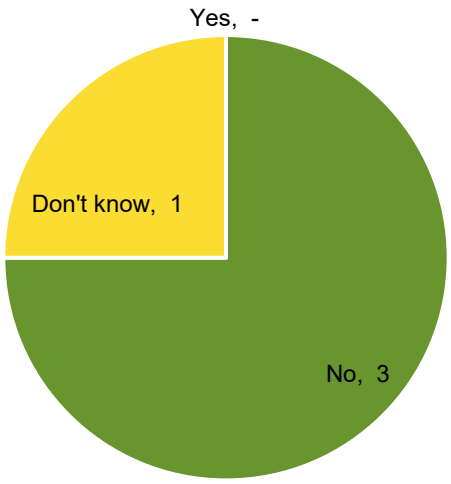


Source: Guidehouse analysis

2.4.3 How the Program Addressed the Lack of Awareness of Electric Transportation Options and Benefits

Guidehouse used the participant surveys and grant application files to collect information about how grant participants used their projects to spread awareness of electric transportation options. Figure 2-8 shows that 75% of survey respondents indicated they had not performed educational activities related to their EVSE grant projects. One-quarter of respondents, equating to one participant, was not sure whether awareness activities were conducted.

Figure 2-8. Survey Results: Grant Recipients Who Conducted Awareness Activities (n=4)



Question: "As a result of participating in this grant program, has your business conducted any education activities related to EVs or EV charging?"

Source: Guidehouse analysis

2.4.4 Additional Benefits Associated with Program Participation

Guidehouse asked survey respondents to identify additional benefits that their business may have experienced as a result of participating in the program and to identify whether participation in the program influenced them to deploy additional EV charging infrastructure beyond their grant project.

2.4.4.1 Additional EVSE Beyond That Funded by the Program

Figure 2-9 shows that one survey respondent indicated that their experience with the program influenced them to install additional EVSE beyond that funded by the grant award, while one respondent was not sure, and two respondents indicated they were not influenced to incorporate additional EVSE beyond the amount installed using grant funding.

Figure 2-9. Survey Results: Grant Recipients Who Considered Installing Additional EVSE (n=4)

Question: "Did your experience with the grant program in any way influence you to incorporate additional EV charging infrastructure beyond the amount you installed using the grant funding?"

Source: Guidehouse analysis

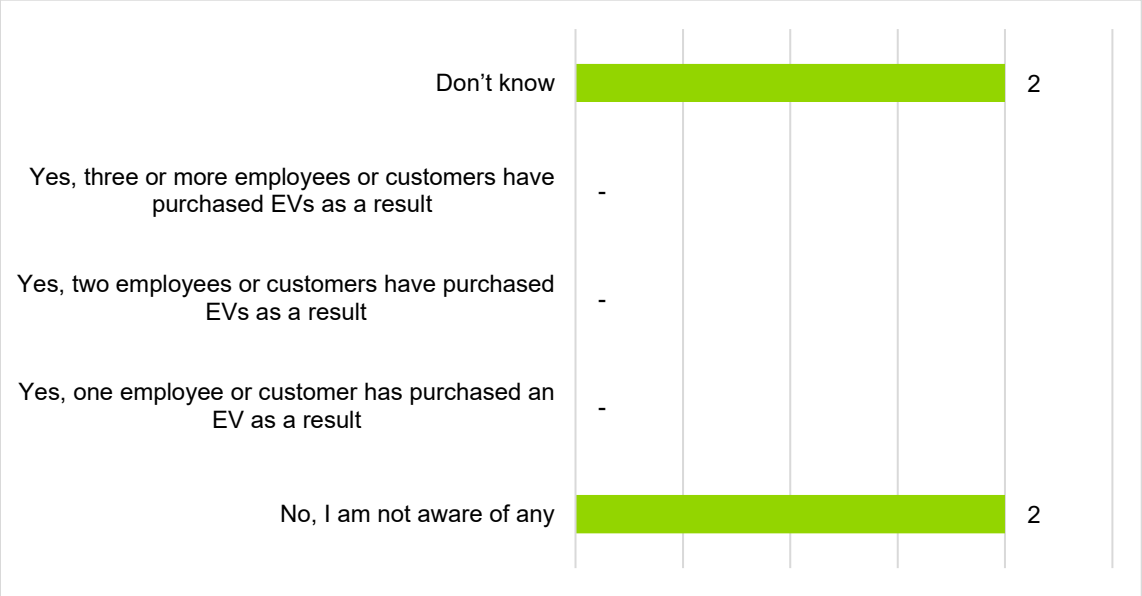
When asked to rate on a scale of 0-10 how important the program participation was in the respondent's decision to install the additional EVSE, the respondent indicated a score of 10, meaning the program was extremely important in their decision to pursue additional EVSE. This finding suggests the program may contribute to the deployment of additional EV chargers beyond those incentivized by the grant funding, though more responses would be needed to draw a more meaningful conclusion.

2.4.4.2 Other Impacts, Benefits, and Information Reported by Program Participants

The survey asked grant recipients if the addition of EV charging infrastructure had any notable impact on their business. Only one participant responded, indicating that the infrastructure has not impacted their business.

The survey also asked respondents to indicate whether they were aware of any employees or customers who had purchased an EV as a result of the charging infrastructure at the respondent facilities. As Figure 2-10 shows, respondents were not aware of any EV purchases as a result of the charging infrastructure.

Figure 2-10. Survey Results: Reported Awareness of New EV Purchases (n=4)



Question: "Are you aware of any employees or customers who have purchased an EV as a result of the charging infrastructure at your facility?"

Source: Guidehouse analysis

2.4.5 EVSE Utilization Analysis

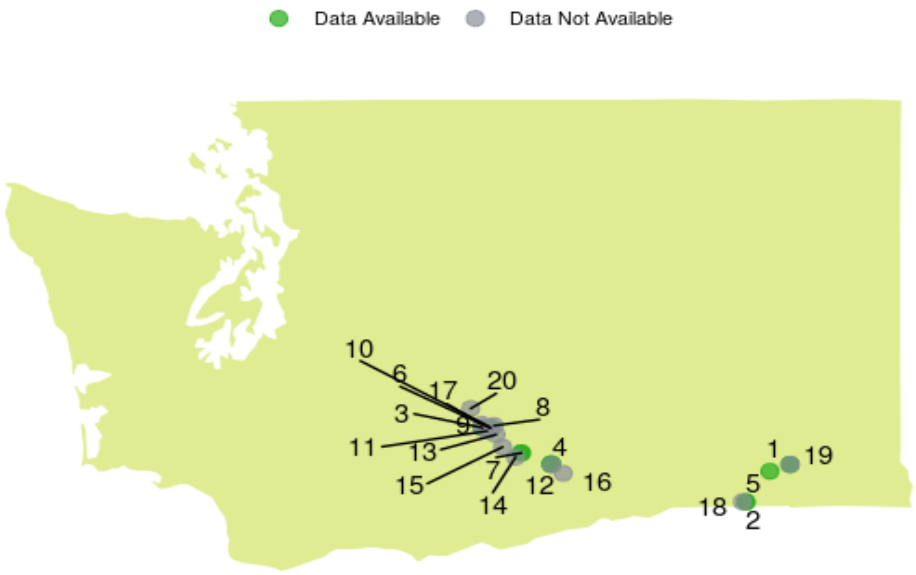
Guidehouse analyzed EVSE interval and session data from grant projects that had operational EVSE and were connected to ChargePoint, SemaConnect, and Greenlots platforms. Out of the 19 total active grant projects, data was not available from EVSE hardware vendors for 12 grant projects. The 7 grant projects that did have available data and are included in this analysis are shown in Figure 2-12, and consist of 17 total stations. These figures demonstrate a wide geographic distribution of the grant project EVSE sites throughout Pacific Power's Washington territory. All these projects include L2 chargers with the exception of Grant Project #1, which included both a DCFC and L2 charging station. For this report, Guidehouse presented the EVSE analysis on a per-project basis to align with how Pacific Power awarded the grant funding. The grant projects analyzed include charging stations deployed at multiple locations, typically in close proximity. Therefore, the results for a given project site are an aggregate of all chargers and ports associated with that grant project.

Table 2-1. Number of DCFC and L2 Ports by Grant Project

Grant Project	Number of DCFC Ports	Number of L2 Ports
Grant Project 1	2	1
Grant Project 2	0	2
Grant Project 3	0	2
Grant Project 4	0	4
Grant Project 5	0	1
Grant Project 6	0	8
Grant Project 7	0	4

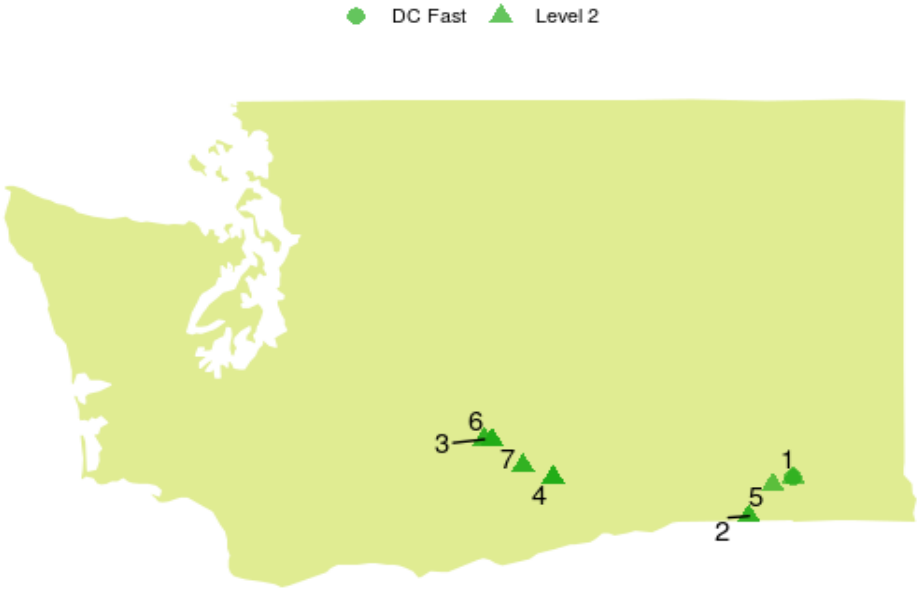
Source: Guidehouse analysis

Figure 2-11. Location of Grant Project Sites



Source: Guidehouse analysis

Figure 2-12. Location of Grant Project Sites with Data Available for Analysis



Source: Guidehouse analysis

2.4.5.1 Charging Session Activity

Nearly 700 charging sessions occurred across the program during the time of this evaluation. Table 2-2 summarizes charging activity at each project site and the date that each project became operational. The first project became operational in August 2020, and the most recent project in March 2021. Most charging stations are used a few times each week, except for Grant Project 7, which sees only an average of three sessions per month.

Table 2-2. Summary of Charging Activity by Project

Grant Project	Day of First Event	Ending Date	Number of Days in Operation	Number of Sessions	Average Sessions per Day	Average Sessions per Week	Average Sessions per Month
Grant Project 1	2020-12-15	2021-09-30	290	54	0.19	1.30	6.00
Grant Project 2	2021-01-06	2021-09-30	268	187	0.70	4.90	21.00
Grant Project 3	2021-03-09	2021-09-30	206	50	0.24	1.70	7.00
Grant Project 4	2021-02-06	2021-09-30	237	174	0.73	5.10	22.00
Grant Project 5	2021-01-02	2021-09-30	272	74	0.27	1.90	8.00
Grant Project 6	2021-02-12	2021-09-30	231	117	0.51	3.50	15.00
Grant Project 7	2020-08-10	2021-09-30	417	38	0.09	0.60	3.00

Source: Guidehouse analysis

On average, about 16 kWh was dispersed during a typical charging session, as shown in Table 2-3. A total of 87 or more distinct users charged their EVs at the grant project sites.[5] On average, EVs were plugged into the station for 3.23 hours per charging session and charging for about 3.02 hours on average. Figure 2-13 shows the distribution of charging session durations across all program EVSE locations.

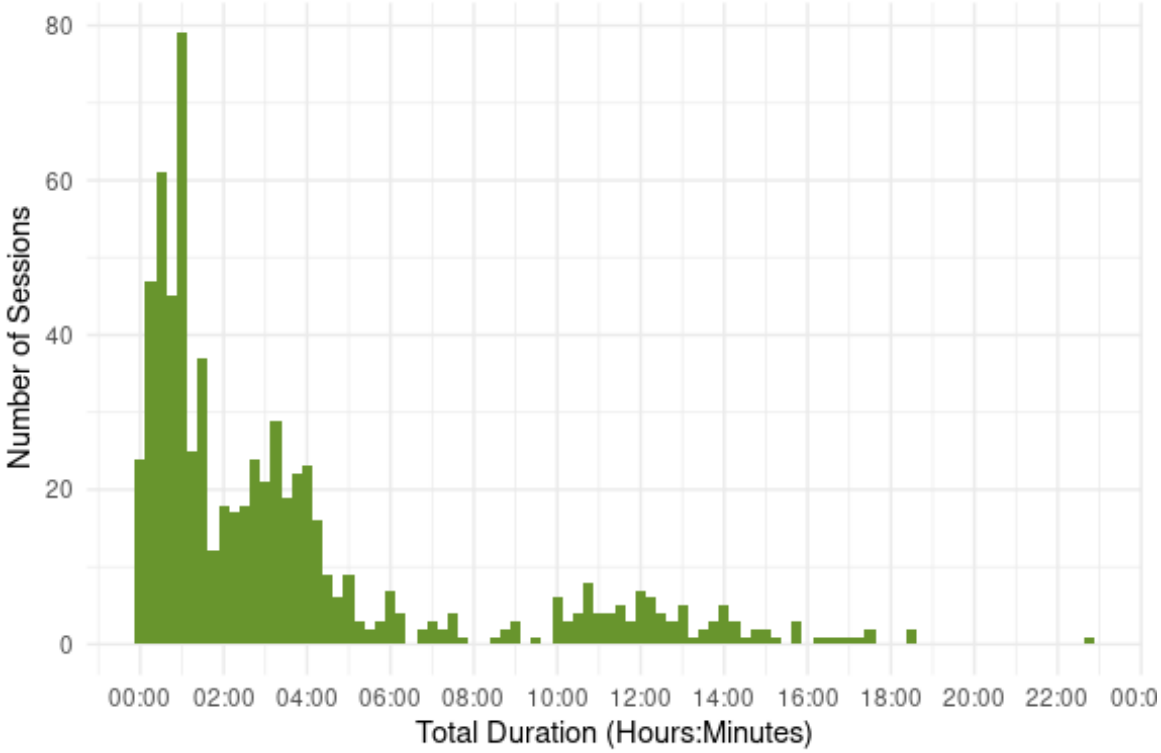
Table 2-3. Session Characteristics

Station	Number of Sessions	Average Time EV Plugged in per Session (H)	Average EV Charging Time per Session (H)	Average Energy per Session (kWh)	Number of Distinct Users
All Stations	694	3.23	3.02	16.25	86+

Source: Guidehouse analysis

[5] A distinct user is defined by a unique account ID in the charging session data. Guidehouse did not have the information to determine if a single person could have multiple account IDs, or if multiple people could share a single account ID. Three out of seven sites did provide unique account IDs. These sites were not included in the total count of distinct users.

Figure 2-13. Distribution of Grant Project EVSE Charging Session Duration (n~694)



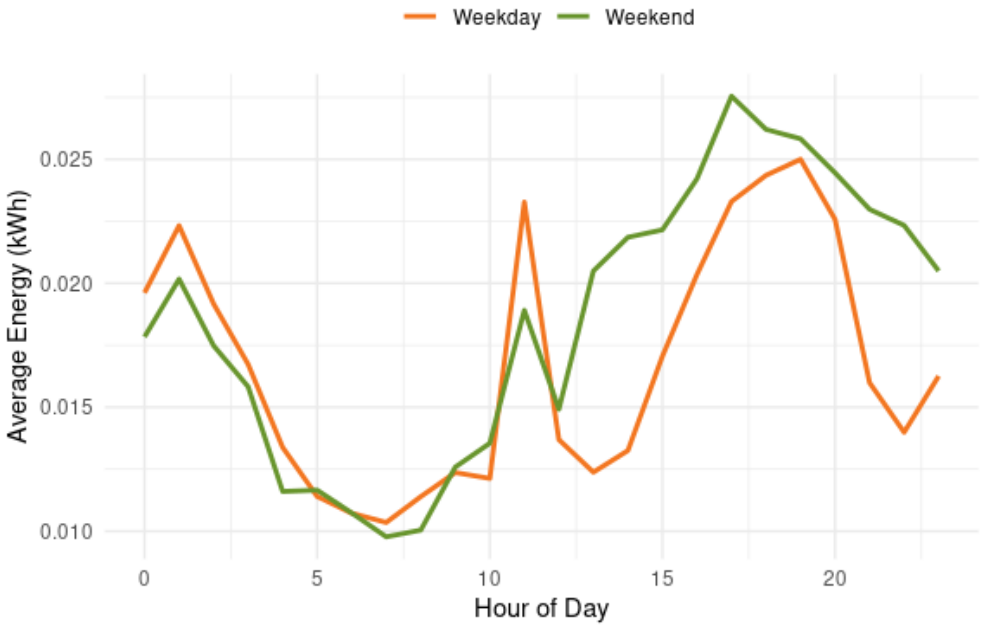
Source: Guidehouse analysis

2.4.5.2 Energy and Power Impacts

Figure 2-15 shows the aggregate charging load profiles for weekdays and weekends across all grant project EVSE. Most charging occurred during the daytime and late afternoon hours, with similar profiles occurring on weekdays and weekends, but with weekends seeing more DCFC charging. However, since this evaluation only had data from one DCFC station, meaningful conclusions cannot be drawn at this time.

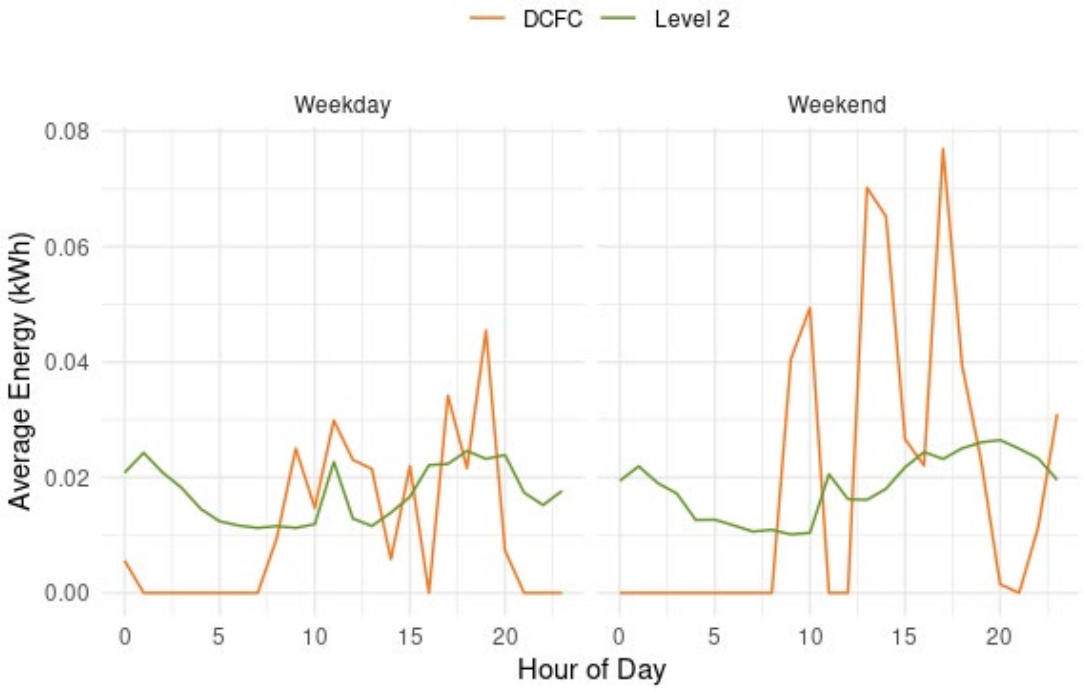
The current charging profile is dominated by L2 charging, due to only one DCFC station installed. As more DCFC get installed, the overall load shape as shown in Figure 2-14 is likely change.

Figure 2-14. Charging Load Profiles by Day Type (L2 and DCFC Combined)



Source: Guidehouse analysis

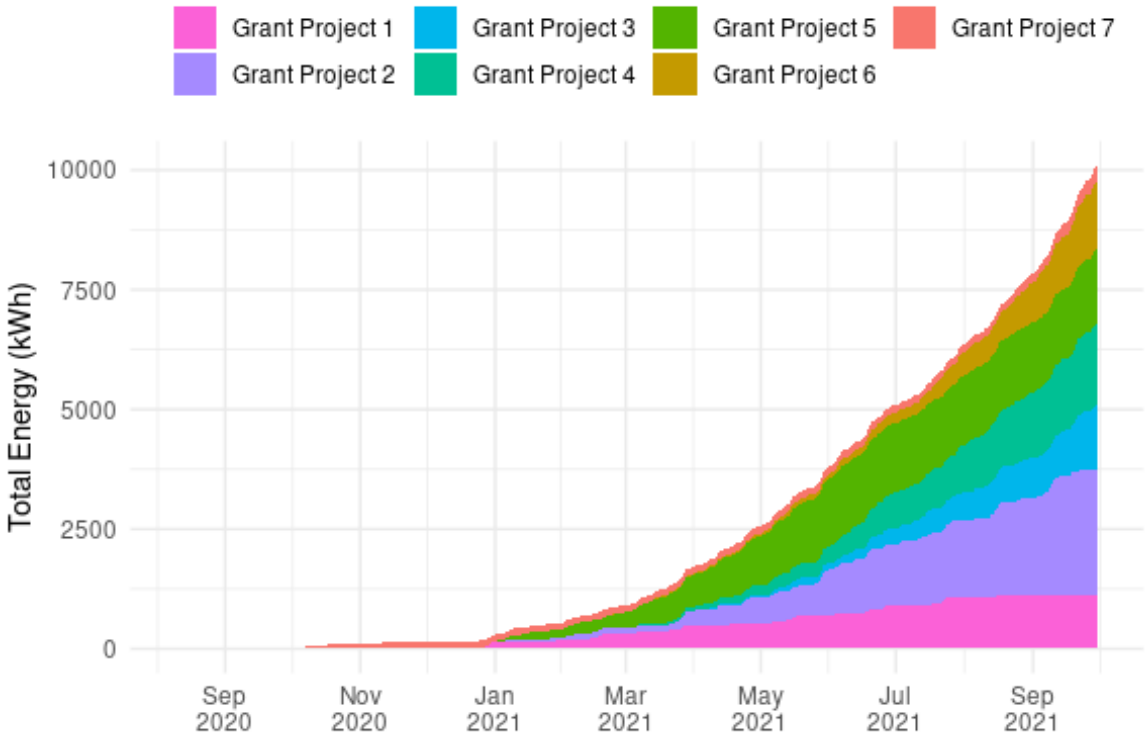
Figure 2-15. Charging Load Profiles by Day Type and Port Type



Source: Guidehouse analysis

Figure 2-16 shows the cumulative energy consumption for the grant project EVSE. About 10 MWh of energy had been dispersed by the grant project EVSE as of this evaluation.

Figure 2-16. Cumulative Energy Consumption for Grant Projects



Source: Guidehouse analysis

Table 2-4 summarizes charging station use and the energy and demand impacts. The percentage of time that any given charging station was in use ranged from about a 0.13% to over 11%.

Table 2-4. Grant Project EVSE Usage and Impacts

Site	Number of Days in Operation	Percent of Time Charging Station in use	Energy (kWh)	Max Hourly Power (kW)	Rated Capacity (kW)
Grant Project 1	290	0.48%	1,138	48.66	107.20
Grant Project 2	268	11.24%	2,588	17.74	14.40
Grant Project 3	206	2.05%	1,356	14.25	14.40
Grant Project 4	237	1.52%	1,704	14.51	28.80
Grant Project 5	272	3.71%	1,570	7.31	7.20
Grant Project 6	231	0.74%	1,422	18.26	57.60
Grant Project 7	417	0.13%	319	7.36	28.80

Source: Guidehouse analysis

2.4.5.3 EVSE User Characteristics

In total, 87+ individual users charged at the program-funded EVSE. Table 2-5 shows additional charging session details by grant project. By comparing the number of distinct users at each site with the total number of sessions, Guidehouse found that certain EV drivers charged multiple times at the same location.

Table 2-5. Charging Session Details by Grant Project Location

Site	Number of Sessions	Average Total Time per Session (Hours)	Average Charging Time per Session (Hours)	Average Energy per Charge per Session (kWh)	Number of Distinct Users[6]
Grant Project 1	54	1.69	1.66	21.08	26
Grant Project 2	187	6.67	6.67	13.84	N/A[7]
Grant Project 3	50	5.13	4.04	27.23	12
Grant Project 4	174	1.73	1.72	9.79	N/A
Grant Project 5	74	3.29	3.29	21.22	N/A
Grant Project 6	117	2.74	2.44	12.16	29
Grant Project 7	38	1.34	1.33	8.41	20

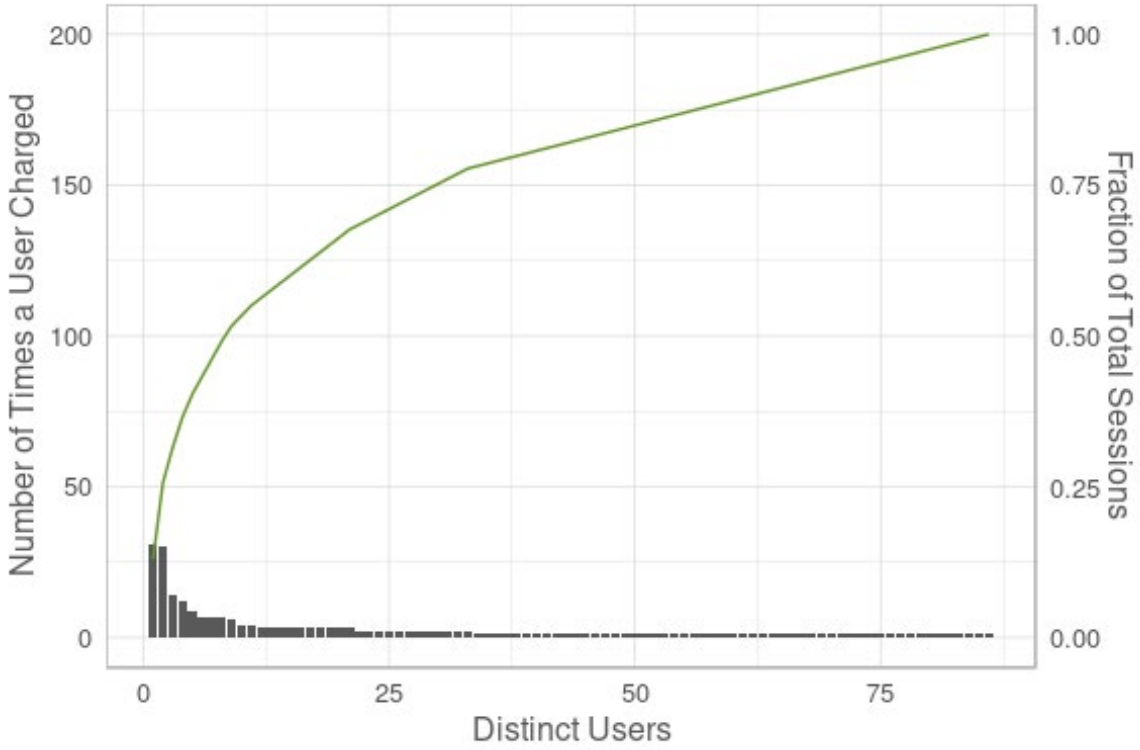
Source: Guidehouse analysis

Figure 2-17 shows the distribution or charging sessions by each individual user, demonstrating that a relatively small number of individuals are using the chargers frequently.

[6] There is one user that had charging sessions at two different charging stations (Grant Project 6 & 7), so the actual number of distinct users for grant projects 1, 3, 6 and 7 is 86.

[7] User data not available from vendor

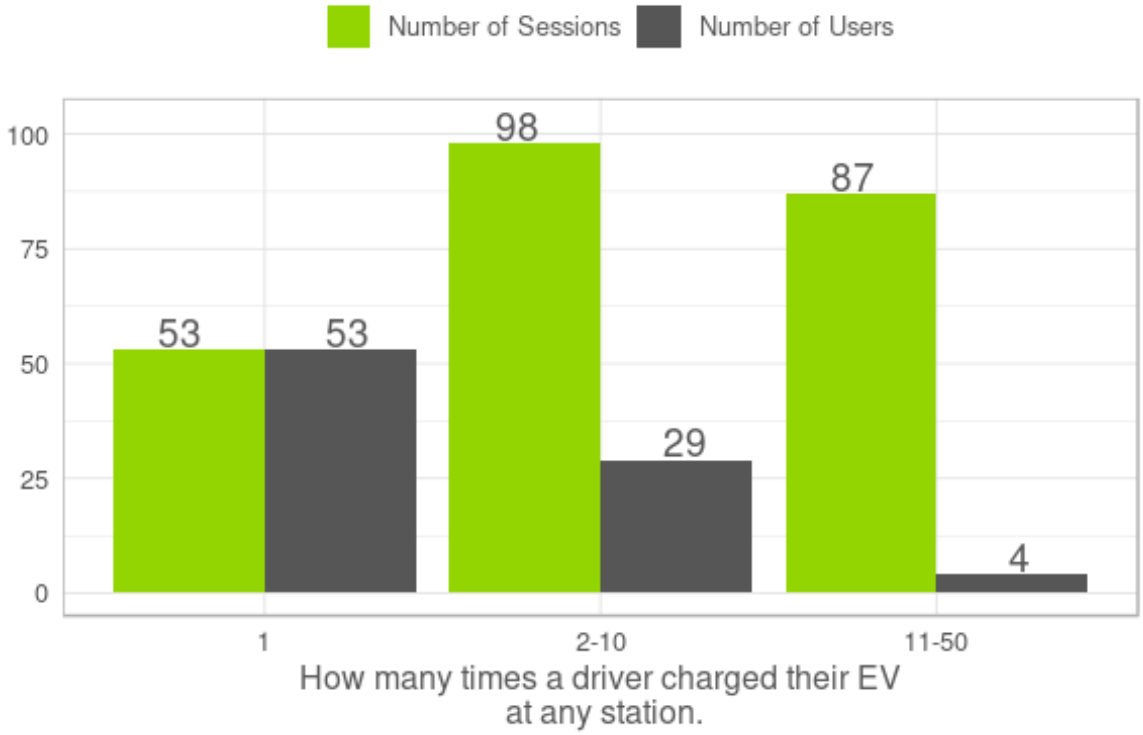
Figure 2-17. Histogram Showing Number of Charging Sessions by User



Source: Guidehouse analysis

Figure 2-18 presents user frequencies in a different format. On the far left, the figure shows that 53 individual users completed one charging session each. On the far right, the figure shows that four individual users each completed between 11 and 50 charging sessions, for a total of 87 charging sessions.

Figure 2-18. Distribution of Users Completing Increments of Charging Sessions[8]



Source: Guidehouse analysis

2.4.5.4 Grant Project EVSE Monthly Usage

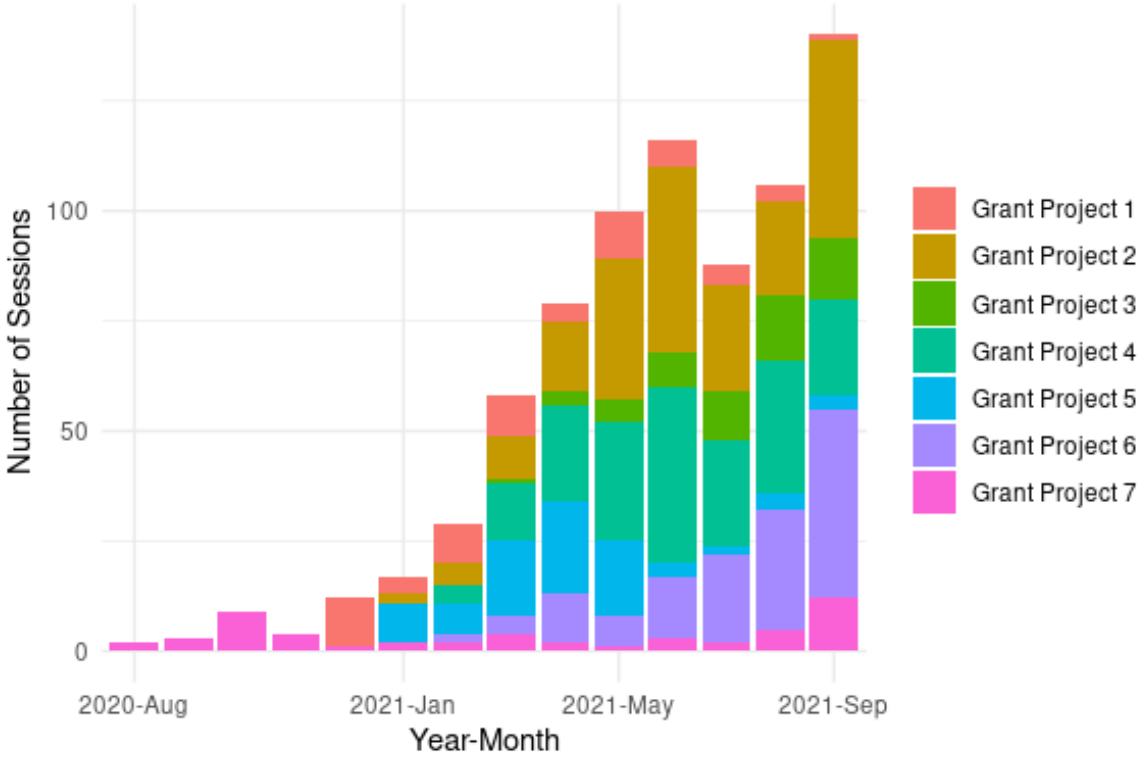
The entirety of this project has coincided with the ongoing COVID-19 pandemic, which has disrupted the typical daily commute and driving patterns. Figure 2-19 shows varied usage patterns across the grant projects evaluated.

Since most projects became operational around January 2021, a steady growth in the number of sessions can be seen until July 2021, when a sudden drop off occurs, largely due to a decrease in usage from Grant Project 2, 4 and 5 (hotel and governments). This is then followed by a steady increase again through September.

Grant Project 6, corresponding to an education organization type, has seen a steady increase in usage, while Grant Projects 1 and 5, corresponding to a government organization type and public use case, have seen a decrease in activity. Grant Projects 2, 4, and 6 have seen the most amount of activity overall, corresponding to hotel, government, and education organization types with public use cases. Due to the small nature of the data set observed, meaningful conclusions cannot be drawn on typical monthly usage, though it can be observed that typical usage can vary significantly across similar organization types.

[8] This chart only shows sessions associated with users that have unique user IDs. Session data received from vendors that have missing user IDs are excluded from this chart, but are included in all the other session data shown in this report.

Figure 2-19. Grant Project EVSE Monthly Usage



Source: Guidehouse analysis

3. Recommendations

It appears that Pacific Power's Demonstration and Development Program successfully addressed certain market barriers by expanding public access to EVSE throughout its Washington service territory and across a diverse set of use cases. The program saw an overall steady increase in charging sessions each month, totaling over 10 MWh of energy delivered across almost 700 charging sessions. Guidehouse recommends that Pacific Power continue offering the Demonstration and Development Program in order to support statewide EV initiatives as well as continue addressing EVSE accessibility barriers throughout its Washington service territory. Pacific Power can use key findings from this evaluation to inform decisions about expanding the existing program or developing new offerings and services. Guidehouse developed a set of recommendations below for Pacific Power to consider.

1. **Improving Customer Survey Response Rates** – To gain more customer insight into the program and how it's addressing various market barriers such as high upfront cost and lack of awareness, Guidehouse recommends that Pacific Power conduct outreach activities notifying participants of upcoming surveys, providing customers multiple nudges through various touchpoints, and/or potentially offering rewards for fully completing surveys. Even though the program saw a 20% response rate to most of the survey questions, which is generally considered a good response percentage, the small population size (two to four respondents per question) may not be representative of the overall attitudes and behaviors of Pacific Power Washington customers.
2. **Integrate Outreach and Education into Grant Program More Conclusively** – Customers can also be reminded to increase awareness of EVSE through various education and outreach activities, shown the benefits of doing so, and provided templates and guidance.
3. **Customer Onboarding** – Out of the ten grant projects that had fully installed EVSE by the time of this report, three had not yet activated their data networks. To better expedite activating the EVSE for customers, Pacific Power Project Partners are encouraged to engage and onboard the Grant recipient leads early on and provide guidance on how to work with their EVSE vendors to install and activate their equipment.
4. **Continued Analysis of Charging Behavior** – Out of the 19 approved grant projects, seven grant projects were both operational and able to provide data. Pacific Power should consider reviewing data for the additional sites as well as additional data from the existing sites to gain additional insights into customer charging behavior.
5. **Creating Pre-Qualified Equipment List** – Pacific Power should consider establishing a pre-qualified list of eligible equipment and vendors for the Demonstration and Development program, or future incentive programs. This can ensure that Pacific Power has more reliable access to charging data and can also allow Pacific Power to select equipment that meets certain standards such as having capabilities to enable future managed charging programs. A predetermined list of options may be well-received by participants since it provides utility-vetted guidance on product selection.
6. **Make-Ready Solutions** – Pacific Power should consider whether a make-ready program model would be a viable addition or integration to the Demonstration and Development grant funding program model. Make-ready programs typically involve utility funding for the infrastructure needed to connect EV chargers to the grid (e.g. conduit, grid connection), but require the end customer to purchase the actual charging station hardware. This program model would still offset some costs for participants, while potentially allowing program funding to reach more customers.

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