Application of SAN DIEGO GAS & ELECTRIC COMPANY (U902-E) for Approval of SB 350 Transportation Electrification Proposals	Application No. _____ (Filed January 20, 2017)

PREPARED TESTIMONY OF

RANDY SCHIMKA

ON BEHALF OF SAN DIEGO GAS & ELECTRIC COMPANY

CHAPTER 3

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

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CHAPTER 3

I. OVERVIEW AND PURPOSE

San Diego Gas and Electric Company ("SDG&E") proposes six priority review transportation electrification ("TE") projects, consistent with the "Assigned Commissioner's Ruling Regarding the Filing of the Transportation Electrification Applications Pursuant to Senate Bill 350," dated September 14, 2016, in Rulemaking 13-11-007 ("ACR"). These projects are essential to TE efforts in the San Diego region and meet the following requirements for expedited review, as defined by the ACR:

- Non-controversial: The priority projects provide benefits for all ratepayers including, but not limited to, greenhouse gas ("GHG") emission reduction, local skilled labor employment, positive impact to disadvantaged communities ("DACs"), [1] and are not anti-competitive;
- Short term: All priority projects have a maximum duration of 1 year; and
- Budget: All priority projects do not surpass $4M in cost per project, nor does the total surpass the funding limit of $20M for each utility.

Upon approval from the Commission, SDG&E will commence implementation efforts to own and operate various types of electric vehicle supply equipment ("EVSE") in a variety of private and public venues and sponsor dealership incentives that will increase the sale of electric vehicles ("EV") in the area. This will, in turn, provide GHG emission reduction benefits,[2] allow

[1] DACs is defined consistent with D.16-01-045 and SDG&E Advice Letter 2876-E. *See* the direct testimony of Linda Brown (Chapter 2) for further details regarding the definition of DACs.
[2] *See* the direct testimony of J.C. Martin (Chapter 8) for further details.

grid integrated charging to occur via new grid-integrated electric rates,[3] provide sales growth for EV manufacturers and electric vehicle service providers ("EVSPs"), provide local skilled labor employment for installation and maintenance of charging equipment, and positively impact DACs with the installation and operation of local charging equipment. The six proposed priority review projects discussed in this chapter in the following order:

- Airport Ground Support Equipment ("GSE") Project
- Electrify Local Highways Project
- Medium Duty/Heavy Duty ("MD/HD") and Forklift Port Electrification Project
- Fleet Delivery Services Project
- Green Taxi/Shuttle/Rideshare Project
- Dealership Incentives Project

[3] *See* the direct testimony of Cynthia Fang (Chapter 5) for further details.

II. AIRPORT GSE PROJECT

A. Description and Features

1. Project Summary

Project Components	SDG&E's Airport Ground Support Equipment Project
Commission Review Mechanism	Priority Review
Objectives	Support and accelerate the conversion of airport GSE to electric, as well as data collection and analysis.
Market Segment and Vehicles Targeted	Commercial / Goods Movement; Addition of charging ports at airport and retrofit of a portion of existing chargers with metering and enabling technology for GSE. This will consist of up to 45 new charging ports and approximately 15 retrofits.
Vehicle Goals	Vehicle goal is an addition of 90 incremental electric GSE vehicles.
Implementation Timeframe	Installations will be started after CPUC approval, and data will be gathered and reported for one year after installation.
Project Partners	San Diego International Airport ("SDIA"), airline tenants such as Delta Airlines and American Airlines, and the IBEW.
Leveraged Funding	Environmental Protection Agency grants were previously pursued; airport tenants and/or airport will be responsible for procuring electric GSE.
Stranded Asset Mitigation	Partnerships and collaboration with SDIA and airline tenants will reduce the potential for stranded assets.
Grid Impacts	Use grid-integrated enabling technology to manage charging and to educate customers about charging during times of onsite solar generation at SDIA and/or to encourage charging during times that have minimal impact on the grid (i.e., overnight charging).
Emissions Benefits & Accounting Methodology	Estimated GHG reduction: 1174 $MTCO_2$/year[4]
CA Regulation Supported by Project	SB 32 SB 350 2016 ZEV Action Plan Executive Order B-30-15 Executive Order B-16-2012 San Diego County Regional Airport Authority Air Quality Management Plan Low Carbon Fuel Standard Climate Change Scoping Plan Diesel Risk Reduction Plan In-Use Off-Road Diesel Fueled Fleets Regulation

[4] *See* the direct testimony of J.C. Martin for further details.

CPUC Regulation Supported by Project	§740.3(a), (c) §740.8 §740.12
Monitoring and Evaluation Plan	Data collection will allow stakeholders to evaluate total kWh consumption by electric GSE by hour, assess grid needs, customer needs, bill impacts and GSE load.
Cost	Estimated Cost: $2.8M

2. Project Description

San Diego Gas & Electric's ("SDG&E") Airport Ground Support Equipment ("GSE") Project is intended to encourage, support and accelerate electrification of GSE at the San Diego International Airport ("SDIA"), also known as Lindbergh Field. SDG&E proposes to increase the number of electric GSE charging ports at SDIA by up to 45, as well as retrofit approximately 15 existing charging ports. The Airport GSE Project will help incorporate additional electric charging load from electric GSE in a manner that mitigates impacts to the grid.

This project will also include integration and utilization of SDIA's 5.5 Megawatt ("MW") photovoltaic ("PV") solar system to the fullest extent possible. A major component to this project is data collection and analysis by SDG&E to better understand GSE charging load patterns and support electric GSE, as well as the related impacts of conversion from internal combustion engine ("ICE") GSE equipment to electric GSE equipment.

3. Project Objectives, Market Segment, and Vehicles Targeted

From 2006 to 2014, the electric GSE fleet at SDIA has seen an increase, but the total growth has not increased at the rate that could be expected. The technical maturity and operational capabilities of electric GSE on the market allows for higher penetration than has been implemented at SDIA. The most recent electric GSE charging port was installed at SDIA was in 2013. SDG&E's proposed project removes the barriers of construction and electric GSE charger procurement from multiple airport tenants who operate at SDIA.

Upon the California Public Utilities Commission ("Commission" or "CPUC") approval, SDG&E will install, own, operate and maintain the necessary infrastructure and charging equipment, including the circuit, panel and charger, in order to integrate electric GSE charging equipment utilized by the airport and airport tenants efficiently to the grid. This work will be done with skilled labor affiliated with SDG&E and the International Brotherhood of Electrical Workers ("IBEW"). Electric GSE that will be supported by this project includes: baggage tractors, cargo belt loaders, pushback tractors, forklifts and other equipment, given market availability. SDG&E will also install load research meters and enabling technology, such as communicating chargers, to closely track consumption patterns and allow for future managed charging and grid integration.

This analysis of the data will also give new insights to current and future stakeholders who have an interest in adopting electric GSE. To the best of SDG&E's knowledge in working with SDIA, the impact of electric GSE is not fully known or understood. Upon collection of data, SDG&E will be able to better understand the increased load resulting from the adoption of electric GSE, the time of day of the additional charging load, and the appropriate ratio of charging ports to vehicles. With this analysis and knowledge, SDG&E can better collaborate with SDIA and airport tenants to operate and charge electric GSE at times that are beneficial rather than detrimental to local distribution circuits and the electric grid in general.

The key learnings from this project include a better understanding of the impact of electric GSE adoption through data collection and analysis and education of stakeholders interested in electrifying GSE. Data collection and analysis will allow stakeholders to better understand the ideal ratio of chargers to vehicles, the ideal time to charge vehicles in order to avoid on-peak charging, the potential need and areas for training of employees, and other

operational best practices. In addition, SDIA's onsite solar provides a unique opportunity to examine the interaction between onsite solar and electric GSE charging. Increased visibility of the impacts of electric GSE adoption will benefit all stakeholders. These key learnings will enable expansion beyond SDG&E's service territory.

4. Vehicle Goals

SDG&E proposes to install, operate, own and maintain up to 45 additional grid integrated GSE charger port installations consisting of metering, chargers and supporting infrastructure at SDIA. In addition, SDG&E proposes to retrofit approximately 15 existing charger ports with metering and enabling technology. Some of the current charging stations and ports may be replaced if they have limited functionality that prevents efficient access to charging data that can be analyzed. SDG&E will also upgrade the electric infrastructure to support the charger ports on an as needed basis.

The new chargers and infrastructure, as well as the existing charger retrofits, will allow for the introduction of new features such as data collection. This provides a pathway to future grid integrated charging of electric GSE and supports growth of the fleet of electric GSE. The 45 new charger ports will allow for charging of approximately 90 new pieces of electric GSE equipment. In total, the retrofitted and new chargers will provide support for approximately 210 pieces of electric GSE at SDIA.

The added infrastructure and charging ports will support GSE including baggage tractors, cargo belt loaders, pushback tractors and forklifts. SDG&E and SDIA have collaborated on this proposal to allow for greater access to electric GSE charging equipment throughout the airport. SDG&E and SDIA have had a number of productive conversations with airport tenants such as FedEx, American Airlines and Delta Airlines, all of which have expressed interest in increasing the number of electric GSE that they operate at SDIA.

5. Project Architecture

SDG&E will utilize a combination of chargers, metering and enabling technology to advance grid integration of additional electric GSE. Figure 3-1 below shows an illustrative example of airport GSE charging equipment architecture. The load research meter proposed for this project will measure just the electric vehicle charging loads, which will not include the non-charging load on the main meter / switchgear.

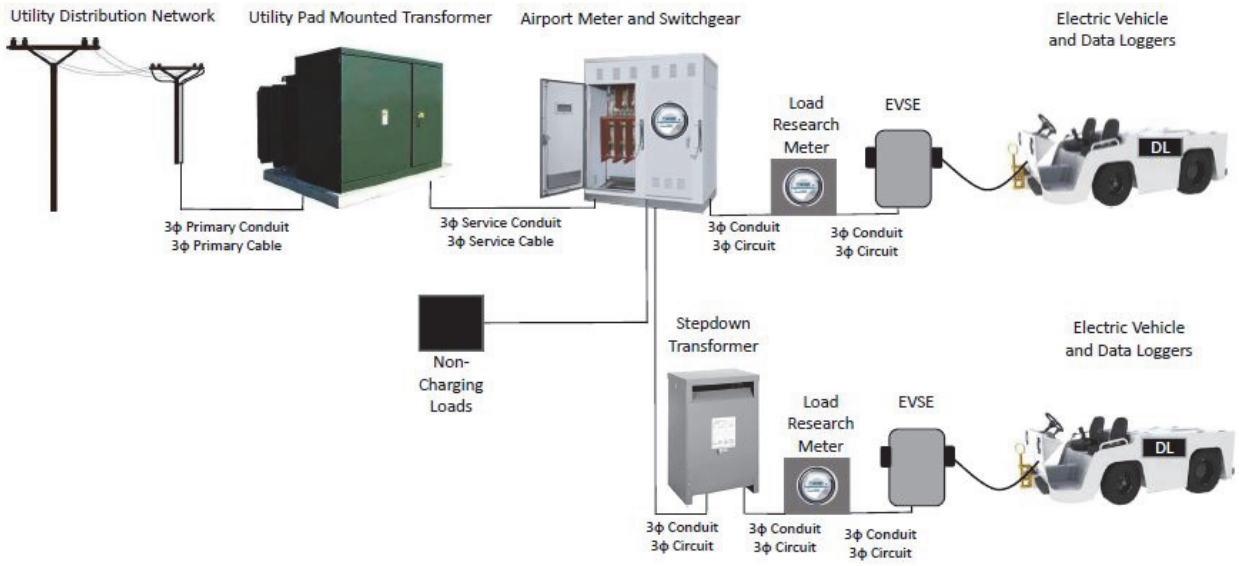

Figure 3-1: Airport GSE Architecture Showing Billing Meter and Load Research Meter

6. Implementation Timeframe

SDG&E will install the infrastructure and chargers upon Commission approval. Data collection will continue for one year from the time that the charging ports are installed and operational.

SDG&E will manage the charging port installations in a manner that coincides with commitments to incremental electric GSE by airport tenants while also balancing the cost reductions of installing ports simultaneously to benefit from economies of scale.

7. Project Partners

SDIA, which is owned and operated by the San Diego County Regional Airport Authority, serves over 20 million passengers annually in close coordination with the 16 passenger carriers and three cargo carriers operating at the airport. SDIA is considered an environmental leader in the region and aviation industry. Based upon conversations with SDIA, SDG&E has learned that SDIA was one of the first U.S. airports with a formal sustainability policy, committing to holistically address economic viability, operational efficiency, natural resource conservation, and social responsibility.

SDIA's strategies to improve local air quality and reduce greenhouse gas emissions were summarized in an Air Quality Management Plan in 2009.[5] As expressed by SDIA, they have worked to retrofit buildings with more energy efficient technologies, install renewable energy systems onsite, and convert fleet and ground transportation vehicles to alternative fuels. In 2016, SDIA became one of only 20 North American airports certified through the Airport Council International's Airport Carbon Accreditation program for proactively managing and successfully reducing its carbon emissions (Level 2).[6] Level 2 accreditation is achieved after mapping the carbon footprint and then conducting carbon management.

During SDG&E's collaborations with SDIA it was reported that SDIA representatives serve on numerous environmentally-focused committees including the San Diego Regional Climate Collaborative, San Diego Clean Cities Coalition, California Airports Council's Environmental Working Group, and the Airport Council International's Environmental Affairs Committee.

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[5] San Diego County Regional Airport Authority, Air Quality Management Plan (November 2009), http://www.san.org/Portals/0/Documents/Environmental/SAN%20AQMP%20Draft%20Final%20Report.pdf.

[6] Airport Carbon Accreditation, http://airportcarbonaccreditation.org/airport/participants/north-america.html.

SDIA has been a supportive partner from the onset. They have participated in a number of meetings with SDG&E and collaborated on refining the Airport GSE Project. They have also assisted in engagement of airport tenants and assisted in arranging meetings. SDIA's involvement will increase confidence by airlines and subcontractors that the support of electric GSEs will continue and allow more rapid electric GSE deployment.

SDG&E has also engaged in conversations with airport tenants, including FedEx, American Airlines and Delta Airlines. Many tenants are interested in exploring the addition of electric GSE at SDIA, and conversations are on-going. As part of this project, SDG&E will continue to collaborate with SDIA and airline tenants to support and accelerate conversion to electric GSE.

8. Leveraged Funding

SDG&E will collaborate with and/or partner with SDIA, as appropriate, to seek additional funding sources. Recently, SDIA and United Airlines applied for grant funding through the Federal Environmental Protection Agency ("EPA") to convert a portion of United's GSE from ICE to electric. The project was titled "San Diego International Airport Diesel-to-Electric Ground Support Equipment (GSE) Replacement Program." Unfortunately, the grant was not awarded to SDIA and United Airlines. However, SDG&E will continue to seek out available grants that can help accelerate the conversion to all electric GSE.

9. Stranded Asset Mitigation

The possibility of stranded assets will be mitigated due to early and regular collaboration between SDG&E, SDIA and airport tenants. SDG&E will conduct a measured roll-out of charging ports and infrastructure based upon electric GSE procurement commitments while balancing cost reductions from economies of scale. If any of the designated load research meters are not used for this project, they can be easily re-deployed for metering needs elsewhere.

In addition to a measured roll-out funded by the project, it should be noted that some electric GSE is already installed at SDIA. The current and incremental charging stations will be used by the existing GSE even if no additional electric GSE is added. The existing charging station assets are expected to be utilized and will result in incremental electric GSE adoption, but this project will accelerate electric GSE adoption, fund deployment of additional GSE charging equipment and provide more valuable data than what is currently available.

B. Project Benefits

1. Grid Impacts

As of October 2016, there were approximately 50 existing electric vehicle charging ports at SDIA for GSE. SDIA's 2014 GSE Inventory counted 540 total pieces of equipment.[7] Of those, approximately 120 electric units included baggage tractors, cargo belt loaders, pushback tractors and forklifts.[8] SDG&E has worked with SDIA over the years to review the GSE growth and to understand energy usage from GSE, but the data is lacking granularity in certain areas. Currently, with chargers that can store data, it must be pulled manually before it gets overwritten.

SDG&E will collaborate with the airport and airport tenants to integrate the increased load resulting from electric GSE. Optimal integration will vary depending on the lease relationship between SDIA and the airport tenant, but the overall goal will be to minimize impacts to the distribution grid. This will be achieved through load management plans, which might be specific to an airport tenant or to SDIA as a whole. In addition, SDIA's 5.5 MWs of onsite solar PV provides a unique opportunity to incorporate renewable energy and will be a significant consideration when creating the load management plan.[9]

[7] Proprietary SDIA Data (2014).
[8] *Id.*
[9] CleanTech San Diego website reference to SDIA solar PV system, http://cleantechsandiego.org/portfolio_page/san-diego-county-regional-airport-authority/.

The load management plans will provide a framework for coordination between SDG&E, SDIA and airport tenants. The plans will address operational needs and encourage charging of electric GSE during times that are beneficial to the airport and the distribution grid. This will encourage charging when load on the grid is lower or when solar generation at SDIA is high in order to reduce the need to invest in new generation and/or distribution system assets.

SDG&E will explore the use of a future grid integrated rate that when coupled with enabling technology to allow the airport and airport tenants to respond to local and broader grid conditions.

Another opportunity related to airport GSE electrification that could provide additional benefits to the grid and ratepayers relates to SDIA's general hours of operation. SDIA's operations are limited during the midnight to 4:00 a.m. time period. As a result, there are opportunities for shifting GSE charging load to this time that would result in cost savings and less grid impacts, as well as make room for additional GSE load without affecting the overall peak at SDIA.

2. Ratepayer Interest

SDG&E ratepayers will benefit through cleaner air, reduced GHG emissions and increased grid optimization. SDIA is located in very close proximity to both residential and commercial electric customers. Of note is SDIA's close proximity to downtown San Diego. Residents of downtown San Diego and surrounding neighborhoods will benefit from GHG emission reduction at SDIA.

The installation of charging equipment, metering and enabling technology will provide data that does not currently exist. Insights gleaned from this data will help integrate future electric GSE in a manner that mitigates impacts to the distribution grid and reduces the need for new generation or distribution assets.

3. Emissions Benefits and Accounting Methodology

This project will support approximately 90 new pieces of electric GSE equipment. Using an estimated mix of belt loaders, baggage tractors, push back tugs and forklifts. First year reductions of 1,174 metric tons of CO_2 are estimated, resulting in lifetime net CO_2 reductions of 25,130 metric tons.[10]

C. Regulation Supported by Project

1. California Agency Regulation Supported by Project

The Airport GSE Project aligns with the goals of the Air Quality Management Plan ("AQMP") prepared by the San Diego County Regional Airport Authority ("SDCRAA") for San Diego International Airport. The AQMP assists SDCRAA in meeting local, state and federal air quality regulations and contributes valuable data and analysis to the San Diego region.[11] The AQMP includes several integral components including analysis of potential air emission reduction opportunities and analysis of ground-based aircraft movement greenhouse gases. Because GSE is idle for extensive lengths of time, they contribute to the overall emissions levels produced by the operation of the airport.[12]

A proposed California Air Resources Board ("CARB") measure could encourage transition to electric GSE through incentives.[13] CARB could also require conversion of GSE to zero-emission technology without offering incentives. This CARB measure may be adopted in 2018 with implementation in 2023. SDG&E's immediate proposal will help accelerate adoption

[10] *See* the direct testimony of J.C. Martin (Chapter 8) for further details.
[11] San Diego County Regional Airport Authority, Air Quality (click on Environmental Affairs link, and then Air Quality tab), http://www.san.org/Airport-Projects/Environmental-Affairs#124540-air-quality.
[12] *Id.*
[13] California Air Resources Board, Mobile Source Strategy (May 2016), p. 139, https://www.arb.ca.gov/planning/sip/2016sip/2016mobsrc.pdf.

and utilization of electric GSE in the near term and will help support the proposed CARB measure if adopted.

SDG&E's proposed project will also support the Low Carbon Fuel Standard ("LCFS"). The LCFS is a regulation designed to reduce GHG emissions associated with the lifecycle of transportation fuels used in California. CARB adopted the LCFS regulation in 2009 to reduce the carbon intensity of transportation fuels by at least 10 percent by 2020.[14] The partners in this project are not bound by the regulation due to the fact that they are not producers and importers of finished fuels such as gasoline or diesel fuels. However, they can still assist this regulation by helping to create a robust market if they choose to participate.

2. CPUC Regulation Supported by Project

The Airport GSE Project supports a number of CPUC regulations. The project supports Public Utilities Code §740.8 in that the project aims to increase utilization of the grid, incorporate SDIA's onsite solar PV system and promote renewables, reduce health and environmental impacts from air pollution, and reduce GHG emissions. Further, the project supports Public Utilities Code §740.12. The project will reduce petroleum use, help achieve the goals of the Charge Ahead California Initiative, and help reduce emissions of GHGs while improving air quality. The project also supports §740.3(a) since SDG&E, as an electrical corporation will evaluate and implement policies to promote the development of equipment and infrastructure needed to facilitate the use of electric power; and §740.3(c) since it is considered in the ratepayers' interest and will not unfairly compete with nonutility enterprises.

[14] *See* https://www.arb.ca.gov/fuels/lcfs/lcfs.htm in the "Information About" section under the "Background information" tab.

D. Monitoring and Evaluation Plan

Monitoring and evaluation is a key part of SDG&E's proposal. Increased visibility of the impacts of electric GSE adoption will benefit all stakeholders. Data collection and analysis will allow stakeholders to better understand the ideal ratio of chargers to vehicles, the ideal time to charge vehicles in order to avoid on-peak charging, the potential need and areas for training of employees, and other operational best practices.

SDG&E has periodically collaborated with SDIA and its primary charger vendor to examine data from a portion of the existing chargers. The limited available data provided preliminary insight into the frequency of vehicle charging, consumption and information on when the battery was connected and disconnected to the charging port for some of the vehicles. Results indicated that many of the batteries were being run too low and not being sufficiently charged. In addition, more charging could have occurred during off-peak periods. Non-optimized charging behavior can negatively impact electric costs and result in higher demand charges. A load management plan, including training, and the addition of enabling technology will help to mitigate these issues. While this preliminary data provided some limited insight, it was not granular enough, and it was not consistently or periodically collected to provide more robust results.

As part of the Airport GSE project, data will be gathered in order to inform future electrification of airport GSE in San Diego and at other airports. SDG&E will track and monitor metrics in order to effectively integrate additional load from electrification of GSE. Metrics include total kilowatt-hour ("kWh") consumption by electric GSE by hour, grid needs, customer needs, bill impacts and GSE load. The metering that SDG&E has proposed as part of this project will collect this data for analysis. The use of smart chargers capable of identifying specific GSE will allow for additional analysis.

SDG&E will collaborate with SDIA and airport tenants to examine the data and create a report. Lessons learned from the project should ideally be transferrable to other airports and similar transportation hubs. Knowledge transfer can also occur from airport authority to airport authority as well as by organizations (e.g., FedEx, United, Delta) that have a presence in numerous airports.

E. Future Opportunities/Scalability

The current California population estimate of internal combustion powered GSE is greater than 10,000.[15] The addition of zero-emission GSE will act as a catalyst to further zero-emission equipment penetration in the off-road equipment sector and other heavier duty-cycle and longer range applications.[16]

The immediate opportunity for electric GSE consists of currently available electric options, including baggage tractors, cargo belt loaders, pushback tractors and forklifts. In the mid to long-term, those same pieces of equipment will become more effective with the proliferation of next generation batteries. Furthermore, it is expected that box trucks, cargo and passenger vans and small trucks will have increased availability with electric options.

Implementation of this project in collaboration with SDIA has the potential to lead to additional projects with SDIA to help reduce GHG emissions and improve air quality related to airport operations. As a transportation hub, there are likely additional transportation electrification opportunities upon which to collaborate and to further build upon the partnership between SDG&E and SDIA.

[15] California Air Resources Board, Mobile Source Strategy (May 2016), p. 138, https://www.arb.ca.gov/planning/sip/2016sip/2016mobsrc.pdf.
[16] *Id*. at 139.

F. Education and Outreach

SDG&E will collaborate with SDIA on the best way to educate its employees and stakeholders about how the airport is taking steps at all levels of its organization to support clean air quality policies and use the GSE project as a way to demonstrate this effort. In addition, a comprehensive training program for employees using the equipment can demonstrate safe and easy operation of the GSE and its charging stations, as well as demonstrate the importance of using grid-integrated technology to mitigate both bill and grid impacts. The airport will also be able to share its best practices with other airports and other commercial and industrial companies about the best way to implement this technology and the benefits of growing electric fleets at all levels of an organization. Emphasizing safety, electric charging protocols and discussing the overall benefits of electrification will be a key focus of this project's education and outreach efforts.

G. Estimated Project Costs

The estimated cost of SDG&E's Airport GSE project is $2.8M. See Appendix A, Table GSE-1, for additional cost estimate details.

H. Conclusion and Summary

The Airport GSE project will assist the airport in reducing local GHG emissions by integrating onsite renewable generation and accelerating the electrification of GSE fleet. SDG&E respectfully requests that the Commission expeditiously review and approve the project as proposed. SDIA has shown a strong commitment and collaborative approach towards GHG reduction. They have been involved in meetings early on in the process and have helped coordinate meetings with airport tenants. Commission approval of this project will allow for more rapid electrification of GSE, reduce air pollution in communities near the airport, and the

partnership will allow SDG&E and stakeholders to better understand and plan for the integration of electric GSE.

In addition, the project meets the requirements set forth in the ACR. Specifically, the project is non-controversial in that it is relatively minor in scope and has a strong emphasis on data collection. Data collection and analysis will inform all market participants and enable the market. Second, the project is short term, will be deployed reasonably quickly and will not oversaturate the market. Finally, it is within the budget parameters to qualify for priority review.

III. ELECTRIFY LOCAL HIGHWAYS PROJECT

A. Description and Features

1. Project Summary

Project Components	SDG&E's Electrify Local Highways Project
Commission Review Mechanism	Priority Review
Objectives	Provide EV charging infrastructure at four Park-and-Ride locations.
Market Segment and Vehicles Targeted	People movement; L2 and DCFC EVSE; light-duty passenger vehicles (approximately 30 cars / day / site).
Vehicle Goals	Install grid-integrated public charging at four Park-and-Ride locations - 20 L2 charging stations and two DCFC at each site.
Implementation Timeframe	Installation will commence after CPUC approval, and charging data will be collected and analyzed for one year.
Project Partners	Caltrans to provide land easement, parking spaces, and expertise to help streamline the design, installation and permitting efforts. SANDAG to provide support as part of their San Diego Regional PEV Readiness Plan. Contractors to provide IBEW-trained skilled labor. EVSP to provide EVSE and network capabilities.
Leveraged Funding	Caltrans to provide land easement, parking spaces, and expertise to help streamline the design, installation and permitting efforts.
Stranded Asset Mitigation	SDG&E ownership and maintenance assures reliable charging equipment and L2 EVSE is standardized.

Project Components	SDG&E's Electrify Local Highways Project
Grid Impacts	Use grid-integrated rate technology (public grid-integrated rate) to incentivize drivers to charge at times of the day when the grid is impacted the least.
Emissions Benefits & Accounting Methodology	GHG Emission Reductions: 155 $MTCO_2$/year[17]
CA Regulation Supported by Project	SB 32 SB 350 2016 ZEV Action Plan Executive Order B-30-15 Climate Change Scoping Plan California Transportation Plan 2040 Executive Order B-16-2012
CPUC Regulation Supported by Project	§740.3(a), (c) §740.8 §740.12
Monitoring and Evaluation Plan	Monitor usage data to study charging patterns at long-duration, public locations. Test hourly grid-integrated pricing in the public domain. Test standards set for public charging signage, rate display and general retail electric vehicle fuel dispensers. Data will be shared with CPUC and other stakeholders.
Cost	Estimated Cost: $4M

2. Project Description

As part of the Electrify Local Highways Project, San Diego Gas & Electric ("SDG&E") proposed to partner with California's Department of Transportation ("Caltrans") and install Level 2 ("L2") and DC fast chargers ("DCFCs") at four Caltrans-owned Park-and-Ride locations.

As one of the state agencies charged with helping to implement the Governor's Executive Orders B-30-15 and B-16-2012, Caltrans is mandated to facilitate the rapid commercialization of zero-emission vehicles ("ZEV"). As part of Caltrans' 2016 Sustainability Implementation Action Plan, the organization determined the installation of electric vehicle (EV) charging

[17] *See* Testimony of J.C. Martin (Chapter 8) for further details.

stations on Caltrans-owned Park-and-Ride facilities is one of their top sustainability priorities.[18] The 2016 Governor's ZEV Action Plan specifically tasks Caltrans with installing DCFCs at a minimum of 30 of their locations throughout the state by the end of 2018.[19] Based on information provided to SDG&E by Caltrans, one of the key EV charging issues they are looking to solve is finding the best way to implement an ongoing operations and maintenance plan for the stations. Caltrans conveyed they do not currently have the resources to take on this effort themselves, and that they have not been able to find the right end-to-end solution with past third-party charging installation programs, which could take on the installation, ownership, customer service, billing, maintenance, and operations efforts altogether.

Caltrans also said during discussions on their charging efforts that with their existing Del Lago Park-and-Ride in Escondido, the only Caltrans-owned location currently with charging, they found: (1) drivers often park their cars for up to 11 hours at a time while they take mass transit or carpool to continue their trip; (2) their DCFC charges approximately five cars per day; and (3) they do not want to be in the business of owning, operating and maintaining EV charging stations. Caltrans explained that for these reasons they think their Park-and-Ride locations are good for both long-duration parking and charging, quick stops for DCFC use, and that a third party end-to-end solution could be the best option to provide a positive customer experience.

During collaboration on their charging needs, it was determined that Caltrans would like to install EV charging at four other Park-and-Ride sites, but currently does not have a capital project in place that would authorize funding for such an end-to-end solution. As part of this collaboration, Caltrans determined they could, however, provide land easements, parking spaces,

[18] Caltrans Sustainability Implementation Action Plan, First Edition, (2016), p. 3, http://www.dot.ca.gov/sustainability/docs/2016_Sustainability_Implementation_Action_Plan_First_Ed_092016.pdf.
[19] 2016 ZEV Action Plan, p. 27, https://www.gov.ca.gov/docs/2016_ZEV_Action_Plan.pdf.

and expertise to help streamline the design, permitting and installation efforts at four of their top priority Park-and-Rides – most of which Caltrans is looking to renovate over the next 12 to 18 months.

3. Project Objective, Market Segment, and Vehicles Targeted

SDG&E intends to partner with Caltrans to implement the Electrify Local Highways Project, which will provide EV charging infrastructure to four Park-and-Ride locations. SDG&E would install, own, maintain, and operate the charging stations (including billing), while Caltrans would provide the parking spaces, easements and expertise to streamline the design, permitting and installation efforts – thus helping to reduce the overall project cost.

SDG&E will study charging patterns and share the usage data for modeling charging infrastructure at future park-and-rides. SDG&E will also test hourly grid-integrated pricing in the public domain, as well as test the standards for public charging signage, rate display, and general retail EV fuel dispensers. This will be the first time that SDG&E will test how to easily communicate a dynamic hourly rate to the public at a charging station.

Park-and-Rides are locations where drivers leave their cars in designated parking lots and travel to their destination via public transportation or carpool. Park-and-Rides are a system for reducing urban traffic congestion, increasing mobility options, and decreasing GHG and air pollution associated with transportation.[20] Caltrans, the owner of the four proposed Park-and-Ride locations, is responsible for the design, construction, maintenance and operation of the California State Highway System, as well as the portion of the Interstate Highway System within the state's boundaries. Each of the Park-and-Rides included in this project are located along major freeways within SDG&E's territory, as well as within or adjacent to DACs.

[20] California Department of Transportation, Park and Ride Program Resource Guide (2010), p. 1, http://www.dot.ca.gov/trafficops/tm/docs/Park_and_Ride_Program_Resource_Guide.pdf

Caltrans supports more than 60 Park-and-Rides in the San Diego region, and owns 33 of these locations.[21] At this time, only one of the 33 Park-and-Rides (Del Lago) currently offers charging for EV drivers. After analyzing the charging station usage from this location, Caltrans reported that they would like to move forward and have additional EV charging stations installed, owned, operated, maintained and billed by a third party at other locations in San Diego. Upon approval of this project, SDG&E will work with EVSPs to purchase the EVSE and the network services, and then work with skilled IBEW-affiliated contractors for the installation and maintenance of the charging equipment. SDG&E will install, own, operate and maintain the charging stations (including billing), similar to SDG&E's Vehicle-Grid Integration Pilot Program, approved by the CPUC in February 2016.[22] As the owner, SDG&E will provide the same standard of service that it does to all other assets installed in its territory.

4. Vehicle Goals

SDG&E proposes to install EV charging stations at each of the four Caltrans Park-and-Ride locations selected. The charging equipment will consist of twenty L2 charging stations and two DCFC stations at each site that are compatible with the CHAdeMO and Combined Charging System ("CCS") standards.

SDG&E's estimate of vehicle usage for each Caltrans site is one charge per day for L2 charging stations, and 5 charging sessions per day for each of the DCFC stations, which is a total of 30 vehicles charged per day per site.[23]

Of the 33 state-owned Park-and-Ride locations, Caltrans has prioritized four ideal locations for this project, each located within or adjacent to a DAC. The proposed sites include:

[21] California Department of Transportation, Park-and-Ride Inventory (2016), http://www.dot.ca.gov/trafficops/tm/docs/Park-Ride-Inventory.pdf
[22] D.16-01-045.
[23] *See* the direct testimony of J.C. Martin (Chapter 8) for further details.

(1) Pala: Located across the freeway from a large DAC at the North West Corner of the I-15 freeway and Highway 76 in northeastern San Diego county; (2) Oceanside Transit Center: Located across the street from a DAC at 235 South Tremont Street in Oceanside (northwestern San Diego county); (3) National City: Located within a DAC at 2300 Sweetwater Road in National City (just south of downtown San Diego); and (4) Chula Vista: Located on Palomar Street within a DAC off the I-805 freeway in Southern San Diego county.

In 2015, Caltrans formed an internal Sustainability Technical Advisory Committee on ZEVs to assess the needs of providing charging infrastructure to EV drivers at their statewide Park-and-Ride locations and build a charging network for the cars.[24] Of the 33 state-owned Park-and-Ride locations within the SDG&E territory, Caltrans prioritized all four proposed locations in this project for redevelopment as part of their collaboration with SDG&E. Currently, public charging is lacking in the areas it is needed most: DACs, long-term parking lots, and underserved lots located outside of main city centers. During SDG&E's collaboration with Caltrans, it was conveyed that additional research performed by Caltrans' Sustainability Technical Advisory Committee on ZEVs determined all charging stations at their Park-and-Ride locations must be: (1) public, due to their charter of serving both residents and visitors; (2) accessible by anyone with a credit card and operate under the Electric Vehicle Charging Stations Open Access Act;[25] and (3) allow for drivers to park for long durations (for commuters) or for drivers to get a fast charge (for trip continuation).

[24] Caltrans Sustainability Implementation Action Plan, First Edition (2016), p. 20, 22 and 28 http://www.dot.ca.gov/sustainability/docs/2016_Sustainability_Implementation_Action_Plan_First_Ed_092016.pdf.

[25] Senate Bill 454, Chapter 418, Section 2.

5. Project Architecture

SDG&E will install new distribution transformers at the four sites, as each location does not have enough electrical infrastructure to serve the proposed number of charging stations. A new electric service will be installed at each site that is separately metered, and it will feed the twenty L2 charging stations and two DCFCs.

SDG&E will issue a RFP and contract with a third-party EVSP to provide the networked EVSE and operating system. SDG&E will contract with one EVSP to provide this equipment and service for the four sites. SDG&E will use IBEW-trained skilled labor to install the charging stations, and SDG&E will install, own, operate, and maintain the charging stations.

EV drivers will be able to pull into the Park-and-Ride lots and choose their charging scenario, either L2 or DCFC. The charging stations will accommodate two different types of drivers: (1) those commuters who leave their cars for a longer period of time to charge while using another form of transportation to continue to their destination, and (2) those who wish to use a DCFC to quickly charge their vehicles prior to continuing on their trip.

In an effort to minimize negative impacts on the grid, the charging stations will use an grid integrated rate that incentivizes drivers to charge at times of day when the price of electricity is at its lowest.[26]

As part of the research effort done by the Sustainability Technical Advisory Committee on ZEVs, Caltrans requires charging stations that provide full open access to the public by allowing EV drivers a variety of payment options: credit card/debit card, mobile device, SDG&E bill, etc. This will allow the stations to be available to infrequent visitors as well as those who use the charging stations every day. The prices will be displayed within the EVSE or the corresponding smart phone software application.

[26] *See* the direct testimony of Cynthia Fang (Chapter 5) for further details regarding rates.

The customer experience at these charging stations will be a key focus. Hourly pricing will be prominently displayed within each EVSE or via the smart phone software application. Customers will have the option to pay by credit card, which will be beneficial for visitors who do not use the lot daily; or if they use the lot to commute, the customer might prefer to pay the charging costs on their monthly SDG&E bill.

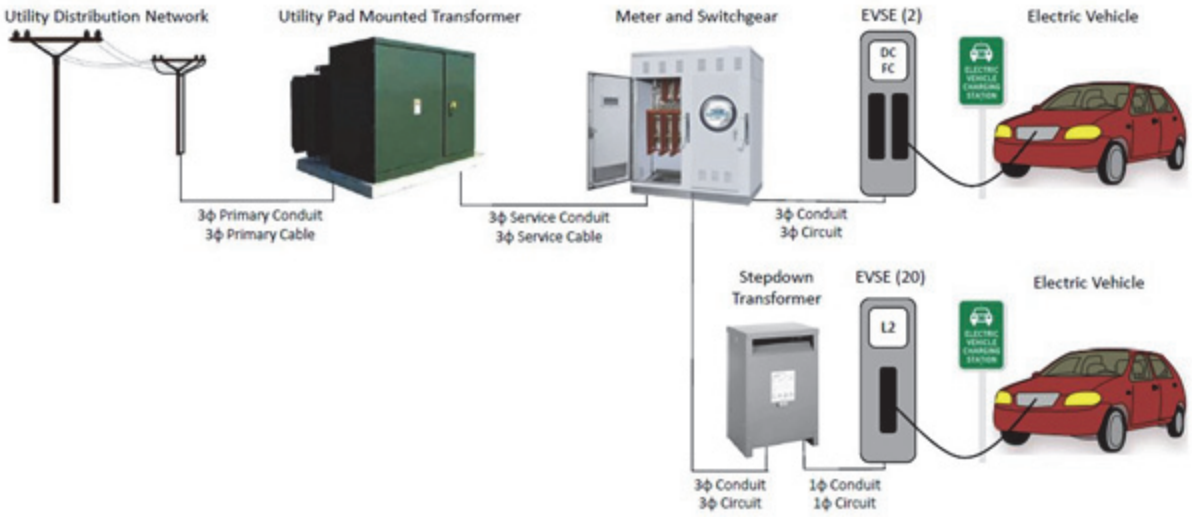

Figure 3-2: EV Charging Station Architecture at Park-and-Ride Sites

Figure 3-2 above depicts the EV charging station architecture at each Caltrans Park-and-Ride site. A new separately metered electric service will be installed to feed the charging stations. SDG&E will be the customer of record for this new service, and will bill drivers for their charging session energy.

6. Implementation Timeframe

SDG&E will install the infrastructure and chargers upon Commission approval. Data collection will continue for one year from the time that the charging stations are installed and operational.

7. Project Partners

Caltrans, the owner of the four Park-and-Ride locations, will provide the land where the infrastructure will be located. As part of their scheduled renovation work at these sites, Caltrans has agreed to provide the parking spaces, easement and expertise to streamline the design, permitting and installation efforts.

SANDAG is made up of 18 cities and the San Diego County government. This public agency serves as the forum for regional decision-making in regards to growth, transportation, environmental management, housing, open space, air quality, energy, fiscal management, economic development, and public safety.[27] Both Caltrans and SANDAG are voting members of the San Diego Regional Electric Vehicle Infrastructure Group and worked together along with many regional partners to develop the San Diego Regional Plug-In Electric Vehicle Readiness Plan.[28] Caltrans has been coordinating with SANDAG on their Park-and-Ride restoration and EV charging efforts,[29] therefore SANDAG is a natural fit to be a supporting partner on this project.

The IBEW will also be a partner, providing training for the skilled labor necessary to install and maintain the charging stations for this project.

SDG&E will utilize an open RFP process to procure charging stations and grid-integrated managed charging and control functions from a single qualified EVSP for these four sites, and then outsource the installation and maintenance of the stations to one or more third-party contractors. As part of the EVSP contract, SDG&E will select a partner that can provide the grid-integrated managed charging and control functions, as well as meet other project

[27] San Diego Association of Governments, http://www.sandag.org/.
[28] San Diego Regional Plug-In Electric Vehicle Readiness Plan (January 2014), Acknowledgments, https://energycenter.org/sites/default/files/docs/nav/programs/pev-planning/san-diego/San_Diego_PEV_Readiness_Planning_Guide-2013_low-resolution.pdf
[29] *Id.* p. 27.

requirements, such as communicating rates to drivers, provide managed EV charging, provide credit card billing services, or send charging consumption data to SDG&E for customer home energy billing (if that option is chosen).

There are also numerous environmental justice community partners in SDG&E's service territory supporting our local underserved community. Many of these nonprofit groups, like American Lung Association, Wildcoast, I Love A Clean San Diego, Cleantech San Diego, Plug In America, Electrical Workers Minority Caucus, Kidsecoclub, GRID Alternatives, San Diego Regional Climate Collaborative, Living Coast Discovery Center, Circulate San Diego, San Diego Green Building Council, San Diego Coastkeeper and Climate Science Alliance have participated in SDG&E's $7.5M shareholder-funded grant program that supports groups to help the region grow EV education in their communities. Many of these partners have stakeholders and members in the areas where these Park-and-Ride sites are located, so SDG&E can leverage the EV education and outreach efforts already taking place in these communities.

8. Leveraged Funding

At one of the four Park-and-Ride sites (Pala), Caltrans has already started construction to expand and renovate the site. At the other three sites, Caltrans will work with SDG&E to develop a collaborative installation and operation plan that minimizes costs. SDG&E has included all the construction costs in the project budget, with Caltrans agreeing to provide the land, easement and expertise to streamline design, installation and permitting efforts.

9. Stranded Asset Mitigation

Utility ownership of charging infrastructure will help ensure that these assets are used and useful. SDG&E will ensure that the charging facilities are reliably operated and maintained,

minimizing the risk that charging infrastructure will be put out of service.[30] Furthermore, with the current charging station usage data from the Del Lago Park-and-Ride site that demonstrates cars are parked for long durations and the DCFC is used approximately five times a day, and considering the strategic locations chosen to have additional charging equipment installed as part of this project, Caltrans and SDG&E believe that for these reasons the risk of stranded assets as part of this project risk is minimal. Charging station usage and energy consumption data will be collected and reported to verify that the assets are used and useful.

B. Project Benefits

1. Grid Impacts

SDG&E plans to use a grid-integrated rate to incentivize drivers to charge at times of the day when the grid is impacted the least. To make this easy for EV drivers, they will be able to set a maximum price they want to pay per kWh and the charging stations will deliver the required charge as inexpensively as possible (up to the maximum price). This grid-integrated technology is a key component for this project to support Governor Brown's ZEV Action Plan, while providing EV drivers an incentive to charge during off-peak hours and ensure the grid can

[30] Reputation and branding can be significant in changing the public perception of EVs. The local utilities have the reputation to deliver safe and reliable service. Recent failures in an attempt to advance the TE market illustrate that a different approach is needed. Car2Go, a fleet of clean EV cars in San Diego, failed in just five years, claiming setbacks in electric charger stations as one of the reasons.(http://www.sandiegouniontribune.com/news/politics/sd-me-car2go-leaves-20161118-story.html) ECOtality, the original operator of the Blink charging network, went bankrupt and the Blink network was taken over by Car Charging Group. The Blink residential and public chargers were initially provided as part of a DOE EV grant. ECOtality's public financial reports have revealed its inability to build a business beyond the DOE funded chargers which led to DOE freezing further grant payments. One survery conducted by Recargo indicated that only 48 percent considered the Blink brank "reliable" and only 18 percent felt "loyal" to the brand. (https://www.greentechmedia.com/articles/read/ECOtality-Bankruptcy-Blink-EV-Charging-Network-Changes-Hands-But-Not-Bad-R)

support the influx of new load from EVs and mitigate the need for new generation or transmission & distribution (T&D) assets.[31]

2. Ratepayer Interest

With a variety of EVs now available on the market, the decreasing costs of EVs, the increasing battery capacity, and more used cars entering the market as EV drivers return vehicles from leases, electric transportation choices are growing. This project will provide new charging infrastructure in or adjacent to DAC areas that will be available to residents and visitors alike and ultimately will extend their electric miles traveled.

Of the 33 Park-and-Ride locations owned by Caltrans, only one location (Del Lago) offers charging for EV drivers. At this location in North San Diego, Caltrans contracts with the EVSP Car Charging Group for four L2 and one CHAdeMO DCFC. Usage at the Del Lago DCFC indicates: (1) customers charge to 86 percent of their battery during each session; and (2) the DCFC equipment receives about five uses per day.[32] With this usage, both Caltrans and SDG&E believe there is a need for other Park-and-Ride locations to be equipped with EV charging stations to enable more electric miles traveled.

3. Emissions Benefits and Accounting Methodology

GHG reductions from the Electrify Local Highways project provide air quality benefits for all ratepayers. First year reductions of 155 MT of CO_2 are estimated, resulting in lifetime net CO_2 reductions of 2,663 MT for the vehicles included in the Electrify Local Highways project.[33]

[31] 2016 ZEV Action Plan, https://www.gov.ca.gov/docs/2016_ZEV_Action_Plan.pdf
[32] Research performed by the Caltrans Electric Vehicle Charging Committee.
[33] *See* the direct testimony of J.C. Martin (Chapter 8) for further details.

C. Regulation Supported by the Project

1. California Agency Regulations Supported by the Project

The Electrify Local Highways project will support a variety of California regulation in addition to SB 350, such as:

- AB 32: Reduction of GHG emissions to approximately 15% below emissions expected under a "business as usual" scenario;[34]
- 2016 ZEV Action Plan: 1.5 million ZEVs in California by 2025;[35] and
- Executive Order B-30-15: Decrease GHG emissions to 40% below 1990 levels by 2030 and 80% below 1990 levels by 2050.[36]

2. CPUC Regulations Supported by the Project

The Electrify Local Highways project also supports the following CPUC Regulation:

- Public Utilities Code §740.3(a) and (c): SDG&E, as an electrical corporation, will evaluate and implement policies to promote the development of equipment and infrastructure needed to facilitate the use of electric power and this project is in the ratepayers' interest and will not unfairly compete with nonutility enterprises.
- Public Utilities Code §740.8: the project will increase the use of alternative fuels and reduce the health and environmental impacts from air pollution.
- Public Utilities Code §740.12: the project stimulates innovation and competition by EV manufacturers, attracting more private capital investments in TE, and creating high quality jobs for Californians.

[34] Assembly Bill (AB) 32, California Environmental Protection Agency, Assembly Bill 32 Overview, What does AB 32 do? https://www.arb.ca.gov/cc/ab32/ab32.htm.
[35] 2016 ZEV Action Plan, p. 4, https://www.gov.ca.gov/docs/2016_ZEV_Action_Plan.pdf.
[36] Executive Order B-30-15, 1. A, https://www.gov.ca.gov/news.php?id=18938.

D. Monitoring and Evaluation Plan

SDG&E intends to study and learn whether the proposed EV charging infrastructure at Park-and-Ride facilities will increase the amount of EVs in those neighborhoods and usage of the stations in general. The project will use grid-integrated charging to manage the load while the cars are parked there for long periods of time, as well as for the faster DCFC charging sessions. SDG&E will monitor usage data to share within the first year to study charging patterns at the public Park-and-Ride locations. SDG&E will also test an hourly grid-integrated rate in the public domain. This data will be shared with the CPUC and other stakeholders interested in using the data to further increase transportation electrification.

This project will also test the NIST standards set for public charging signage, rate display and general retail EV fuel dispensers, as outlined in NIST handbooks 30, 44, and 130.[37]

E. Future Opportunities/Scalability

Installing EV charging stations at Caltrans Park-and-Rides and along local highways have strong scalability opportunities. There are 33 state-owned Park-and-Ride locations within SDG&E's territory and more than 50 percent of these 33 locations are within or adjacent to DACs. If this project is successful, then it could be expanded to additional Park-and-Ride locations in the San Diego region and throughout California. The Electrify Local Highways Project will assist Caltrans in implementing their effort to install EV charging stations at 30 locations statewide,[38] and during our collaboration it was reported this must be accomplished within 30 months. Success will be demonstrated through data collection of charger usage and drivers time of day charging habits.

[37] National Institute of Standards and Technology, Electric Vehicle Fueling Systems Tentative Code Section 3.40 (A.2), Handbook 44 (2017), pg. 3-153. https://www.nist.gov/sites/default/files/documents/2016/11/10/3-40-17-hb44-final.pdf

[38] 2016 ZEV Action Plan, p. 27, https://www.gov.ca.gov/docs/2016_ZEV_Action_Plan.pdf.

F. Education and Outreach

SDG&E has strong knowledge and experience in EV charging. SDG&E has installed and managed over two hundred (200) EVSE at over twenty (20) different SDG&E facility locations for its employees within its territory. Additionally, SDG&E has gained EV charging knowledge and experience through the implementation process of the Vehicle-Grid Integration Pilot Program, since rebranded as "Power Your Drive."[39]

A strong customer communication plan, in partnership with Caltrans, will be developed to inform the region about the availability and accessibility of these charging stations in DACs. The plan will include a social media campaign, direct e-mail campaign targeted to SDG&E customers near each Park-and-Ride, as well as a direct e-mail campaign by Caltrans to current Park-and-Ride users. SDG&E will work with Caltrans to coordinate a grand opening for the charging stations in an effort to generate awareness through non-paid media.

SDG&E will work with Caltrans to determine the: (1) current and expected volume of EV drivers; (2) number of installations desired; (3) nearby transformer available capacity, knowing most have none; (4) distance between transformer and new service point; (5) site conditions related to construction feasibility; (6) charging station mounting surface, condition of facility; and (7) existing or available Americans with Disabilities Act ("ADA") accessible parking.

G. Estimated Project Costs

The estimated cost of SDG&E's Electrify Local Highways project is $4M. See Appendix A, Table ELH-1, for additional cost estimate details.

[39] Approved in D.16-01-045.

H. Conclusion and Summary

The Electrify Local Highways project should be designated for priority review because it is non-controversial in that it is relatively minor in scope and has the ability to scale up if the concept is accepted and utilized by the commuting public. Second, the project is a short term project and will not oversaturate the market. Finally, it is within the budget parameters to qualify for priority review.

IV. MEDIUM DUTY/HEAVY DUTY ("MD/HD") AND FORKLIFT PORT ELECTRIFICATION PROJECT

A. Description and Features

1. Project Summary

Project Components	SDG&E's Medium Duty/ Heavy Duty ("MD/HD") and Forklift Port Electrification Project
Commission Review Mechanism	Priority Review
Objectives	Conduct approximately 30-40 installations to obtain a consumption, charging and operational data set to allow for a future grid integration project for MD/HD[40] and forklift EV applications.
Market Segment and Vehicles Targeted	Commercial and Industrial: MD/HD and forklift vehicles within the San Diego Port District tidelands; Class 2-8 and forklift vehicles.
Vehicle Goals	Seventeen (17) grant funded MD/HD and forklift EVs.
Implementation Timeframe	Installations will be started after CPUC approval and data will be gathered and reported for one year after installation. The first grant funded EVs expected the first half of 2017.
Project Partners	San Diego Unified Port District ("Port District"), San Diego Port Tenant's Association ("SDPTA"), the San Diego Air Pollution Control District ("SDAPCD"), Terminalift LLC, CEMEX, and Dole Food Company.
Leveraged Funding	PON-14-605[41] ("Grant 1"), AQIP-GGRF[42] ("Grant 2") and GFO-15-604[43] ("Grant 3").

[40] California Transportation Electrification Assessment, Phase 3-Part A: Commercial and Non-Road Grid Impacts – Final Report (January 2016), p. 13, http://www.caletc.com/wp-content/uploads/2016/09/California-Transportation-Electrification-Assessment-Phase-3-Part-A.pdf.
[41] Grant 1 - CEC PON-14-605 MD and HD Advanced Vehicle Technology Demonstration.
[42] Grant 2 - CARB AQIP-GGRF Zero Emission Drayage Truck Demonstration.

Project Components	SDG&E's Medium Duty/ Heavy Duty ("MD/HD") and Forklift Port Electrification Project
Stranded Asset Mitigation	Site selection criteria such as potential for high utilization and future scalability will mitigate risk of stranded assets.
Grid Impacts	Lessons learned will allow for development of an optimized grid integration solution for the MD/HD and forklift EV market segment that will increase electric grid utilization.
Emissions Benefits & Accounting Methodology	Estimated GHG reduction: 228 $MTCO_2$/year[44]
CA Regulation Supported by Project	SB 32 SB 350 2016 ZEV Action Plan Executive Order B-30-15 Executive Order B-16-2012 Executive Order B-32-15 Climate Change Scoping Plan AB 628 California Sustainable Freight Action Plan Emissions Reduction Plan for Ports and Goods Movement in CA Diesel Risk Reduction Plan CARB Drayage Truck Regulation In-Use Off-Road Diesel Fueled Fleets Regulation
CPUC Regulation Supported by Project	§740.3(a), (c) §740.8 §740.12
Monitoring and Evaluation Plan	Monitoring for one year after installation to ensure asset utilization. One year of data will be evaluated at the conclusion of the project.
Cost	Estimated Cost: $2.4M

2. Project Description

San Diego Gas & Electric ("SDG&E") requests $2.4M in direct costs to install, operate, maintain and own EV charging infrastructure, load research meters and data loggers within the San Diego Unified Port District tidelands.[45] SDG&E will conduct approximately 30-40 installations. Each installation will include a combination of some or all of the following

[43] Grant 3 - CEC GFO-15-604 Freight Transportation Projects at California Seaports.
[44] *See* the direct testimony of J.C. Martin (Chapter 8) for further details.
[45] Further specifics of the proposal will be developed in collaboration with the Port District and the tenants, as necessary, pending Commission approval.

components: electric vehicle supply equipment ("EVSE"), an electric circuit, a load research meter and a data logger. Some installations will not require all of the components. Funding will go towards electric vehicle ("EV") infrastructure, load research metering, and data loggers to support grant funded MD/HD and forklift EVs.

Consumption, charging and operational data for MD/HD and forklift EVs is currently insufficient for utilities to determine how to efficiently integrate this type of charging into the electric grid. SDG&E will install load research meters as a minimum requirement for every project funded through this project. Utility involvement is essential to coordinate learning about regional MD/HD and forklift EV load.

SDG&E is seeking priority review to allow the purchase of data collection equipment to study grant funded EVs. None of the grant funded EVs have funding for load research meters. Using the load research meters, SDG&E will collect one year of data that will serve as a baseline. Automation technology is currently not robust enough to allow MD/HD and forklift EVSEs to fully respond to price signals. This technology can be developed, installed, and field tested in the future to allow comparison to the baseline data set. This will allow utilities to analyze how grid integration for the MD/HD and forklift EV market segment can be implemented and optimized. Grid integration is the ability to integrate charging during times that mitigate impacts to the distribution grid. The one-year baseline data collection process will help accelerate the implementation of an optimized grid integration solution for the MD/HD and forklift EV market segment.

3. Project Objectives, Market Segment, and Vehicles Targeted

One goal of this project is to obtain a consumption, charging and operational dataset to facilitate development of an optimized grid integration solution for MD/HD and forklift EV applications. Installation of approximately 30-40 load research meters and data loggers on

infrastructure and EVs respectively will facilitate development of an optimized grid integration solution for MD/HD and forklift EVs. Load research meters will collect consumption and charging data to evaluate energy consumption relative to time and demand. Data loggers will provide operational data such as operation-specific and EV-specific charging patterns. This information will aid in determining how to optimize grid integration, as well as electric fuel economy, to determine optimal battery and EVSE sizes.

Another goal achieved by this project is a reduction of GHGs by 228 $MTCO_2$ per year for the MD/HD and forklift EV market segment.[46] This goal will be achieved by replacing current diesel, gasoline and propane vehicles with EVs as well as adding new EVs for fleet additions in lieu of diesel, gasoline and propane vehicles.

The market segment is MD/HD and forklift vehicles within the Port District tidelands. Vehicles targeted will include Class 2-8 vehicles and forklifts.

4. Vehicle Goals

SDG&E will install a combination of 30 load research meters, 30 EVSE, and 30 data loggers to support approximately 30-40 new and existing MD/HD and forklift EVs. Not every installation needs all components, depending on what is currently in place.

5. Project Architecture

Typical EV project architecture will include a combination of a three phase circuit, load research meter, EVSE, and data logger as shown in Figure 3-3 below.

[46] *See* the direct testimony of J.C. Martin (Chapter 8), Section II, A, Table 8-1B.

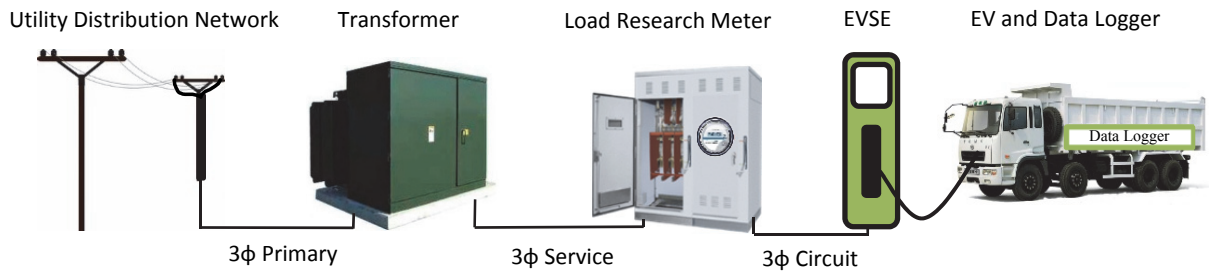

Figure 3-3: MD HD Forklift Project Architecture

6. Implementation Timeframe

SDG&E will conduct the installations upon CPUC approval of this project. Data collection will start upon each installation's completion and last for a one-year duration. SDG&E will compile, evaluate, draw conclusions, and report the project data. The report SDG&E creates will be shared with the CPUC and other interested stakeholders after the data collection process is complete.

7. Project Partners

The San Diego Unified Port District ("Port District") will be a key stakeholder to identify how the MD/HD and Forklift Port Electrification project can benefit the Port District's Climate Action Plan ("CAP").[47]

Port tenants, including Terminalift LLC, CEMEX and Dole Food Company, represent industry leaders in cargo services, building materials and fresh foods respectively. These three companies represent a few of the port tenants who are interested in TE. With such a diverse portfolio of customers, SDG&E will be able to learn about several industry-specific charging usage operations. This will help SDG&E implement larger, more robust programs in the future for MD/HD and forklift EV charging.

[47] Port of San Diego, Climate Action Plan (2013), https://www.portofsandiego.org/document/environment/climate-mitigation-and-adaptation-plan/documents-1/5515-port-of-san-diego-climate-action-plan/file.html.

SDG&E will continue to work with agencies that have been paramount in obtaining grant funds such as the San Diego Port Tenants Association ("SDPTA"), and the San Diego Air Pollution Control District ("SDAPCD").

8. Leveraged Funding

SDG&E has pledged support[48] for Grant 1, Grant 2 and Grant 3. These grants provide approximately $14M in local funding from the State of California for the procurement of EVs. The grants will provide funding for 13 Class-8 trucks, two conventional-sized forklifts, one 35,000-pound forklift, and one reach stacker with 100,000-pound capacity for containers.

The EVs for Grant 1 are currently scheduled to be delivered within the first half of 2017. The EVs for both Grant 2 and Grant 3 are currently scheduled to be delivered within the second half of 2017. While the grants provide much needed assistance, not all of them provide the necessary funding for EV charging infrastructure, and none of them provide funding for load research metering. Thus, SDG&E is requesting priority review for this project to fund necessary EV charging infrastructure.

9. Stranded Asset Mitigation

SDG&E will mitigate the risk of stranded assets by comparing and evaluating sites to choose those sites with large utilization potential and sites that have high future scalability. SDG&E will monitor assets for one year after installation.

B. Project Benefits

SDG&E intends to use this project to learn how to optimize grid integration for MD/HD and forklift EVs. The lessons learned from this project can also be shared with other utilities and

[48] SDG&E Letters of Support and Commitment for Grant 1, Grant 2 and Grant 3 are available upon request.

interested stakeholders so that they can optimize grid integration for MD/HD and forklift EVs and develop future, more robust programs.

1. Grid Impacts

SDG&E will collect consumption, charging and operational data from load research meters and data loggers for one year after installation. Obtaining a baseline data set will allow utilities to analyze how to optimize grid integration for the MD/HD and forklift EV market. Grid integration optimization is important for the MD/HD and forklift EV market because it will allow for better grid utilization and ultimately mitigate the need for additional power generation facilities. At the conclusion of SDG&E's data analysis process, SDG&E will provide a report to the Commission that can be shared with interested stakeholders. The report will include lessons learned and anonymized / aggregated data and conclusions to help stakeholders better understand strategies to integrate the electric grid for MD/HD and forklift EVs.

2. Ratepayer Interest

This project will collect data that will allow for an optimal grid integration solution to be developed for the MD/HD and forklift EV market segment. Widespread TE may increase total system load, but an optimal grid integration solution that includes automation technology could mitigate increases to the peak load and provide potential ratepayer benefits by increasing grid utilization. This project will obtain the knowledge necessary to implement widespread TE for the MD/HD and forklift EV market segment in a controlled way that increases electric grid utilization.

Another ratepayer benefit of this project is better air quality for DACs. The majority of the grant vehicles for this project are located in DACs. Project partners such as Terminalift LLC, CEMEX and Dole Food Company all reside within Barrio Logan, one of the highest scoring

DACs in San Diego County. SDG&E will strive to make as many installations in DACs, where appropriate, while taking other site selection criteria into account.

SDG&E will not create a new rate design for this project because automation technology that can turn on and off EVSEs based on price signal inputs is not readily available for the MD/HD and forklift EV market segment. The new load will utilize the customer's existing accounts and rates.

3. Emissions Benefits and Accounting Methodology

GHG reductions from the MD/HD Port Electrification project provide air quality benefits for all ratepayers. First year reductions of 228 $MTCO_2$ are estimated, resulting in lifetime net CO_2 reductions of 4,102 MT for the vehicles included in the MD/HD Port Electrification project.[49]

C. Regulation Supported by Project

1. California Agency Regulation Supported by Project

The MD/HD and Forklift Port Electrification project supports AB 628,[50] which authorizes the Port District to work with SDG&E to create an Energy Management Plan ("EMP") to reduce GHG emissions and encourage economic growth. SDG&E and the Port District are currently collaborating to fulfill the objectives of AB 628.

This project supports SB 350, which directs SDG&E to file a TE application in order to promote "widespread transportation electrification."[51] The MD/HD and Forklift Port Electrification project supports SB 350 by entering and supporting this currently nascent market segment.

[49] *See* the direct testimony of J.C. Martin (Chapter 8), Tables 8-1A and 8-1B.
[50] Assembly Bill ("AB") 628, Chapter 741, Section 2.
[51] Senate Bill ("SB") 350, Chapter 547, Sections 30, 32.

2. CPUC Regulation Supported by Project

The MD/HD and Forklift Port Electrification project supports the following CPUC Regulation:

- Section §740.3(a) and(c): SDG&E, as an electrical corporation, will evaluate and implement policies to promote the development of equipment and infrastructure needed to facilitate the use of electric power and this project is in the ratepayers' interest and will not unfairly compete with nonutility enterprises.
- Section §740.8: by creating high-quality job or other economic benefits, including in DACs, for the installation and maintenance of the proposed EV infrastructure
- Section §740.12(a)(1)(F): by stimulating innovation and competition by EV manufacturers and EVSPs, attracting more private capital investments in TE, and creating high-quality jobs for Californians

D. Monitoring and Evaluation Plan

SDG&E will conduct monitoring for one year after installation. Data from load research meters will be captured and transferred to SDG&E through the Smart Meter network and billing data warehouse. Information collected will include charging times, duration, energy consumption, frequency of charging, and demand. Data from data loggers will be captured and transferred to SDG&E through a secure communications system. Information collected will include operational data such as EV specific charging patterns.

At the conclusion of SDG&E's data analysis process, SDG&E will collect one year of baseline data and provide a report to the CPUC that can be shared with interested stakeholders. The report will include anonymized / aggregated data and graphs such as energy consumption relative to time, demand and lessons learned.

E. Future Opportunities/Scalability

The scope of this project represents less than one percent of the total MD/HD and forklift vehicle population within the Port District tidelands as shown in Figure 3-4 below. SDG&E may scale this project up in the future as part of a standard review filing in order to promote widespread TE within this large market.

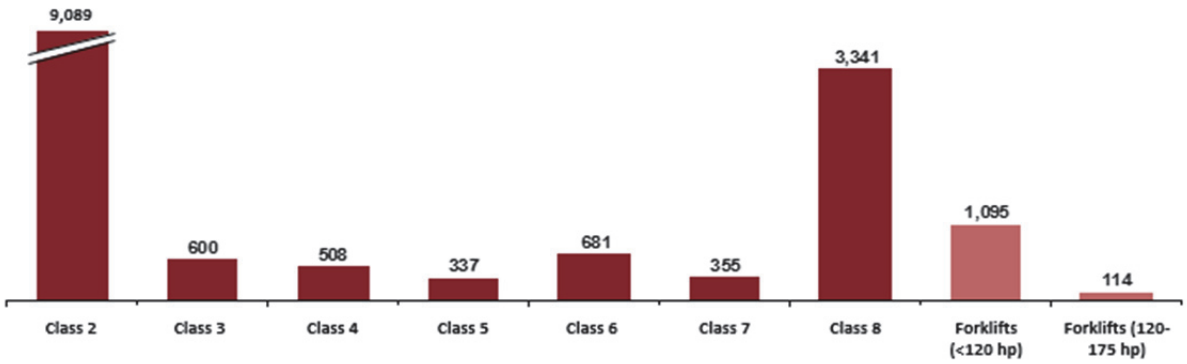

Figure 3-4: MD/HD[52] and Forklift[53] Vehicle Population within the San Diego Port District Tidelands

F. Education and Outreach

SDG&E will conduct an education and outreach effort to the Port District's tenants for this project. This education and outreach effort will include equipment demonstrations and one-on-one meetings. SDG&E will leverage the company's current relationships with the Port District's tenants through SDG&E account executives, and by participating in local partnership teams and local trade organizations in which the tenants participate.

[52] Proprietary R.L. Polk fleet data purchased by SDG&E was filtered by zip codes for the San Diego Port District tidelands. Data does not include out-of-state and international registration vehicles. It also does not include vehicles that are registered with addresses outside the San Diego port tideland zip codes. Class 2 population include vehicles >6,000 lbs.

[53] California Environmental Protection Agency, Air Resource Board, Mobile Source Emissions Inventory (February 2016), https://www.arb.ca.gov/msei/categories.htm/#offroad_motor_vehicles
Forklift population is obtained from CARB off-road vehicle inventory database for San Diego County. Forklifts within the San Diego Port District tidelands are estimated based on the percent of class 8 HD trucks within the San Diego Port District tidelands relative to the total for San Diego County. Includes estimates for gasoline / liquefied natural gas (LNG) powered vehicles.

G. Estimated Project Costs

The estimated cost of SDG&E's MD/HD Port Electrification project is $2.4M. See Appendix A, Table PE-1, for additional cost estimate details.

H. Conclusion and Summary

CPUC authorization for direct cost recovery of $2.4M is necessary for the charging infrastructure, data loggers, and related O&M for the MD/HD and Forklift Port Electrification project. This will allow SDG&E to obtain consumption, charging and operational data that is necessary for development of an optimal grid integration solution for MD/HD and forklift EV market. An optimal grid integration solution for the MD/HD and forklift EV market has the potential to improve grid utilization. As noted above, this project is forecasted to reduce GHGs by 228 $MTCO_2$ per year for this market segment. The MD/HD and Forklift Port Electrification project will help promote widespread TE and EV adoption in this emerging market segment.

The MD/HD and Forklift Port Electrification project should be designated for priority review by the Commission. The project meets the requirements set forth in the ACR. Specifically, the project is non-controversial in that it is relatively minor in scope and has a strong emphasis on data collection. Data collection and analysis will inform all market participants and enable the market. This market segment is not as robust and must be examined operationally. In addition, the project is short term, will be deployed within one year and will not oversaturate the market. Finally, it is within the budget parameters to qualify for priority review.

V. FLEET DELIVERY SERVICES PROJECT

A. Description and Features

1. Project Summary

Project Components	SDG&E's Fleet Delivery Services Project
Commission Review Mechanism	Priority Review
Objectives	Provide charging infrastructure and support for electric fleet delivery vehicles in SDG&E's service territory; analyze one year of meter and on-board data logger information in order to better integrate future electrification of the Goods and Fleets market segment.
Market Segment and Vehicles Targeted	Commercial Market (Goods and Fleets); Level 2 and DCFC, medium-duty fleet delivery vehicles.
Vehicle Goals	Install charging infrastructure (Level 2 and DCFC) to serve approximately 90 new electric delivery vehicles.
Implementation Timeframe	Project runs for one year beginning on first operation of the delivery vehicles.
Project Partners	UPS as primary customer partner for fleet electrification CALSTART for data analysis. Engage third parties for installation, maintenance, and network capabilities of EVSE to third parties.
Leveraged Funding	Project partners for fleet electrification will procure electric delivery vehicles for project.
Stranded Asset Mitigation	SDG&E will install charging infrastructure based on the commitment from the project partners for fleet electrification to procure and operate the vehicles. SDG&E will own and maintain the charging infrastructure and will ensure that assets continue to be operated and useful.
Grid Impacts	Load management plans will be constructed to minimize substantial grid impacts without interrupting the partner's daily business operations. SDG&E will seek approval for a commercial grid integrated rate, which reflects grid conditions and encourages off-peak charging.
Emissions Benefits & Accounting Methodology	Estimated GHG reduction: 894 $MTCO_2$/year[54]

[54] *See* the direct testimony of J.C. Martin in Chapter 8 for further details.

Project Components	SDG&E's Fleet Delivery Services Project
CA Regulation Supported by Project	SB 32 SB 350 2016 ZEV Action Plan Executive Order B-30-15 Executive Order B-16-2012 Low Carbon Fuel Standard Climate Change Scoping Plan Diesel Risk Reduction Plan
CPUC Regulation Supported by Project	§740.3(a), (c) §740.8 §740.12
Monitoring and Evaluation Plan	CALSTART will collect and analyze data.
Cost	Estimated Cost: $3.7M

2. Project Description

SDG&E's Fleet Delivery Services Project will allow SDG&E to partner with local delivery service businesses to help support electrification of their fleet delivery vehicles. SDG&E will provide the necessary charging infrastructure for project partners based on their operational needs. The project partners will procure the electric delivery vehicles and use them in their day-to-day operations for the year-long project. The project will add charging stations for approximately 90 new medium-duty electric delivery vehicles in SDG&E's service territory. Information from on-board data loggers and meter data will be collected and analyzed in order to better understand fleet delivery vehicle electrification.

3. Project Objectives, Market Segment, and Vehicles Targeted

The Fleet Delivery Services Project is intended to encourage, support and accelerate the electrification of regional delivery vehicles by eliminating barriers of charging infrastructure and its associated cost to TE. Fleet delivery trucks are utilized by a wide range of businesses, in the goods and fleets commercial market, in their day-to-day operations and are found throughout SDG&E's service territory, the state of California, the nation, as well as all around the world.

In addition to well-known, traditional delivery services such as the United Parcel Service, Inc. ("UPS"), FedEx Corporation ("FedEx"), the United States Postal Service ("USPS") and others, there are more recent entrants into the fleet delivery operation, such as Amazon's Prime Now, and local, fresh grocery delivery. It can be expected that the number of local delivery trucks will continue to increase with the expansion of online shopping as shown by the growth of just one popular cyber market: Amazon. About 190 million U.S. consumers—more than half of the U.S. population—will shop online this year.[55] According to the Bureau of Labor Statistics, "[c]ontinued e-commerce growth should increase demand for package delivery services, especially for the large and regional shipping companies" and "[m]ore light truck and delivery drivers will be needed to fulfill the growing number of e-commerce transactions."[56] They also note that "[a]s the number of restaurants that offer delivery services continues to expand, the demand for food delivery drivers should grow."[57] Thus, it is expected that the electrification of delivery vehicles will begin to displace petroleum-consuming vehicles, which would otherwise be required to provide the local delivery services.

The Fleet Delivery Services Project is a good candidate for TE in SDG&E's service territory for a number of reasons. Fleets that operate in urban centers, have stop-and-go driving cycles, are centrally maintained and fueled, and are well suited for introducing zero-emission technology.[58] According to a study by the National Renewable Energy Laboratory ("NREL"), a significant amount of daily drive cycle operational time of fleet delivery vehicles is spent

[55] Farber, M. (June 2016). Consumers Are Now Doing Most of Their Shopping Online. Fortune Magazine, http://fortune.com/2016/06/08/online-shopping-increases/.
[56] Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook (2016-17), Delivery Truck Drivers and Driver/Sales Workers https://www.bls.gov/ooh/transportation-and-material-moving/delivery-truck-drivers-and-driver-sales-workers.htm in Job Outlook tab.
[57] *Id*.
[58] California Air Resource Board, Advanced Clean Trucks (January 2017), https://www.arb.ca.gov/msprog/actruck/actruck.htm.

idling.[59] Independent of vocation, fleet delivery vehicles spend roughly 50% of vehicle operating time while the vehicle is not in motion.[60] Due to these frequent idling operational characteristics, traditional petroleum fueled delivery vehicles will emit more pollutants per mile than an equivalent vehicle at typical cruising speeds.[61] In addition, a number of regional fleet delivery vehicles have predictable daily routes which allow for confidence by commercial entities that electrification of their vehicles will not disrupt their day-to-day operations. As stated by the Electric Power Research Institute ("EPRI"), delivery vehicles are prime electrification candidates.[62]

The California Hybrid, Efficient and Advanced Truck Research Center ("CalHEAT") Roadmap identified delivery applications as a good fit for electric trucks.[63] The following characteristics make electric trucks and parcel delivery a good match:[64]

- vehicles operate in dense urban areas characterized by low speeds and stop-and-go operations;
- vehicles operate on a fixed route covering less than 100 miles per day;
- vehicles return to the same depot every day where they can be recharged;

[59] National Renewable Energy Laboratory, Data Collection, Testing, and Analysis of Hybrid Electric Trucks and Buses Operating in California Fleets Final Report (June 2015), http://www.nrel.gov/docs/fy15osti/62009.pdf

[60] *Id.*

[61] U.S. Department of Energy, Driving More Efficiently, See http://www.fueleconomy.gov/feg/driveHabits.jsp then click on Clean Cities Idle Toolbox link within the Avoid Excessive Idling section.

[62] Electric Power Research Institute, Commercial & Industrial Guide to Electric Transportation (February 2015), p. 11 from downloaded complete report, http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000003002004898.

[63] California Hybrid, Efficient and Advanced Truck (CalHEAT) Research Center, CalHEAT Technology Roadmap (March 2013), http://www.calstart.org/Libraries/CalHEAT_2013_Documents_Presentations/CalHEAT_Roadmap_-_Brotherton_Presentation.sflb.ashx.

[64] California Energy Commission, Battery Electric Parcel Delivery Truck Testing and Demonstration (August 2013), p. 17, http://www.calstart.org/Libraries/CalHEAT_2013_Documents_Presentations/Battery_Electric_Parcel_Delivery_Truck_Testing_and_Demonstration.sflb.ashx.

- vehicles can be recharged overnight;
- electric motors are able to produce maximum torque at low speeds, giving electric trucks' strong driving characteristics, particularly in stop-and-go or urban driving situations; and
- electric motors also offer the ability to operate with very low noise, an advantage in certain delivery applications.

The goals of the Fleet Delivery Services Project are as follows:

- proof of concept that regional fleet delivery vehicles can be electrified without impeding their daily responsibilities and operations;
- determine the charging infrastructure needs for fleet delivery vehicles with regards to utility infrastructure and the associated number of stations and type of charging speeds;
- collect data on the overall charging patterns and costs to allow operators to minimize their electric vehicle fuel costs;
- analysis of data collected through data loggers which will help evaluate the performance of the vehicles, their charging patterns and needs, and impacts on the overall energy use for the fleet; and
- assess the grid impacts from the specific fleet demonstration, including impacts at the site and local level.

Key learnings from this project leverage data collection in order to understand usage patterns and operational needs specific to the industry. The project will leverage data loggers and data from load research meters to gather a robust data set for analysis. It is important to understand the impacts of increased load at one location due to ten, twenty or one hundred

electric delivery vehicles charging concurrently. Data and learnings from this project are transferrable to the rest of California, the nation and worldwide.

4. Vehicle Goals

SDG&E will partner with UPS as the primary customer partner to help support electrification of 60 of their delivery vehicles. There is additional charging infrastructure funding in the proposal for other participants that will support a total of approximately 30 additional vehicles. SDG&E will provide the necessary infrastructure and EVSE installations to support L2 charging ports and three DCFCs for partners based on their needs. Altogether, this project will add approximately 90 new medium-duty electric delivery vehicles on the road. SDG&E will own, install, operate and maintain the EVSEs, because EV charging infrastructure is not a core competency of UPS and other fleet services. Anecdotally, these types of partners have stated that they do not want to own or maintain the EVSEs. These companies intend to focus on optimally running their business, rather than procuring and maintaining infrastructure outside of their core competency.

5. Project Architecture

Upon approval by the Commission, SDG&E will own, install, operate and maintain the grid-integrated charging infrastructure to support L2 stations for fleet delivery vehicles, as well as three DCFCs. SDG&E's ownership and maintenance of the L2 chargers and DCFCs will help ensure that the chargers are operational and accessible. A key aspect of this project is data collection. Data collection will allow for the study and analysis of many aspects of TE for this market segment and provide data to inform total cost of ownership analysis.

SDG&E will own and maintain the charging stations to help ensure that they are operational and result in robust data collection. The data will be less reliable if some of the stations are not usable. The lack of usable chargers will result in changed behavior, which will

impact the data. As electrification of this market segment evolves it may make sense to examine other ownership models but at this time and for this project it is important that the charging stations remain operational to provide for robust data collection and also to give confidence to fleet delivery service operators that their vehicles will be able to be charged.

SDG&E will provide and install all conduit, cable, concrete foundations, EVSEs, meters, data loggers and any other various electrical equipment upgrades. The infrastructure upgrades will support and include all infrastructure up to the EVSE. SDG&E will contract with qualified third party EVSPs to provide the charging equipment and operating system, as well as skilled labor for installation. The project will remove a major barrier to the TE of delivery vehicles by providing and maintaining the necessary infrastructure for charging, as well as gather valuable data which will ideally lead to further fleet electrification.

In this project, as described in Cynthia Fang's Chapter 5 direct testimony, SDG&E is proposing a commercial grid integrated rate that will reflect grid conditions and encourage off-peak charging. SDG&E will also work with associated host site partners to create a load management plan that efficiently integrates the new load with SDG&E's grid, thereby generating benefits to all ratepayers through grid optimization. The load management plan supported by SDG&E and implemented by the site host should reduce or eliminate charging at times when the grid is congested and incentivize customers to charge their vehicles at more grid-friendly times. The customer who maintains and operates the fleet of vehicles will be responsible for payment of the electricity consumed by their vehicles.

An important aspect of this project is that SDG&E will collaborate and assist in quantifiable data collection to better understand the needs of future electrification of fleet delivery vehicles. SDG&E has partnered with CALSTART, an organization dedicated to

supporting a growing high-tech clean transportation industry, to collect, measure and analyze data from this project. SDG&E will in turn use that information to determine the benefits of an expansion program to encourage widespread TE in the fleet delivery services sector.

Figure 3-5 below shows a typical illustration of the charging infrastructure. This will be the general architecture for partners with solely L2 charging infrastructure.

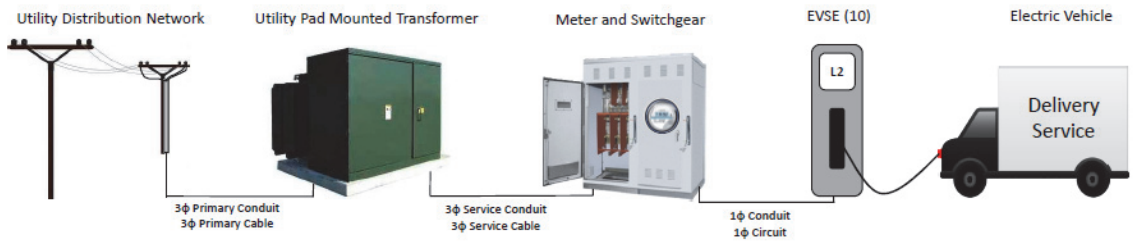

Figure 3-5: Charging Architecture with solely L2

The UPS fleet will contain data loggers on the trucks that will provide data for analysis.

Figure 3-6 below shows the proposed architecture for the three UPS sites with 20 L2 stations and 1 DCFC, as well as data loggers on the vehicle itself.

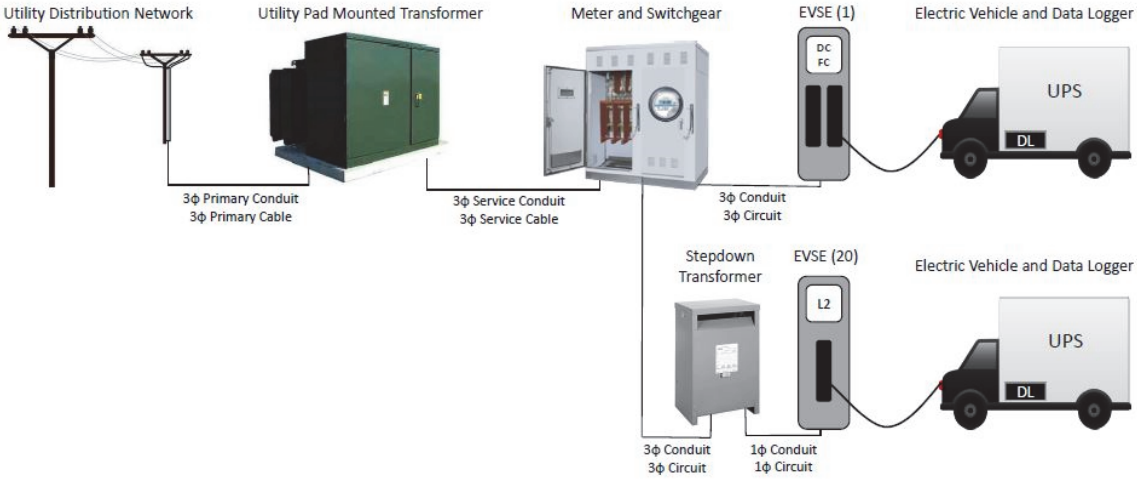

Figure 3-6: Charging Architecture with DCFC and L2

6. Implementation Timeframe

The project will run for one year starting from the delivery vehicle in-service date. One-year of data collection will allow sufficient time to gather granular data that is robust enough for analysis purposes that will include the impacts of daily, weekly, monthly and seasonal trends. SDG&E will continue to encourage EV adoption to other companies in the delivery business.

7. Project Partners

The project is a collaborative partnership that will bring together SDG&E, forward-thinking early adopters who want to transition to a cleaner fleet of delivery vehicles, EV manufacturers, EVSPs, and clean transportation initiative groups. The partners will work together to reduce barriers to TE and advance technology solutions for delivery vehicles.

SDG&E has partnered with UPS as the primary customer partner to help launch this project and test the feasibility of future electrification in this market segment. The UPS fleet has approximately 105,000 delivery trucks worldwide, with more than 7,700 alternative fuel and advance technology vehicles.[65] UPS has shown a commitment to set and meet fuel-efficiency goals for their fleets, as shown by voluntarily joining the Environmental Protection Agency's ("EPA") SmartWay Transport Partnership, an innovative program that helps businesses move goods in the cleanest, most efficient way possible.[66]

SDG&E will provide charging infrastructure for UPS at three locations within SDG&E's service territory. Each location will have twenty (20) L2 chargers and one DCFC. Each location will support twenty (20) electric delivery vehicles. These delivery vehicles will charge overnight at the delivery hub location. The addition of one DCFC per UPS location gives more certainty

[65] UPS Fact Sheet (2015), https://pressroom.ups.com/pressroom/ContentDetailsViewer.page?ConceptType=FactSheets&id=1426321563187-193.
[66] EPA SmartWay, https://www.epa.gov/smartway/learn-about-smartway.

that operations will be supported, especially during busy operational days and seasons with a large amount of deliveries, such as Mother's Day and Christmas. UPS has indicated that during these busy seasons, the delivery vehicles are out on the road for a longer period of time and do not have as long to charge the vehicle with a L2 charger. The DCFC will also act as backup for instances when an operator forgets to charge their vehicle overnight. In these instances, the DCFC would be onsite for back up or to quickly "top off" as needed. It is imperative that the electrification of vehicles does not negatively impact the core operations of the businesses. The utilization and need of the DCFC will be analyzed as part of the project. In total, the charging infrastructure will support approximately 60 UPS electric delivery vehicles.

SDG&E is committed to working with all customers in the SDG&E territory who are pursuing TE and doing their part to reduce GHG emissions. SDG&E intends to continue having dialogues with customers who maintain fleet delivery vehicles. Those dialogues will continue after the immediate application has been submitted.

In addition to the project costs for UPS, SDG&E will set aside funds to electrify additional fleet delivery service vehicles for approximately 30 additional Level 2 chargers, which will result in approximately 30 new electric delivery vehicles. The funds will not be spent unless fleet delivery service customers commit to procuring the electric delivery vehicles. The additional charging ports will be installed during the same time period as the ports that have been allocated to UPS.

It is important to allow for a degree of flexibility to support early adopters who are economically unable to convert to EVs because of the charging infrastructure cost. The funds set aside for 30 L2 chargers will allow for additional fleet conversion in the near term. Vehicle procurement is a long term investment. Electric vehicles and their adoption will drive the

retirement of internal combustion engine ("ICE") vehicles, and should be encouraged and supported. SDG&E has spoken to additional customers who are interested in pursuing delivery services fleet electrification but are unable to commit at this time. Reducing barriers, such as the cost of charging infrastructure, for first adopters is important so they choose electrifying vehicles sooner than they might otherwise.

SDG&E and CALSTART will collaborate to track, analyze and disseminate data collected through this project. CALSTART will analyze the data from delivery truck data loggers on approximately 60 UPS delivery vehicles and perhaps 30 additional vehicles when partners are brought on-board.

8. Leveraged Funding

This project leverages the funds of the participating partners for the lease or ownership of the EV. For illustrative purposes, in 2012, the California Energy Commission ("CEC") assisted UPS in deploying 17 electric delivery vans with a $2.5 million grant to Electric Vehicles International ("EVI") to modernize their state-of-the-art technology.[67] The CEC-funded vans that were deployed in the UPS fleet cost approximately $143,000 per truck.[68] The upfront cost of an electric delivery truck can be approximately three times more expensive than an equivalent ICE vehicle.[69] UPS and all project partners are making a large investment in electric delivery vehicles. Their willingness to procure more expensive vehicles with relatively nascent technology is an essential contribution to this project. It is clear that without this leveraged funding of the electric delivery vehicles by the associated partners, the cost of this project would increase and likely not be possible.

[67] California Energy Commission and UPS, http://www.energy.ca.gov/tour/ups/.
[68] California Air Resources Board, Technology Assessment: Medium- And Heavy- Duty Battery Electric Trucks and Buses (October 2015), p. IV-13, https://www.arb.ca.gov/msprog/tech/techreport/bev_tech_report.pdf.
[69] MIT Center for Transportation & Logistics (February 2012), http://ctl.mit.edu/news/driving-green.

9. Stranded Asset Mitigation

SDG&E has specifically identified and partnered with UPS, who is interested in fleet delivery truck electrification and provides a degree of certainty that these assets will remain used and useful. SDG&E has actively started conversations with other potential partners for the remaining funds requested for this project.

B. Project Benefits

1. Grid Impacts

In order to economically integrate electric fleet vehicles into the local delivery business, SDG&E will assist the associated partner in creating a load management plan to reduce charging during on-peak time periods. A load management plan is also beneficial to SDG&E, partners and ratepayers to help incorporate the new load and potentially mitigate impacts to the circuit's current peak load. In turn, this provides an opportunity to mitigate the need for upgrades to SDG&E's distribution system or fund new generation. Please see J.C. Martin's Chapter 8 testimony for additional details on grid impacts in combination with other priority review projects.

2. Ratepayer Interest

The electrification of fleet delivery vehicles as part of this project benefits the partner companies and SDG&E's ratepayers. The companies that will participate in this collaborative partnership are helping to expand the use of EVs and encouraging technological advancements. TE adoption also grants health and environmental benefits to the local community by reducing GHG emissions.[70]

[70] New Research Quantifies Health Benefits of Reducing Greenhouse Gas Emissions. Lawrence Berkeley National Laboratory (November 2014), http://newscenter.lbl.gov/2014/11/18/new-research-quantifies-health-benefits-of-reducing-greenhouse-gas-emissions/.

SDG&E's participation in the creation of a load management plan is beneficial to ratepayers to help incorporate the new load and potentially mitigate impacts to the circuit's current peak load. In turn, this provides an opportunity to mitigate the need for upgrades to SDG&E's distribution or generation infrastructure.

SDG&E's Fleet Delivery Service Project intends to target delivery vehicle hubs that are located within or adjacent to DACs. According to the California Environmental Protection Agency ("CalEPA"), DACs can be identified based on a variety of environmental hazard, geographic, socioeconomic, and public health criteria. SDG&E's intent to focus a substantial amount of this project in DACs aligns with California's emphasis on improving DACs.

Two of the three established UPS site locations for this project are located within a DAC. SDG&E has also allotted additional funds for approximately three more locations to undergo fleet electrification using the "set-aside" funds. With that, SDG&E will continue to prioritize DACs for potential locations for TE in this project.

3. Emission Benefits and Accounting Methodology

This project will support approximately 90 incremental EVs and result in estimated GHG emission reduction of 894 $MTCO_2$ per year. Lifetime net CO_2 reductions are estimated at 14,109 MT.[71]

C. Regulation Supported by Project

1. California Agency Regulation Supported by Project

The Fleet Delivery Services Project specifically supports Executive Order B-30-15, which sets a goal to decrease GHG emissions to 40% below 1990 levels by 2030 and 80% below 1990 levels by 2050 and Executive Order B-16-2012, which orders and directs the rapid commercialization of ZEVs.

[71] *See* the direct testimony of J.C. Martin in Chapter 8 for further details.

This project targets battery electric vehicles ("BEV") as opposed to plug-in hybrid electric vehicles ("PHEV") which will support the Governor's 2016 ZEV Action Plan goal of 1.5 million ZEVs in California by 2025 and also allow for greater reduction in GHG emissions to meet Senate Bill 32.[72]

2. CPUC Regulation Supported by Project

The Fleet Delivery Services Project supports the following CPUC Regulation:

- §740.3(a) and(c): SDG&E, as an electrical corporation, will evaluate and implement policies to promote the development of equipment and infrastructure needed to facilitate the use of electric power and this project is in the ratepayers' interest and will not unfairly compete with nonutility enterprises; and
- §740.8: by creating high-quality job or other economic benefits, including in DACs, for the installation and maintenance of the proposed EV infrastructure.
- §740.12: by stimulating innovation and competition by EV manufacturers and EVSPs, attracting more private capital investments in TE, and creating high-quality jobs for Californians.

D. Monitoring and Evaluation Plan

SDG&E intends to use this project to learn how to support TE of fleet delivery vehicles. As previously discussed, data will be collected by working with the participating partners for evaluation. This will ultimately be accomplished by data loggers, enabling technology, as well as the experience of the partner.

SDG&E will also learn how to support the companies who are participating in this project, as well as similarly situated companies, in a manner that mitigates negative impacts to

[72] 2016 ZEV Action Plan, https://www.gov.ca.gov/docs/2016_ZEV_Action_Plan.pdf.

the grid. SDG&E will learn how the EVs operate, what speed of charging is beneficial to the partner and the utility grid, and the number of EVSE and infrastructure upgrades needed to expand TE.

CALSTART has indicated that it will support SDG&E's proposed project by providing third-party evaluation of integration of medium-duty electric fleet vehicles to the grid. CALSTART will leverage its expertise to collect, track and analyze the data as follows:

- Vehicle Performance and Energy Use – The goal of this task is to collect data on the overall performance of the vehicles. This task will include collecting vehicle performance parameters using existing (or separately installed) data loggers, which collect real-world in-service data. This will include collecting data from at least one baseline vehicle to be used for comparison purposes. The data will be remotely transferred to CALSTART servers and compiled for further analysis. In addition, the data from charging will be collected from the off-board charging equipment, as well as the overall electricity use at the site. The analysis of this data will help evaluate the performance of the vehicles, their charging patterns and needs, and impacts on the overall energy use for the fleet. CALSTART will produce the following:
    - Data Collection Test Plan;
    - Analysis and Quarterly Performance Reports; and
    - Draft and Final Performance Reports.
- Grid Impacts and Scenarios – This task will focus on assessing the grid impacts from the specific fleet demonstration, including impacts at the site and local level. The demand side data from the vehicle performance and energy use will inform

the needs at the local distribution level of the electric grid. CALSTART will also address future growth and the impacts at higher numbers of vehicles expected in the future. Finally, based on the expected future penetration of electric medium-duty EVs in the region, and in collaboration with the utility, possible future grid scenarios will be proposed. CALSTART will produce the following:

- Grid Impacts from This Study;
- Demand Assessment and Future Growth; and
- Future Grid Scenarios.

E. Future Opportunities/Scalability

According to a truck inventory of California vehicles carried out by the CalHEAT Research Center, there were about 253,000 Class 3-8 Work-Urban trucks in California in 2010.[73] CalHEAT determined that about 70,000 of those were Class 3-4 Vocational Work-Urban trucks.[74] The gathering of information and operational characteristics through this project will increase confidence that expansion of TE to other fleet delivery services is possible. Indeed, the lessons learned through this project in SDG&E's service territory may be transferrable to the remaining of California's Class 3-4 Vocational Work-Urban trucks.

Results from the Monitoring and Evaluation Plan can be used to support early adopters, such as UPS, expand TE of delivery fleets beyond the SDG&E service territory. For example, if SDG&E can successfully assist UPS in electrifying portions of their San Diego fleet, this will allow UPS to take lessons learned and expand fleet electrification to the rest of California, the

[73] California Energy Commission, Battery Electric Parcel Delivery Truck Testing and Demonstration (August 2013), p. 15, http://www.calstart.org/Libraries/CalHEAT_2013_Documents_Presentations/Battery_Electric_Parcel_Delivery_Truck_Testing_and_Demonstration.sflb.ashx.

[74] *Id*.

country and even in their worldwide services. The data and results will also provide actionable data for other operators of fleet delivery services.

Fleet delivery services range far beyond just California. Delivery services expand throughout our nation and around the entire world, allowing for many future opportunities for TE in the good and fleets commercial market.

F. Education and Outreach

While SDG&E has partnered with UPS for this project, the intent is to seek out additional partners with the "set-aside" funding. The additional funds will help to electrify approximately thirty (30) additional vehicles for early adopters of TE, reduce GHG emissions, and allow for greater data collection and subsequent analysis.

There will be an education and outreach campaign developed that will focus on advancing and supporting TE of this market segment. The effort may include hosting local workshops with fleet customers in SDG&E's territory to discuss the best practices and conversion efforts that have come out of this project, as well as possibly hosting online or conference call workshops to connect local fleets with fleet operators throughout the state. To do this, partners like CALSTART and other trade organizations focused in this area will be leveraged.

G. Estimated Project Costs

The estimated cost of SDG&E's Fleet Delivery project is $3.7M. See Appendix A, Table FDS-1, for additional cost estimate details.

H. Conclusion and Summary

SDG&E respectfully requests that the CPUC approve this project as proposed. The project requests a modest investment that has the potential to transform a growing delivery industry. As described above, this is a growing market segment with a lot of potential to

transform. Electrification of delivery vehicle fleets could occur quickly if vehicle operators trust the technology and see that the total cost of ownership is reasonable. SDG&E's project, with the inclusion of a forward thinking organization such as UPS and support of the CPUC, can make a change within California and beyond. The data and analysis resulting from this project can be the extra push needed to accelerate change.

The Fleet Delivery Services Project should be designated for priority review by the CPUC. The project meets the requirements set forth in the ACR. Specifically, the project is non-controversial in that it is relatively minor in scope and has a strong emphasis on data collection. Data collection and analysis will inform all market participants and enable the market. Second, the project is short term, will be deployed within one year and will not oversaturate the market. Finally, it is within the budget parameters to qualify for priority review.

VI. GREEN TAXI/SHUTTLE/RIDESHARE PROJECT

A. Description and Features

1. Project Summary

Project Components	SDG&E's Green Taxi/Shuttle/Rideshare Project
Commission Review Mechanism	Priority Review
Objectives	Grid integrated DCFC rapid charging for high mileage taxi, shuttles and TNC electric vehicles.
Market Segment and Vehicles Targeted	People Movement: High mileage taxi, shuttles and TNC electric vehicles.
Vehicle Goals	Support up to 4 EV taxis, 4 electric shuttles and 50 TNC/Rideshare EVs by deploying up to 5 grid integrated charging facilities (one DCFC and two Level 2 EVSE each), and provide drivers with home L2 EVSE, where feasible.
Implementation Timeframe	Project runs for one year once the vehicles are in-service.
Project Partners	Taxi, shuttle and TNC companies/drivers; project charging facility site hosts; EVSPs, and contractors.
Leveraged Funding	CVRP, HVIP, Fed. Tax Credit, LCFS Credits and utility incentives.
Stranded Asset Mitigation	Select sites that maximize asset utilization; rate of deployment aligned with vehicle rate of adoption.
Grid Impacts	Grid-integrated rate designed to encourage charging during off-peak, low-priced hours; explore one solar/energy storage integrated charging facility's energy supply and demand profile.
Emissions Benefits & Accounting Methodology	Estimated GHG reduction: 769 MT of CO_2/year[75]
CA Agency Regulation Supported by Project	SB 32 SB 350 2016 ZEV Action Plan Executive Order B-30-15 Executive Order B-16-2012 San Diego County Regional Airport Authority Air Quality Management Plan[76] Climate Change Scoping Plan

[75] *See* the direct testimony of J.C. Martin (Chapter 8) for further details.
[76] San Diego County Regional Airport Authority Air Quality Management Plan (November 2009), http://www.san.org/Portals/0/Documents/Environmental/SAN%20AQMP%20Draft%20Final%20Report.pdf.

Project Components	SDG&E's Green Taxi/Shuttle/Rideshare Project
CPUC Regulation Supported by Project	§740.3(a), (c) §740.8 §740.12
Monitoring and Evaluation Plan	An M&E plan is included with this project to study and report data.
Cost	Estimated Cost: $3.5M

2. Project Description

San Diego Gas & Electric's ("SDG&E") Green Taxi/Shuttle/Rideshare project proposes to partner with Taxi Companies, Shuttle Companies and Transportation Network Companies interested in the electrification of their fleet to support them with grid integrated charging facilities, including direct current fast chargers ("DCFC") and Level 2 ("L2") electric vehicle supply equipment ("EVSE") and a grid integrated rate. The project also proposes to support increased zero emission miles with L2 EVSEs installed by SDG&E at driver homes (where feasible), as well as vehicle and fueling incentives. Exposing taxi, shuttle and rideshare companies and drivers to electric vehicles ("EVs") at this time will increase confidence in the technology, and knowledge about the relevant economic benefits, which will help to accelerate the widespread adoption of EV in this market.

3. Project Objectives, Market Segment and Vehicles Targeted

The project objective is to take the initial step necessary to expand the growth of TE in the following transportation markets: the greater San Diego region of Taxi Companies ("TC"), shuttle bus companies ("Shuttle") and Transportation Network Companies ("TNC" or "Rideshare"), as well as other for-hire transportation services interested in the transportation electrification of their fleet. This project proposes to supply grid integrated charging facilities to support the fueling needs of this transportation market segment. SDG&E proposes to install, own, operate, and maintain up to five grid integrated charging facilities ("project charging

facilities"), which will include one DCFC, and two L2 EVSEs per facility to address the fueling needs for the EVs with rapid charging DCFC capabilities, as well as for plug-in hybrid vehicles that do not have these capabilities. To maximize the volume of zero emission miles driven, as part of this project SDG&E will also install and own L2 EVSE at TC charging sites, shuttle charging sites and TNC driver homes (where feasible and applicable). Drivers with L2 home charging stations will also be enrolled in an applicable SDG&E Residential grid-integrated rate, which is described in Cynthia Fang's Chapter 5 testimony. The project also proposes to offer fueling incentives to maximize the number of zero emission miles driven by these vehicles, since there is evidence that there is the potential for them to drive 3 to 5 times more miles per day than the average passenger vehicle.[77] In addition, as part of this project proposal and described in Cynthia Fang's Chapter 5 testimony, SDG&E will seek approval of a public grid integrated rate. TC, TNC drivers, and shuttle companies will enroll in this rate as part of this project, which will be applicable only at project charging facilities. Finally, SDG&E proposes to work with qualified electric transportation service providers (and related third parties) to help fulfill the operational requirements for administering the grid integrated rate to facilitate the grid-integration of these charging loads with SDG&E's grid.

This project creates the opportunity to learn important aspects of this market in order to inform Commission policy as well as improve advancement from a pilot project to program scale, if deemed beneficial. The following are key learning objectives of this project:

[77] San Diego Offers Incentives for Alternative Fuel Taxicabs, Natural Gas Journal (January 2015), http://www.ngvjournal.com/san-diego-offers-incentives-for-alternative-fuel-taxis/.
SDAPCD and their 2015 airport taxi rebate program stating that taxis often travel more than 100,000 miles per year. SDG&E assumes that rideshare vehicles will drive a similar number of miles per year as a typical taxi in San Diego, which is 5 times more than the average passenger car per year, and as such, these higher mileage vehicles could yield a higher GHG reduction per EV taxi, shuttle or TNC vehicle.

Utilization Optimization – What the optimal charging facility-to-vehicle ratio should be for electric taxis, shuttles and rideshare vehicles to achieve high utilization rates, without creating inconvenience for the vehicle drivers.

Location Optimization – To what extent the charging facilities locations (identified based on input from the taxi, shuttle and the TNC community and businesses) are easily accessible, convenient and sufficient in volume and type of chargers to meet the operational requirements of these drivers.

Impact of the Grid Integrated Rate – To what extent the proposed grid integrated rate works to encourage off-peak charging among the taxi, shuttle and TNC driver community as well as to what extent these drivers will have the flexibility to select those hours of the day with the lowest energy prices.

EV Adoption – The degree to which driver exposure to EVs influences EV interest and adoption within the broader taxi, shuttle and rideshare community. Gathering data to help inform the total cost of ownership for fleet electrification is also key to EV adoption, particularly with taxi and shuttle fleets.

4. Vehicle Goals

The project addresses timely TE opportunities in the San Diego region, with implementation incentives designed to maximize the number of zero emission miles driven by these vehicles, with an estimated first year reduction of 769 $MTCO_2$, resulting in lifetime net CO_2 reductions of 12,032 MT, due to the addition of 4 EV taxis, 4 electric shuttles and 50 TNC vehicles.[78] Looking forward, the exposure to electrification is expected to jump-start the widespread adoption of EV in the years that follow the project in light of the total cost of ownership benefits realized due to the high mileage driven by this market segment. This project

[78] *See* the direct testimony of J.C. Martin (Chapter 8) for further details.

assumes that the introduction of EVs within the emerging TNC fleet at this time could help to accelerate EV adoption in this market near term.

5. Project Implementation

In developing the Green Taxi/Shuttle/Rideshare project, SDG&E has leveraged its experience regarding engineering design and the utilization of a grid integrated rate design. SDG&E's earlier EV rate research and its current experience with the use of grid integrated pricing with employee EV charging at SDG&E facilities, has prepared SDG&E to continue to explore vehicle-grid integration alternatives.[79] SDG&E is committed to leveraging its core competencies and capabilities to continue to explore grid optimization, and this project proposal embodies another opportunity to implement system efficiencies that provide benefits to ratepayers, while also maintaining a safe and reliable level of service.

To achieve these objectives, this project proposes to address market barriers that inhibit the adoption of EVs by TC, Shuttle and TNC fleet by providing:

- Availability and accessibility to charging facilities with DCFC to facilitate faster charging times that meet fueling and operational needs of this market segment, as well as L2 EVSE for vehicles that do not have DCFC capability.[80]
- Charging facilities conveniently located in areas of San Diego most frequently traveled by TC, Shuttle and TNC drivers with the expectations that these locations will facilitate the growth of EV adoption in TC, Shuttle and TNC fleets.

[79] Final Evaluation for San Diego Gas & Electric's Plug-in Electric Vehicle TOU, Pricing and Technology Study (February 2014), https://www.sdge.com/sites/default/files/documents/1681437983/SDGE%20EV%20%20Pricing%20&%20Tech%20Study.pdf

[80] Reported by Alejandro Zamorano, Bloomberg New Energy Finance, at the PEV Collaborative meeting on November 30, 2016, slide 41: "The number of trips that an EV can complete per day increases with charging power. Moving from 6.6 kW to 11 kW, or beyond, reduces charging time significantly." http://www.pevcollaborative.org/PEVC_meeting_november2016

- Opportunities for TC, Shuttles and TNC (and drivers) to reduce fueling costs by charging during off-peak, lower-priced hours of day offered through grid integrated pricing.
- Fueling incentives to maximize the number of zero emission miles driven by these vehicles.

The following describes how each of these transportation market segments (by vehicle type) will be addressed through this project:

a. **Green Taxis – Provides increased exposure to, and experience with EV taxi applications**[81]

- Partner with up to 4 Taxi Companies and/or independent taxi owners for their purchase of up to 4 EVs (one per taxi company/owner) with SDG&E providing a financial incentive of $10,000 per EV to closely approximate the taxi incentive offered in the 2010/2011 program.[82]
- Provide an EV fueling credit of $4,000 per EV for 12 months to be used at an SDG&E project charging facility designed to encourage each driver to maximize the number of zero emission miles driven, as well as helping to make these fueling dollars go further by charging during lower-priced, off-peak hours.
- Taxi drivers or Taxi Companies will enroll in SDG&E's grid integrated rate offering as a means for reducing fueling costs at SDG&E-owned project charging facilities; drivers will be notified in advance so they can plan their charging times to coincide with lower-priced, off-peak hours.

[81] Taxi owner / Taxi company are also eligible for a Clean Vehicle Rebate Project ("CVRP") rebate and federal tax credit for purchasing an EV.

[82] Reported by the Center for Sustainable Energy, in 2010/2011 the San Diego Airport Vehicle Rebate Program offered a $7,500 incentive to airport transportation providers to convert fleet to cleaner vehicle stock was met with success (e.g., 81 Taxi and 3 Shuttle Companies participated); the project taxi and shuttle incentive amount proposed reflects this value.

- Provide L2 EVSE installed by SDG&E at participating driver homes, where feasible, to facilitate charging when the EV is idle; taxi drivers who take their vehicle home will be required to sign up for SDG&E's residential grid integrated rate.
- Drivers who charge at home are eligible for SDG&E's annual EV Climate Credit.[83]

b. Green Shuttles – Provides increased exposure to, and experience with light duty electric shuttle bus applications[84]

- Partner with two or more Shuttle Companies to purchase up to 4 electric shuttles with SDG&E providing a financial incentive of $10,000 per electric shuttle, with no more than two incentives per Shuttle Company, for agreeing to participate in the project.
- The Shuttle Companies will have access to any of the project charging facilities installed through this project to serve TCs, Shuttles, and TNCs.
- The Shuttle Companies will enroll in SDG&E's grid integrated rate offering as a means for reducing fueling costs at SDG&E's project charging facilities; the shuttle company will be notified in advance so they can plan their charging times to coincide with lower-priced, off-peak hours.

[83] Approval of Advice Letter 2716-E: http://regarchive.sdge.com/tm2/pdf/2716-E.pdf (contains program description; the reference above to SDG&E's annual "EV Climate Credit" is referred to as "the LCFS credit" in the plan); and approval of the application by D.14-12-083, http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M143/K640/143640083.PDF.

[84] *See* https://www.californiahvip.org/docs/HVIP_Year4_EligibleVehicles.pdf for a description of eligible vehicles and incentives under the California Air Resources Board's Hybrid Voucher Incentive Program (HVIP).

c. Green TNC Vehicles – Increase the number of EV drivers within TNC fleet[85]

- Attract up to 50 TNC EV drivers to purchase or lease EVs through TNC programs or independently.
- Drivers will enroll in SDG&E's grid integrated rate offering as a means for reducing fueling costs at SDG&E's project charging facilities; drivers will be notified in advance so they can plan their charging times to coincide with lower-priced, off-peak hours.
- Provide TNC EV drivers with a "Zero Emissions Credit" on their SDG&E bill of $80 per every 1,300 kWh used as transportation fuel for the first 12 months; the driver earns these dollars as the volume of kWh consumed increases, which is designed to encourage each TNC EV driver to maximize the number of zero emission miles driven.[86]
- Where home charging is feasible, SDG&E will install a L2 EVSE for TNC EV drivers to facilitate charging when the EV is idle; TNC drivers who charge their vehicle at home will enroll in SDG&E's residential grid-integrated rate.
- Drivers who charge at home are eligible for SDG&E's annual EV Climate Credit.

The following table summarizes the project incentives and offerings by vehicle type, as described above (including federal and state incentives):

[85] *See* https://cleanvehiclerebate.org/eng for a description of eligible vehicles and incentives under the California Air Resources Board's Clean Vehicle Rebate Project (CVRP); and, *see* https://www.fueleconomy.gov/feg/taxevb.shtml for a description of Federal Tax Credits for All-Electric and Plug-in Hybrid Vehicles

[86] A "Zero Emissions Credit" type of incentive is more appropriate for TNC vehicles because unlike taxis, which are primarily dedicated to people movement, TNC vehicles are also for personal transportation use; as such, this credit is designed to maximize the use of the vehicle for TNC purposes.

Incentive / Offering	Vehicle / Driver Type		
	Taxi	Shuttle	TNC/Rideshare
Access to all project Charging Facilities	Yes	Yes	Yes
Vehicle purchase incentive of $10,000 each	Yes	Yes	
Vehicle fueling credit of $4,000 each for first 12 months	Yes		
Zero Emission Credit of $80 per 1,300 kWh consumed at project Facilities (first 12 months)			Yes
Installation of a home Level 2 charging equipment	Yes		Yes
Enrollment in applicable SDG&E residential grid-integrated rate	Yes		Yes
Eligible for SDG&E's annual LCFS EV Climate Credit on home bill (if car is charged at home)	Yes	Yes, if shuttles are charged at home	Yes
Enrollment in SDG&E's grid-integrated rate (used at project charging facilities)	Yes	Yes	Yes
CARB CVRP vehicle rebate (leased or purchased)	Yes		Yes
Federal Tax Credit (for purchased vehicle)	Yes		Yes
CARB HVIP incentive		Yes	

6. Project Architecture

Targeted site hosts will sign an easement and project agreement to allow their facility to be used for vehicle charging for those who participate in the project.[87] As noted above, SDG&E will build, own, operate and maintain these project facilities, as illustrated below. Immediately

[87] Similar to the approach described in D.16-01-045, http://www.sdge.com/regulatory-filing/10676/sdge-electric-vehicle-grid-integration-pilot-program.

after the Commission's approval of this project, SDG&E will continue to work with potential charging facility site hosts that will experience high utilization rates.[88]

As illustrated below, for one project charging facility, SDG&E will optimize the use of the solar and energy storage at the facility such that energy will be stored from the solar array, and the grid during off-peak (low-cost hours), and will discharge this energy to the charging facility during on-peak (high-cost hours), especially during critical-peak hours.

Figure 3-7 shows the architecture of a project site with L2 charging, DCFC, solar, and battery storage technology.

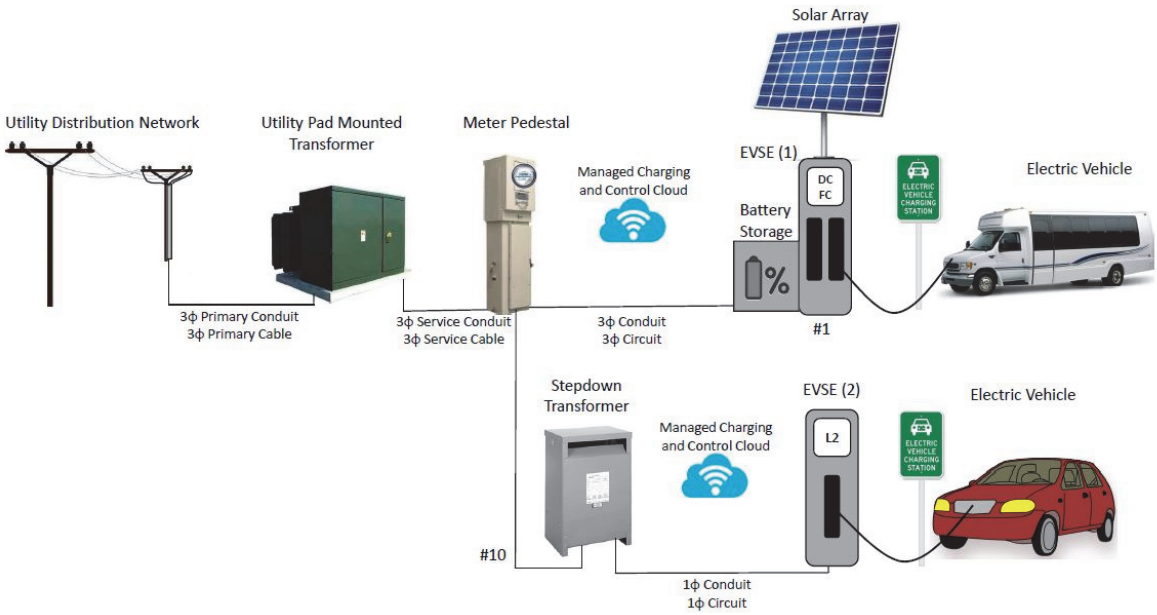

Figure 3-7: Charging Architecture with L2, DCFC, Solar, and Battery Storage Technology

7. Implementation Timeframe

The Green Taxi/Shuttle/Rideshare project will be implemented after CPUC approval, and data will be collected and reported on for a period of one year, once the vehicles are in service.

[88] For example, SDG&E is proposing to continue to work with the San Diego International Airport ("SDIA") to install the first two project charging facilities at the SDIA Taxi/Shuttle and TNC waiting lots.

As TCs, Shuttles and TNCs increase the adoption of electric transportation, SDG&E will install, own, operate, and maintain up to five grid integrated project charging facilities to serve these fleets. SDG&E is planning to install one of the five project charging facilities for every 10 TNC EVs that are added to the rideshare market.[89] As described below, the project charging facilities will be installed at locations that will have high utilization rates.

8. Project Partners

SDG&E has been discussing this project with potential TNCs, Shuttles and TCs to explore the feasibility of electric transportation alternatives, and to better understand related vehicle and charging (fueling) requirements. The Green Taxi/Shuttle/Rideshare project will require partnerships with, and participation from the following stakeholders:

Taxi Companies (TC) – SDG&E will work directly with taxi companies and their drivers, as well as independent taxi owners that express interest in electric transportation, and help educate them about the benefits of electric transportation. The project is targeting up to 4 EVs for TCs.

Transportation Network Companies (TNC) – Similarly, SDG&E will work with TNCs (and drivers) that express interest in operating EVs in SDG&E's service area to educate them about the benefits of transportation. The project is targeting up to 50 TNC EV drivers.

Shuttle Companies (Shuttles) – SDG&E has been working with the passenger shuttle community in San Diego, especially those that serve San Diego International Airport (SDIA) passengers and employees, to expand the awareness and benefits of electric transportation.

Automotive Manufacturers – SDG&E continues to work with automotive manufacturers, especially those with related rideshare oriented affiliations that express interest in

[89] Since the taxi and shuttle proposal is limited to "up to 4" vehicles each, and the TNC proposal will support "up to 50" vehicles, the rate of deployment of charging facilities will be scaled to the EV adoption rate of TNC EVs.

marketing EVs to TNC drivers (and other for-hire transportation) programs in SDG&E's service area to educate them about the benefits of electric transportation.

Site Hosts (project charging facility locations) – SDG&E will work with local agencies, organizations, municipalities and customers for the strategic deployment of up to five project charging facilities.[90]

Skilled Labor and SDG&E Crews – This project will involve working with skilled labor and SDG&E crews in providing engineering design, construction and charging facility maintenance. The IBEW provides specialized safety and technical training to its members for the installation of electric vehicle charging stations.

Electric Transportation Service Providers and Charging Equipment Suppliers – SDG&E will contract with qualified vendors who can provide the grid integrated functions to meet project requirements involving the use of dynamic energy pricing.

9. Leveraged Funding

As noted above, project participants will have the opportunity to take advantage of incentives and other funding sources as follows:

- California Vehicle Rebate Project (CVRP) – CARB program providing rebates for leased or purchased EVs
- EV Federal Tax Credits – applicable to EV purchases
- Hybrid Voucher Incentive Program (HVIP) – CARB program providing rebates for electric shuttle purchases (and other electric vehicles)

[90] Uber, https://www.uber.com/drive/san-diego/where-to-drive/.
Uber site reference to "hotspots" in the greater San Diego region – locations identified in this proposal reflect those with the greatest opportunity; and Uber, The Top 500 (2015), https://uber.totals.io/leaderboard?per_=page=500.
According to Uber's leaderboard the top 500 drivers drive a median range of 367 miles which indicates that a 200 mile range EV's with fast charging is a viable solution for even the top performers.

- SDG&E's EV Climate Credit – through the sale of Low Carbon Fuel Standards (LCFS) credits, the proceeds from these sales are available to all qualified SDG&E residential customers who drive an EV.

10. Stranded Asset Mitigation

Maximize Utilization Rates – SDG&E will mitigate the risk of stranded assets by ensuring that the rate of installation of the project charging facilities follows the rate of adoption of EVs by TCs, Shuttles and TNCs. Additionally, SDG&E will work toward ensuring that the locations selected for the installation of project charging facilities are accessible, convenient and expected to have high utilization rates. Project fueling incentives (noted above) are designed to increase the utilization of these charging facilities.

Scale Deployment to Meet Demand – SDG&E will work toward ensuring that the rate of installation of the project charging facilities follows the rate of adoption of EVs by TCs, Shuttles and TNCs. Specifically, since TNCs have less of an upper limit of adoption within this project, SDG&E is planning to install one of the five project charging facilities for every 10 TNC EVs adopted.[91] The installation of project charging facilities will only continue if the utilization rates are met or exceeded. The quantification of optimal project charging facility-to-vehicle ratio is one of the key learnings from this project.

Shared Project Charging Facilities – Because the project allows TCs, Shuttle and TNCs to share the same project charging facilities, this further reduces the risk of stranded assets, maximizes facility utilization, and increases the number of zero emission miles driven.

[91] SDG&E is targeting a minimum utilization rate of 10 charging sessions per day per charging facility.

B. Project Benefits

1. Grid Impacts

As noted above, the grid integrated rate offers a pricing solution in this project that provides customers choice in managing their fueling costs. When the load growth from EV charging is shifted to off-peak hours of the day, this improves the utilization of system assets, thereby generating benefits to all ratepayers through grid optimization, as well as the opportunity to integrate renewable energy resources. Please see Chapter 8 testimony of J.C. Martin for further discussion of the grid benefits of grid integrated vehicle charging.

2. Ratepayer Interest

The following benefits realized by SDG&E's Green Taxi/Shuttle/Rideshare Project are in the ratepayer's interest, and are consistent with Public Utility Code §740.8:

- High opportunity transportation segment (i.e., taxis, shuttle buses and TNC vehicles) will encourage the growth in the electrification of a segment of vehicles that have a high number of miles driven per day, and as such, offer larger reductions in GHG compared to conventional passenger vehicles;
- Reduction of health and environmental impacts from air pollution; TCs, Shuttles and TNCs serve and travel the entire region, and all communities enjoy the reduction in harmful air emissions; and
- Grid-optimization benefits all ratepayers by shifting flexible vehicle loads to off-peak times of day, reducing upward pressure on rates from expansion of utility capacity and resources to serve EV charging loads.

3. Emission Benefits and Accounting Methodology

GHG reductions from the Green Taxi/Shuttle/Rideshare Project provide air quality benefits for all ratepayers. First year reductions of 769 MT of CO_2 are estimated, resulting in lifetime net CO_2 reductions of 12,032 MT for the vehicles included in this project.[92]

C. Regulation Supported by the Project

1. California Agency Regulations Supported by the Project

This Project is aligned with the 2016 ZEV Action Plan, requiring the CARB and the Commission to explore zero emission transportation options.[93] This project supports the CARB's LCFS program.[94] The project also aligns with local and regional agencies and municipalities. This project allows the regional municipalities and local governments to achieve TE benefits currently featured within their respective Climate Action Plans.

2. CPUC Regulations and State Policy Supported by the Project

Air Quality Standards – This project aligns with and supports §§740.12, 740.3(a) and (c), and 740.8 as a means to achieve ambient air quality standards and the state's climate goals through widespread TE.

Net Benefits to Ratepayer – Consistent with §740.12(b), the Green Taxi / Shuttle / Rideshare project proposes to minimize overall costs and maximize overall benefits to all ratepayers through investments in grid integrated charging infrastructure.

Does Not Unfairly Compete – Partnering with third party electric transportation service providers in the implementation of this project helps ensure that it will not unfairly compete with

[92] *See* the direct testimony of J.C. Martin (Chapter 8) for further details.
[93] 2016 ZEV Action Plan, p. 16, https://www.gov.ca.gov/docs/2016_ZEV_Action_Plan.pdf.
Per the 2016 ZEV Action Plan, the CARB has the lead responsibility to "significantly increase consumer familiarity, knowledge and interest in ZEVs" by increasing the "familiarity of ZEVs by promoting ZEV use in car sharing services, rental car opportunities, and carpool and vanpool programs…[e]xpand targeted car sharing and van pooling in disadvantaged communities…beyond pilot projects."
[94] This sentence is referring to LCFS proceeds, under the EV Climate Credit program for residential customers.

nonutility enterprises as required under §740.3, and is in the interests of ratepayers as defined in §740.8. From a market share perspective, since this project is small in size, there should not be an impact on market concentration of DCFC. None of the existing public DCFC units offer any grid integrated functionality.

Safe, Reliable and Less Costly – As defined by §740.8, the Green Taxi / Shuttle / Rideshare project is in line with ratepayers' interests and will provide a safe, reliable and potentially less costly electrical service, consistent with §451, due to improved use of the electric system through grid-optimization.

D. Monitoring and Evaluation Plan

SDG&E's Monitoring and Evaluation Plan is focused on efficiently integrating the EV charging loads with the grid, in line with the Commission's interest in vehicle-grid integration within R.13-11-007,[95] as well as the 2016 ZEV Action Plan.[96] When the load growth from vehicle charging is shifted to off-peak hours through a grid integrated rate, this will improve the utilization of SDG&E system assets, thereby generating benefits to all ratepayers through grid optimization. The Monitoring and Evaluation Plan for this project will address the following:

- Can the grid integrated rate be effectively integrated within the daily operational requirements of TCs, Shuttles and TNCs;
- What factors positively influenced the growth of utilization rates of the DCFC and Level 2 charging facilities;

[95] "R.13-11-007, framework is outlined in the Energy Division's white paper, "Vehicle - Grid Integration: A Vision for Zero-Emission Transportation Interconnected throughout California's Electricity System, R.13-11-007 (March 2014) http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=7744."

[96] 2016 ZEV Action Plan, p.11, https://www.gov.ca.gov/docs/2016_ZEV_Action_Plan.pdf.

- What is the optimum ratio of DCFC and Level 2 charging facilities to TC, Shuttle and TNCs; and
- Did this project positively influence the growth in EV adoption among TNCs drivers, and EV drivers in general?

Once the project is underway, SDG&E expects that additional data points will be discovered and pursued.

E. Future Opportunities and Scalability

1. Near Term Scalability

Facility utilization indicators noted in this proposal will determine if expansion from the priority review project to a larger scale program should be considered by the Commission. For example, when the load shifting effects are realized with this project, and the growth of TE within TC, Shuttle and TNC fleet increases, then SDG&E will regard these impacts as an indication that a larger scale program is warranted. To keep pace with this expected market growth SDG&E is planning to submit another application to install additional charging facilities and support the growth in TC, Shuttle and TNC electrification in the years following this project.

F. Education and Outreach

The customer educational component will help potential participants develop an understanding of the grid and fuel cost savings benefits of the grid integrated rate, how the rate works at project charging facilities, understanding the SDG&E billing, advantages of charging at home under a grid integrated rate (where feasible), and other project benefits. Customer Engagement for this project includes customer outreach with potential site hosts, through company representatives, and an overarching, program-specific communication and education campaign (e.g., using social media, web and web tools, co-sponsored educational events and

collateral). Other forms of customer/driver engagement and education will take place in collaboration with relevant taxi, shuttle and TNC marketing programs.

G. Estimated Project Costs

The estimated cost of SDG&E's Green Taxi / Shuttle / Rideshare project is $3.5 million. See Appendix A, Table TX-1 for additional cost estimate details.

H. Conclusion and Summary

The Green Taxi/Shuttle/Rideshare project should be designated for priority review by the CPUC. The project meets the requirements set forth in the ACR. Specifically, the project is non-controversial in that it is relatively minor in scope and intended to kick start a wider market segment. Providing an operational proof of concept for this market segment is important in expanding this market. Second, the project is short term, and will not oversaturate the market. Finally, it is within the budget parameters to qualify for priority review.

VII. DEALERSHIP INCENTIVES PROJECT

A. Description and Features

1. Project Summary

Project Components	SDG&E's Dealership Incentives Project
Commission Review Mechanism	Priority Review
Objectives	Provide EV training, sale tactics, and cash incentives to local car dealerships and their salespeople to increase EV adoption.
Market Segment and Vehicles Targeted	People Movement; light-duty passenger vehicles
Vehicle Goals	1,500 added EVs (BEVs and PHEVs)
Implementation Timeframe	Enrollment and education from January 2018 until EV Day in September 2018 and one-year competition starting EV Day 2018 (scheduled September 2018).
Project Partners	Local car dealerships associated with the New Car Dealers Association of San Diego County or Auto Alliance. Outsource education and incentives project, tracking top sales, managing help desk, and administering a survey.
Leveraged Funding	Outreach efforts to dealerships by member associations. Best practices and curriculum from previous EV incentive reports and studies.
Stranded Asset Mitigation	None Applicable
Grid Impacts	Encourage residential grid integrated rate to minimize grid impacts.
Emissions Benefits & Accounting Methodology	GHG Emission Reduction: 2,517 $MTCO_2$/year[97]
CA Regulation Supported by Project	SB 32 SB 350 2016 ZEV Action Plan Executive Order B-30-15 Executive Order B-16-2012
CPUC Regulation Supported by Project	§740.12 §740.3(c)
Monitoring and Evaluation Plan	Monitor sales data and EV adoption to study effective EV training and education at local dealerships.
Cost	Estimated Cost: $1.8M

[97] *See* the direct testimony of J.C. Martin (Chapter 8) for further details.

2. Project Description

The Dealership Incentives Project promotes and advocates for EVs by providing education and incentives to those who may have influence in the car purchasing process: car dealerships and their salesforce. Since car dealerships are at the forefront and directly interact with customers who are contemplating a purchase or lease, there is an opportunity to increase the number of EVs leased or sold by encouraging the dealerships and their salespeople to promote EVs instead of traditional internal combustion engine ("ICE") vehicles through cash incentives.

Dealerships and their salespeople fill a number of functions that could facilitate or hinder the growth of the EV industry.[98] Research conducted by the University of California, Davis suggests these retailers serve a number of key functions important for EV sales: (1) ensuring the product matches the customer's driving profile, (2) articulating the unique value and relative advantages of EVs, and (3) enabling the customer to realize the promised value proposition through ongoing post-purchase support.[99] According to the Consumer Reports and Sierra Club findings, these needs are not currently being met.[100] Additional findings include: many dealers knew little about the plug-in EVs they sold, in some cases the salespeople outright discouraged customers from choosing a plug-in car over a gasoline car, and EV buyers rated dealers much

[98] New Car Dealers and Retail Innovation in California's Plug-in Vehicle Market (October 2014), p. 14,https://its.ucdavis.edu/research/publications/?frame=https%3A%2F%2Fitspubs.ucdavis.edu%2Findex.php%2Fresearch%2Fpublications%2Fpublication-detail%2F%3Fpub_id%3D2353.

[99] *Id.* at 14.

[100] Dealers Not Always Plugged in About Electric Cars (April 2014), http://www.consumerreports.org/cro/news/2014/04/dealers-not-always-plugged-in-about-electric-cars-secret-shopper-study-reveals/index.htm.

lower in sales satisfaction than conventional vehicle buyers. Dealers suggested better alignment of public incentives with sales practices and an incentive program as one solution.[101]

3. Project Objectives, Market Segment, and Vehicles Targeted

Car dealerships help create the EV customer experience. Research suggests there is insufficient EV training, poor salesperson EV knowledge, low retail satisfaction, and low commissions ($150-$200) [102] to encourage salespeople to sell an EV over an ICE vehicle.[103] Therefore, a $250 incentive to the salesperson as our program proposes, would be more than what they typically get and would in many cases motivate the salesperson to participate in the program. In addition, the timeline to sell or lease a battery electric vehicle ("BEV") or plug-in hybrid electric vehicle ("PHEV") takes considerably longer than their gas counterparts.[104] The longer duration of sales time in addition to lower commissions results in salespeople focusing on the sale of ICE vehicles over EVs, resulting in fewer EVs sold.

The 2016 Equinox Project, an initiative of the Center for Sustainable Energy ("CSE"), reported "many car shoppers interested in electric vehicles are facing dissuasion from car dealers" and that "[p]olicymakers and industry leaders should work together to provide education and incentives specifically for dealers, similar to what has been offered to consumers." [105] Without help from car dealerships and their salesforce, the ability to increase the number of electric miles driven in SDG&E's service territory is limited. A partnership between SDG&E and local car dealerships to collaborate on the best way to promote EV adoption has the ability to

[101] New Car Dealers and Retail Innovation in California's Plug-in Vehicle Market (October 2014), p. 17, https://its.ucdavis.edu/research/publications/?frame=https%3A%2F%2Fitspubs.ucdavis.edu%2Findex.php%2Fresearch%2Fpublications%2Fpublication-detail%2F%3Fpub_id%3D2353.
[102] *Id.* at 9.
[103] *Id*.
[104] *Id.* at 10.
[105] Center for Sustainable Energy Quality of Life Dashboard (2016), p. 23, https://energycenter.org/sites/default/files/2016-equinox-regional-dashboard-report.pdf.

influence customer behavior early in the car buying process and increase the number of light-duty passenger vehicles on the road. This will also create a more positive EV customer experience, which would in turn result in additional or repeated sales.

According to the Auto Alliance, sales figures confirm gasoline vehicles account for 94.7% of vehicles sold, with the other 5.3% made up of a combination of diesel, hybrid, BEV, and PHEV.[106] BEVs and PHEVs account for 0.41% and 0.25% of sales, respectively.[107]

4. Vehicle Goals

SDG&E's Dealership Incentives Project focuses on collaborating with dealerships and manufacturers to provide the necessary EV education and tools to their salespeople. SDG&E believes this will increase the sale of EVs in the SDG&E service territory. The project proposes to issue up to 1,500 incentives. It is anticipated that this would add 1,500 EVs on roads within SDG&E's service territory.

The goals of the Dealership Incentives Project are as follows:

- Provide any dealership within SDG&E's service territory that belongs to either the New Car Dealers Association of San Diego County or the Auto Alliance the opportunity to participate;
- Enroll approximately 200 salespeople;
- Emphasize EV sales in DACs;
- Provide dealerships certification programs that educate the dealerships and their salespeople on EV information and the best EV sale practices;

[106] Energy Efficient Autos: More Choice for Consumers, Alliance of Automobile Manufacturers (2015), http://www.autoalliance.org/cars-move-america/energy-efficient-autos-more-choice-for-consumers.
[107] *Id*.

- Issue incentive payments to car dealerships ($250) and their associated employees ($250) (for a total incentive of $500) for the increase of new EV sales or leases; and
- Educate new EV owners to sign up for SDG&E's residential grid integrated rate, which incentivizes off-peak charging that minimizes grid impacts and ultimately reduces greenhouse gas ("GHG") emissions.

5. Project Architecture

SDG&E will work with local dealerships to collaborate on the architecture of the Dealership Incentives Project. Once developed, dealerships will be notified about the project via e-mail from the New Car Dealers Association of San Diego County or The Auto Alliance. In order to participate, each dealership and their associated salespeople will take an online or in-person training course. This certification will include information on the following: (1) the benefits of driving electric, (2) how to easily describe the benefits of driving electric during the sales process, and (3) how to sign-up drivers for a residential grid integrated rate with SDG&E. Once certified, the salesperson will register online with SDG&E to participate in the project and begin receiving incentives. A help desk will be made available to the dealerships and their salespeople to answer questions about the project.

After a salesperson is registered, they will be eligible to start receiving their incentives when the project is active. In order to request an incentive payment, a salesperson must provide information details about the sale or lease, including the vehicle identification number (VIN) and copies of designated proof-of-sale documents. All efforts will be made to streamline the submission process so the salesperson can complete it within a few minutes. Details regarding incentive disbursements and tracking will be developed in collaboration with key stakeholders.

6. Implementation Timeframe

Approval of the Dealership Incentives Project is requested by late 2017 in order to begin dealership collaboration, project development, and enrollment and education of dealerships and salespeople starting in early 2018. This will allow for sufficient time between enrollment and education, and the beginning of the competition. The project's competition will commence on National Drive Electric Week's Electric Vehicle Day ("EV Day") in 2018, which is usually towards the middle of September. EV Day is the San Diego region's most heavily attended EV ride-and-drive event by community residents and dealerships, as illustrated by EV Day 2016 that included attendance by over 1,100 people and 792 test drives.[108] It is expected that coordinating the start of this project with EV Day will positively impact the effort. The project will run for one year following EV Day in September 2018. Following project completion, a survey will be conducted with drivers and dealership personnel to analyze the effectiveness of the project.

7. Project Partners

The Dealership Incentives Project will require partnerships with a number of stakeholders within the EV manufacturing and dealership industry. Dealerships and their salesforce are at the forefront and directly interact with the customers. The Dealership Incentives Project will be made available to any dealership within SDG&E's territory that completes the project's certification and belongs to either the New Car Dealers Association of San Diego County or Auto Alliance. These organizations will market the Dealership Incentives Project to their members.

SDG&E proposes to contract with a third-party by issuing a RFP to provide the following:

[108] National Drive Electric Week, Electric Vehicle Day - San Diego (2016), https://driveelectricweek.org/event.php?eventid=701.

- Manage the project, including the competition portion, tracking top sales, and operating the help desk to answer any questions that participants may have;
- Administer a survey to drivers and the dealerships upon project completion to measure the project's success; and
- Provide information on the best EV sales practices based on current and prior dealership training programs.

SDG&E has been working with vehicle manufacturers, local auto salespeople, and car dealerships for more than six years, and has been involved with policy, grid-friendly rate innovation, dealership engagement, customer engagement, and education and outreach efforts within the EV industry. With this experience, SDG&E will play a vital role in overseeing the project. This includes being the point of contact for each of the project partners, participating in dealership training, aggregating partner results and reporting results to the Commission and project stakeholders.

8. Leveraged Funding

SDG&E will leverage the best practices of previous dealership incentive programs to developed the project in collaboration with local dealerships.

9. Stranded Asset Mitigation

This project poses no risk of physical stranded assets if no EVs are sold, since the incentives would be paid after sales are made. However, if the incentive project is successful and all incentives are paid out, then there would potentially be 1,500 new EVs on the road with associated GHG emission reductions.

B. Project Benefits

1. Grid Impacts

A core component of the project is to educate car dealerships and their salespeople on the benefits of driving electric, such as informing the EV drivers of SDG&E's grid integrated residential rate. The grid integrated rate is used to incentivize drivers to charge at times of the day when the grid is impacted the least to avoid the expenditures necessary for additional generation and transmission/distribution assets that may be needed if EV charging load contributed to peak demand.[109]

2. Ratepayer Interest

According to the New Car Dealers Association of San Diego County,[110] car dealership jobs have not only increased for the fifth consecutive year, but the jobs created also remain in San Diego County, which provides substantial economic benefits for the region as a whole. Ratepayers should benefit from this project by creating an EV-educated dealership workforce that will remain local to San Diego.

In addition to local job creation the project will help to reduce local GHG emissions. One of the most important benefits of having more EVs in neighborhoods and on freeways is that they will help to reduce GHG and other harmful emissions for all SDG&E ratepayers. Furthermore, adding flexible load to the grid can help promote charging at times of day during optimal grid conditions and can therefore put downward pressure on rates.

[109] *See* the direct testimony of J.C. Martin (Chapter 8) for further details.
[110] New Car Dealers Association of San Diego County, 2016 Economic Impact Report, http://www.ncda.com/wp-content/uploads/2014/07/San-Diego-New-Car-Dealer-Economic-Impact-Report-2016.pdf.

One key component of the project will be to focus on dealerships that are either located within or adjacent to DACs. An additional education component will be added for these dealerships about special EV incentives and financing for those with low to moderate incomes.

The goal will be to ensure that salespeople are aware of the various incentives that make purchasing an EV more affordable. For example, low and moderate-income consumers can receive an additional $2,000 rebate compared to the standard rebate incentive by the Clean Vehicle Rebate Project.[111]

3. Emissions Benefits and Accounting Methodology

Light-duty vehicles comprise 97%[112] of all registered vehicles in San Diego County and are responsible for approximately 80%[113] of combined on-road and off-road GHG emissions. GHG reductions from the Dealership Incentives Project will target this large market segment and provide air quality benefits for all ratepayers resulting in increased health and improved quality of life.[114] First year reductions of 2,517 $MTCO_2$ are estimated, resulting in lifetime net CO_2 reductions of 41,346 MT for the vehicles included in the Dealership Incentives Project.[115]

Since the distribution of EVs are being concentrated in California, a project such as the Dealership Incentives Project could be scaled beyond SDG&E's territory to help meet state goals.

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[111] Center for Sustainable Energy & the California Air Resources Board, Income Eligibility, California Clean Vehicle Rebate Project (2016), https://cleanvehiclerebate.org/eng/income-eligibility.
[112] Proprietary IHS/Polk Data (2016).
[113] San Diego County Updated GHG Emissions Inventory (March 2013), p. 8 http://catcher.sandiego.edu/items/usdlaw/EPIC-GHG-2013.pdf. 80% is derived by adding the 2010 values for light-duty vehicles (7.0) and passenger vehicles (5.9) for a total of 12.9 $MMTCO_2e$; adding on-road transportation (14.4) and off-road transportation (1.4) for a total of 15.8 $MMTCO_2e$; and then taking the total light-duty vehicles (12.9) over combined on-road and off-road transportation (15.8) comes out to approximately 80%.
[114] Center for Sustainable Energy Quality of Life Dashboard (2016), p. 8, https://energycenter.org/sites/default/files/2016-equinox-regional-dashboard-report.pdf.
[115] *See* the direct testimony of J.C. Martin (Chapter 8).

C. Regulation Supported by the Project

1. California Agency Regulations Supported by the Project

The Dealership Incentives project will support a variety of California regulation in addition to SB 350, such as:

- SB 32: Reduction of GHG emissions to approximately 15 percent below emissions expected under a "business as usual" scenario;
- 2016 ZEV Action Plan: 1.5 million ZEVs in California by 2025;[116] and
- California Executive Order B-30-15: Decrease GHG emissions to 40% below 1990 levels by 2030 and 80% below 1990 levels by 2050.

2. CPUC Regulations Supported by the Project

The Dealerships Incentives Project supports §740.12 by stimulating innovation and competition by EV manufacturers, attracting more private capital investments in TE, and creating high quality jobs for Californians. The project also supports §740.3(c), since it is in the ratepayers' interest and will not unfairly compete with nonutility enterprises.

D. Monitoring and Evaluation Plan

Following the project, a study will be conducted to evaluate the project's success. In August 2016, the Sierra Club, an environmental organization, surveyed the customer experience at 300 dealerships and learned that dealerships' knowledge of EVs, the way EVs were displayed in the dealerships and the inventory all varied widely.[117] This project will be used as a baseline to determine if after one year the Dealership Incentives Project increased the sale of electric cars within SDG&E's territory.

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[116] 2016 ZEV Action Plan, https://www.gov.ca.gov/docs/2016_ZEV_Action_Plan.pdf.
[117] Multi-State Study of the Electric Vehicle Shopping Experience (2016), https://www.sierraclub.org/sites/www.sierraclub.org/files/uploads-wysiwig/1371%20Rev%20Up%20EVs%20Report_09_web%20FINAL.pdf.

Additionally, the study will monitor and report how many drivers have signed up for SDG&E's residential grid integrated rate during the project period. When applicable, new car owners will be encouraged to sign-up for SDG&E's residential grid integrated rate, which incentivizes customers to charge at times of day when the price of electricity is at its lowest and grid impact is minimized.

E. Future Opportunities/Scalability

There are many ways the Dealership Incentives Project can be scaled. It can be offered over numerous years, the amount of incentives can be increased or decreased per year, and the geographic area where the project takes place can be expanded to the state and national level. The project's online platform for dealerships can be offered and repeated in each of these scalability scenarios. According to the New Car Dealers Association of San Diego County,[118] 2015 was the fifth consecutive year that car dealers in the association increased the number of employees, totaling more than 14,000 full-time and part-time employees. With SDG&E's project goal of 200 salespeople, this project has scalability opportunities in San Diego alone. Expanding the project to the state and national level will provide future opportunities to add many more EVs on the road. SDG&E's plan is to leverage lessons learned with the project and integrate these lessons into future education and outreach efforts.

F. Education and Outreach

The Dealership Incentives Project's education and outreach effort will focus on collaboration with dealerships, manufacturers and salespeople. Developing the right partnerships and setting the suitable criteria for success together with dealerships will help optimize the design of the project. The education and outreach effort will include best practices such as:

[118] New Car Dealers Association of San Diego County, 2016 Economic Impact Report, http://www.ncda.com/wp-content/uploads/2014/07/San-Diego-New-Car-Dealer-Economic-Impact-Report-2016.pdf.

- Developing relationships with local dealership associations: Dealership associations have a wide network of contacts and can help raise awareness and disseminate information. They can help customize an incentive program to fit the needs of the dealerships in SDG&E's service territory.
- Developing an awards event to engage media and highlight successes: Dealerships are motivated by publicity and invest in advertising and other marketing efforts to increase their sales. In fact, car dealers in the New Car Dealers Association of San Diego County spent more than $112 million to advertise their dealerships in 2015, which is an increase of nearly $8 million as compared to 2014.[119] Offering an opportunity to raise their business profile in the media will encourage buy-in and participation in the effort. Therefore, SDG&E plans to launch a competition between the dealerships and feature the leaders online. For example, Connecticut's dealership incentive program offered two awards that were tailored to dealerships of different sizes.[120]
- Rewarding dealerships for supporting EVs beyond the point of sale: The California "Governor's Environmental and Economic Leadership Award" is an example of how recognizing not only EV sales, but efforts such as salespeople training, outreach, infrastructure deployment, and post-sale support of EVs can improve the customer's experience.[121]

[119] *Id*.
[120] The Connecticut Department of Energy and Environmental Protection and Connecticut Automotive Retailers Association's Connecticut Revolutionary Dealer Award.
[121] California Governor's Environmental and Economic Leadership Award, http://www.calepa.ca.gov/Awards/GEELA/.

G. Estimated Project Costs

The estimated cost of the SDG&E Dealership Incentives project is $1.8M. See Appendix A, Table DI-1 for additional cost estimate details.

H. Conclusion and Summary

The Dealership Incentive Project should be designated for priority review by the Commission. The project meets the requirements set forth in the ACR. Specifically, the project is non-controversial in that it is relatively minor in scope. The project will incent the EV market as a whole and will benefit a wide range of participants in the EV industry. Second, the project is short term and will be deployed within one year. Finally, it is within the budget parameters to qualify for priority review.

VIII. STATEMENT OF QUALIFICATIONS

My name is Randall L. Schimka. My business address is 8306 Century Park Court, San Diego, California 92123. I am employed by SDG&E as a Project Manager in Clean Transportation.

I have over 30 years of energy industry experience. My current duties involve project management to support SDG&E's electric transportation efforts, including electric vehicle charging in residential, workplace, and public locations, including utility interface with service providers wanting to install this equipment. I also contribute to our Clean Transportation education and outreach efforts for electric vehicle customers, and am the proud owner of two battery electric vehicles. In addition to driving an EV on a daily basis, I have driven over 15,000 miles on various EV road trips using public charging since 2016.

Prior duties at SDG&E focused on transmission grid control systems, transmission system cyber security, NERC and CIP reliability standards, distribution system reliability, substation engineering, and project management.

My education is in the general area of electrical engineering and business. I graduated from San Diego State University in 1985 (BS Electrical Engineering), 1990 (MS Electrical Engineering), and 1992 (Executive MBA). I am a registered Electrical Engineer in the State of California.

I have previously testified before the California Public Utilities Commission.

APPENDIX A – DETAILED PROJECT COSTS

Priority Review Project: Electrify Local Highways (ELH)
Appendix Table ELH-1

Total Costs

	CapEx	O&M	Total
Transformer & Install	$ 147,000	$ 3,316	
Electrical Service	$ 559,372	$ -	
EVSE Costs	$ 1,757,728	$ 32,472	
Purchased and SD Software	$ 845,112	$ -	
Customer Engagement	$ -	$ 200,000	
Measurement & Evaluation	$ -	$ 250,000	
Billing Support	$ -	$ 80,000	
SDG&E Clean Transportation PM	$ -	$ 100,000	
First Year O&M Service Calls	$ -	$ 15,000	
First year O&M for charging equipment	$ -	$ 10,000	
	$ 3,309,212	$ 690,788	$ 4,000,000

Priority Review Project: Dealership Incentives (DI)
Appendix Table DI-1

Total Costs

	CapEx	O&M	Total
Program Incentive payments (1500 @ $500 each)		$ 750,000	
Program Education for Dealerships		$ 382,250	
Payment Processing and Help Desk		$ 97,750	
Consumer Program Outreach		$ 115,000	
Car Dealer Program Outreach		$ 115,000	
Manufacturer Program Outreach		$ 115,000	
End of Program Survey/Report		$ 115,000	
SDG&E Clean Transportation Proj. Mgmt		$ 100,000	
	$ -	$ 1,790,000	$ 1,790,000

Priority Review Project: MD/HD Port Electrification (PE)
Appendix Table PE-1

Total Costs

	CapEx	O&M	Total
Transformer & Install	$ -	$ -	
Electrical Service	$ 849,570	$ -	
EVSE Costs	$ 991,005	$ -	
Purchased and SD Software	$ -	$ -	
Measurement & Evaluation	$ -	$ 150,000	
Education and Outreach	$ -	$ 110,000	
Billing Support	$ -	$ 80,000	
SDG&E Clean Transportation PM	$ -	$ 200,000	
First Year O&M Service Calls	$ -	$ 15,000	
First year O&M for charging equipment	$ -	$ 10,000	
	$ 1,840,575	$ 565,000	$ 2,405,575

Priority Review Project: Fleet Delivery Services (FDS)
Appendix Table FDS-1

Total Costs

	CapEx	O&M	Total
Transformer & Install	$ 248,625	$ 3,731	
Electrical Service	$ 829,323	$ -	
EVSE Costs	$ 1,531,215	$ 35,055	
Purchased and SD Software	$ 622,800	$ -	
Measurement & Evaluation	$ -	$ 200,000	
Charging Equipment Maintenance	$ -	$ 15,000	
Billing Support	$ -	$ 80,000	
SDG&E Clean Transportation PM	$ -	$ 100,000	
First Year O&M Service Calls	$ -	$ 15,000	
First year O&M for chrg equip	$ -	$ 10,000	
	$ 3,231,963	$ 458,786	$ 3,690,749

Priority Review Project: Taxi / Rideshare / Shuttle (TX)
Appendix Table TX-1

Total Costs

	CapEx	O&M	Total
Transformer & Install	$ 75,100	$ 2,073	
Electrical Service	$ 440,865	$ -	
EVSE Costs	$ 1,317,522	$ 1,845	
Purchased and SD Software	$ 622,800	$ -	
Shuttle Incentives		$ 40,000	
Taxi Incentives		$ 40,000	
Taxi Fueling Incentives		$ 16,000	
Zero emission credits		$ 96,000	
Customer Engagement		$ 200,000	
Measurement & Evaluation		$ 410,000	
Billing Support		$ 80,000	
SDG&E Clean Transportation PM		$ 100,000	
First Year O&M Service Calls		$ 15,000	
First Year O&M for chrg equip		$ 10,000	
	$ 2,456,287	$ 1,010,918	$ 3,467,205

Priority Review Project: Airport GSE (GSE)
Appendix Table GSE-1

Total Costs

	CapEx	O&M	Total
Transformer & Install	$ -	$ -	
Electrical Service	$ 912,333	$ -	
EVSE Costs	$ 1,493,265	$ 22,140	
Purchased and SD Software	$ -	$ -	
Measurement & Evaluation	$ -	$ 200,000	
Billing Support		$ 80,000	
SDG&E Clean Transportation PM		$ 100,000	
First Year O&M Labor		$ 22,000	
First Year O&M Material		$ 10,000	
	$ 2,405,598	$ 434,140	$ 2,839,738