

Application: _____

Exhibit No.: SDGE-_____

Witness: Hannon J. Rasool_____

PREPARED TESTIMONY OF
HANNON J. RASOOL
ON BEHALF OF SAN DIEGO GAS & ELECTRIC COMPANY
CHAPTER 2



BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

JANUARY 22, 2018

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**PREPARED TESTIMONY OF
HANNON J. RASOOL
CHAPTER 2**

**I. MEDIUM-DUTY AND HEAVY-DUTY ELECTRIC VEHICLE CHARGING
INFRASTRUCTURE PROGRAM**

A. Program Overview

The purpose of my direct testimony is to discuss in detail San Diego Gas & Electric Company’s (“SDG&E”) Medium-Duty and Heavy-Duty Electric Vehicle Charging Infrastructure Program (“MD/HD EV Charging Infrastructure Program” or “Program”). The proposed program is a multi-year infrastructure program commencing upon California Public Utilities Commission (“CPUC” or “Commission”) approval. The Program will provide electric vehicle (“EV”) charging infrastructure to support a range of vehicles with a focus on Class 2 through Class 8 vehicles.¹ The Program will also provide infrastructure to support electric forklifts and electric transport refrigeration units (“TRUs”). Class 2 – Class 8 EVs, forklifts and TRUs will collectively be referred to as the “Target Vehicles.”

The MD/HD EV Charging Infrastructure Program will support the goals of Senate Bill (“SB”) 350, SB 32, accelerate transportation electrification (“TE”), provide greenhouse gas (“GHG”) emissions reduction benefits, provide local emissions reduction benefits, provide sales growth for EV manufacturers, equipment providers and electric vehicle service providers (“EVSPs”), provide local skilled labor employment for installation and maintenance of charging equipment, and positively impact disadvantaged communities (“DACs”).

¹ Class 2 through Class 8 vehicles are those with a gross vehicle weight rating (“GVWR”) of 6,001 pounds or more.

1 **1. Program Summary**

2 **TABLE 1**

3

Program Components	SDG&E’s MD/HD EV Charging Infrastructure Program
Commission Review Mechanism	Standard Review
Objectives	Support the goals of Senate Bill 350 and Senate Bill 32; accelerate and enable widespread transportation electrification; deploy charging infrastructure to support Class 2 through Class 8 electric vehicles, forklifts and transport refrigeration units in SDG&E’s service territory; reduce greenhouse gas emissions, reduce local pollution; enable a robust EV market, and support disadvantaged communities.
Market Segment and Vehicles Targeted	Class 2 – Class 8 electric vehicles, forklifts and transport refrigeration units.
Vehicle Goals	Install electric vehicle charging infrastructure to support approximately 3,100 electric vehicles.
Implementation Timeframe	Multi-year program. Program participant sign-up period of five-years.
Potential Project Partners	North County Transit District, Sysco Corporation, United Parcel Service, Ace Parking Management, Inc, Amazon.com, Caltrans/SANDAG Otay Mesa East Port of Entry Project, San Diego Unified Port District.
Leveraged Funding	<p>Program participants will procure and operate electric vehicles. Program participants will pay for the incremental cost of the charging station in excess of the allowance.</p> <p>SDG&E will focus efforts to create partnerships and assist in pursuit of grants and other leveraged funding such as the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (“HVIP”) and the VW Diesel Settlement.</p>
Stranded Asset Mitigation	SDG&E will install charging infrastructure contingent on commitments from program participants to procure and operate electric vehicles as part of their operations.
Grid Impacts	Load management plans will be created to help mitigate grid impacts while supporting the needs of the program participant’s daily business operations.
Emissions Benefits	Estimated GHG reduction: 42,709 metric tons of CO ₂ e per year of full deployment; 476,552 metric tons of CO ₂ e over the vehicle lifetime.
Cost	Estimated Direct Cost: \$150.6 M

1 **2. Program Description**

2 SDG&E’s MD/HD EV Charging Infrastructure Program will accelerate the adoption of
3 EVs in SDG&E’s service territory by reducing significant barriers and providing support to
4 customers. The Program will provide charging infrastructure to support Class 2 through Class 8
5 EVs and off-road vehicles such as forklifts and TRUs – the Target Vehicles.

6 SDG&E will install, maintain and own the infrastructure up to the electric vehicle supply
7 equipment (“EVSE”).² This is referred to as the “make-ready” infrastructure. The program
8 participant will have the option to have SDG&E own and maintain the EVSE or elect to own and
9 maintain the EVSE themselves. Under the utility ownership model, SDG&E will own and
10 maintain the EVSE on behalf of the customer. Under the customer-owned model, the customer
11 will own the EVSE; SDG&E will require EVSPs to provide extended warranties or maintenance
12 packages, in addition to their standard warranties.

13 Under both models, an allowance will be given to the program participant to be applied
14 towards the cost of the EVSE. The program participant will be responsible for paying the EVSE
15 cost in excess of the allowance.³

16 The allowance amount will be based on the median cost of networked EVSEs that are
17 qualified and contracted for the Program and support the vehicle’s power needs. Table 2 below
18 displays vehicle weight class groupings, the vehicle power requirements and illustrative
19 allowances associated with the power requirement capability. The allowances were determined

² EVSE and charger are often used interchangeably.

³ The allowance will not exceed the cost of the EVSE selected by the customer. For example, if the selected EVSE is \$1,000, but the allowance is \$1,500, then the customer will not be allowed to “pocket” the additional \$500.

1 by conducting an examination of EVs by class, their power requirements and available EVSEs.
2 The allowance correlates with the power output requirement.

3 **TABLE 2**

Vehicle Weight Class	Power Requirement	Illustrative Allowance for <i>Networked</i> EVSE
Class 2 – 3	10 kW	\$1,000
Class 4 – 5	20 kW	\$1,800
Class 6	50 kW	\$35,000
Class 7 – 8	100 kW	\$45,000
On-Route Chargers	350 kW	\$200,000
Forklift or TRU	Various	\$2,000

4
5 The allowance amounts will be set upon conducting a request for proposal (“RFP”) using
6 data collected at the time of program execution using actual negotiated contracted prices.
7 SDG&E will set the allowance amount using a median cost approach. Adjustments may be
8 made to the median cost based on actual RFP data. This flexibility is meant to account for
9 various options and features among EVSEs which does not always allow for an apples to apples
10 comparison based on only EVSE power output.

11 The allowance will be adjusted downward over time. The percentage of EVSE cost
12 covered by the allowance is based on the vehicle type, the year of program sign-up by the
13 program participant and whether the vehicle is located in, or travels through, a DAC. The
14 allowance amount will be adjusted based on the program year as depicted in Table 3. SDG&E
15 will utilize a declining allowance percentage as follows:
16

1

TABLE 3

	Allowance Percentage for Cost of EVSE
Year 1 (non-DAC)	100%
Year 2 (non-DAC)	90%
Year 3 (non-DAC)	80%
Year 4 (non-DAC)	70%
Year 5 (non-DAC)	60%
DAC	100% regardless of year
Transit and School Bus	100% regardless of year
Forklift or TRU	Flat \$2,000 regardless of year

2 The declining allowance percentage is intended to encourage early participation and
3 accelerate adoption.

4 DACs are often the most impacted by local air pollution. Therefore, the Program will
5 provide greater support in DACs by maintaining a 100% allowance in all years in order to help
6 reduce GHGs and local emissions. The percentage allowance for transit and school buses will
7 not decline either. Transit buses provide a public service that support local communities and
8 those who may not have other means of transportation. The forklift and TRU EVSE allowance
9 will remain at \$2,000 per charger for the duration of the Program. This amount is set towards the
10 lower end of charger costs for this segment.

11 **3. Program Objectives, Market Segment and Vehicles Targeted**

12 The Program’s objectives are to support the goals of SB 350, SB 32, accelerate TE,
13 reduce GHGs, reduce local emissions and local air pollution, support DACs, support SDG&E’s
14 customers and reduce barriers to TE. Current barriers include the cost of charging

1 infrastructure,⁴ the cost of the vehicle, insufficient education and lack of familiarity with EV
2 technology. While SDG&E cannot eliminate all barriers, it can be part of the solution and enable
3 the market by reducing the barriers of the lack of infrastructure and education.

4 The Program will support Class 2 through Class 8 electric vehicles. In addition, certain
5 forklifts are eligible for participation in the Program. Participation of forklifts in the Program
6 will be limited to certain innovative EV technologies and to customers who have not yet adopted
7 electric forklifts in high quantities. To be eligible for the Program, the customer must satisfy one
8 of the following: (1) utilize fast-charge capable equipment, (2) heavy-lift capacity forklifts
9 (greater than 8,000 pounds lift capacity), or (3) be a customer whose forklift fleet contains less
10 than 25% of electric forklifts as part of the total forklift fleet. The Program will not include
11 Class III electric forklifts – non-ride-on forklifts (e.g., pallet jacks, hand trucks). Class III
12 forklifts are hand operated forklifts as opposed to ride-on and are not available in combustion
13 engine configurations.

14 TRUs are also eligible for the Program. TRUs are defined as refrigeration systems that
15 are powered by internal combustion engines (inside the unit housing). They control the
16 environment of temperature-sensitive products, such as food, that are transported in refrigerated
17 trucks and trailers. According to the California Air Resources Board’s (“CARB”) website,
18 California needs to reduce public health risk from TRUs near distribution centers and other
19 facilities where TRUs and TRU generator sets congregate.⁵

⁴ The California Transit Association identifies the upfront capital costs of charging infrastructure as one of the key barriers to electrification of the public transit sector. A.17-01-020, et al., *Opening Brief of California Transit Association on the Priority Review Transportation Electrification Proposals From San Diego Gas & Electric, Southern California Edison, and Pacific Gas and Electric* (June 16, 2017) at p. 4.

⁵ Available at: <https://www.arb.ca.gov/cc/cold-storage/cold-storage.htm>.

1 SDG&E will work with transit agencies and other entities utilizing transit type buses to
2 support their conversion to electric buses. For the purposes of the Program, transit buses are
3 defined broadly to include buses that are operated by transit agencies but also buses operated by
4 other organizations including universities, airports and tourist locations.

5 Transit buses are ripe for conversion as evidenced by various commitments throughout
6 California to convert to 100% electric fleets. This includes commitments by Antelope Valley
7 Transit Authority (100% electric fleet by the end of fiscal year 2018),⁶ Foothill Transit (all
8 electric fleet by 2030)⁷ and most recently a commitment by Los Angeles Metropolitan
9 Transportation Authority⁸ to convert to 100% electricity use by 2030.⁹

10 **4. Vehicle Goals / Scope / Program Size**

11 The Program will provide charging infrastructure to support approximately 3,100 Target
12 Vehicles. As part of the Program, up to 225 EVSEs will be available to support electric forklifts
13 and TRUs. The forklift and TRU allotment is a cap, not a dedicated carve-out.

14 The Program is designed to be flexible and customer driven. It is not prescriptive in that
15 it does not require any specific targets by vehicle class. SDG&E will support customers based
16 upon their commitment to procure and use EVs in their operations. Customer commitment will
17 be evidenced by an EV purchase order or other tangible manifestation of their EV utilization
18 commitment.

⁶ Available at: <http://www.avta.com/index.aspx?page=482>.

⁷ Available at: <http://foothilltransit.org/news/sustainability/electric-program/>.

⁸ LA Metro operates over 2,400 buses.

⁹ Available at: <http://losangeles.cbslocal.com/2017/07/27/metro-buses-electric-by-2030/> ; LA Metro October 19, 2017 Board Meeting.

1 The scope and size of the Program is based on the number of commercial vehicles in
2 SDG&E’s service territory, fleet sizes and California’s goals. These factors shaped the Program
3 in a manner that takes into consideration San Diego’s customer base and one which begins the
4 process of enabling these market segments. There are approximately 103,000 Class 2 – Class 8
5 commercial vehicles in SDG&E’s service territory.¹⁰ SDG&E’s program targets a small fraction
6 of the population – approximately 3% of SDG&E service territory population.

7 The Program will advance California’s transportation electrification goals in the medium-
8 duty and heavy-duty vehicle segments. This includes the goals articulated in Executive Order
9 (“EO”) B-32-15 which orders state agencies to develop an integrated action plan that establishes
10 clear targets to improve freight efficiency, transition to zero-emission technologies, and increase
11 competitiveness of California's freight system.¹¹ This is further articulated in the California
12 Sustainable Freight Action Plan which states the following: Transition to Zero Emission
13 Technology Target - Deploy over 100,000 freight vehicles and equipment capable of zero
14 emission operation and maximize near-zero emission freight vehicles and equipment powered by
15 renewable energy by 2030.¹²

16 The Program is aligned with California’s funding efforts as evidenced by the increased
17 funding of the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (“HVIP”).
18 HVIP funding is described in Section I.A.8. Leveraged Funding below.

¹⁰ Proprietary IHS/Polk Data (June 2016).

¹¹ Executive Order B-32-15, dated July 17, 2015.

¹² *California Sustainable Freight Action Plan*, July 2016, at p. 10. Available at:
http://casustainablefreight.org/documents/PlanElements/Main%20Document_FINAL_07272016.pdf.

1 **5. Program Architecture**

2 SDG&E’s program supports customer choice. Upon favorable Commission approval,
3 SDG&E will install, maintain and own EV charging infrastructure up to the EVSE. This is often
4 referred to as the make-ready component of the infrastructure. The program participant will
5 have the option to have SDG&E own and maintain the EVSE or elect to own and maintain the
6 EVSE themselves. Under both ownership scenarios, SDG&E will install the EVSE utilizing
7 trained electricians. Construction, installation and maintenance contractors will have Electric
8 Vehicle Infrastructure Training Program (“EVITP”) certification, and SDG&E will require that
9 all construction, installation and maintenance of EVSE charging facilities that is not performed
10 by employees of SDG&E shall be performed by contractors signatory to the International
11 Brotherhood of Electrical Workers (“IBEW”) who hold valid C-10 contractor’s licenses, as
12 defined in the governing labor agreement between SDG&E and the IBEW.

13 Program participants will be able to select an EVSE that has been qualified and approved
14 by SDG&E to meet minimum safety standards¹³ and metering accuracy. EVSPs will have the
15 opportunity to respond to SDG&E’s RFP and submit their products for testing. SDG&E will
16 consider factors such as if the EVSE has networking and metering capabilities. Networked
17 EVSEs are preferred because this will allow for additional options as new rates become available
18 and allow for communication capabilities.

¹³ UL certified equipment or successfully passing Nationally Recognized Testing Lab testing. See Decision (“D.”) 18-01-024, *Decision on the Transportation Electrification Priority Review Projects*, dated January 11, 2018, pp. 98-99 (stating that provisions from Safety Requirements Checklist (currently in draft form, available at <http://www.cpuc.ca.gov/sb350te>) that are applicable to MD and HD EVs will be applied.).

1 In order to support TE and respond to the needs of SDG&E's customers there will be an
2 exception/waiver to the standard qualifying process in certain instances.¹⁴ By having the
3 discretion to assist a wide range of customers and support their EV procurement decisions the
4 process will encourage innovation and competition by vehicle manufacturers and EVSE
5 manufacturers.

6 Transformers, conduit, cable, concrete foundations, meters and any other electrical
7 equipment required to support TE will be provided and installed. SDG&E will contract with
8 qualified third parties to provide the charging equipment and trained contractors to provide the
9 skilled labor for installation. Installation will be conducted consistent with D.18-01-024, the
10 *Decision on the Transportation Electrification Priority Review Projects*, approved on January
11 11, 2018.¹⁵ Installation costs per location will vary due to the power requirements based on
12 number of vehicles per location and class of vehicles being deployed. SDG&E will examine
13 each deployment on a case by case basis in order to maximize GHG reduction and manage the
14 program budget.

15 Customer choice is a vital component of the Program, therefore program participants will
16 be given options. As previously stated, they will be able to own and maintain the EVSE or elect
17 to have SDG&E own and maintain the EVSE. In addition, the program participant may elect (1)
18 new, separately metered electric service for the EV load or (2) have the EV load comingled with
19 the customer's overall electrical load. Load research meters will give insight and data to the

¹⁴ For example, if there is a proprietary EVSE for a particular vehicle that is not networked or if the vehicle can provide some or all of the functionality envisioned with a networked EVSE, then SDG&E may, at SDG&E's discretion, waive the requirement. Also, if the vehicle manufacturer uses a proprietary charging station then there may not be any other options to support that particular EV.

¹⁵ D.18-01-024, pp. 98-99 (Priority Review Projects Safety Requirements Checklist (currently in draft form is available at <http://www.cpuc.ca.gov/sb350te>)).

1 customer by disaggregating the demand and energy usage at the EVSE level. This will allow the
2 program participant to better understand how much energy is being used to fuel the vehicle (i.e.,
3 help them understand their electric fuel cost).

4 The Program also includes on-route high powered chargers to support electric transit
5 buses.¹⁶ On-route chargers can operate at approximately 350 kW to 500 kW. They can each
6 support numerous transit buses that pass the on-route charger. Typically, they will be installed at
7 transit hubs where bus routes and possibly other forms of mass transit (i.e. San Diego rail
8 system) converge.¹⁷ Buses will layover at the location for a period of minutes and receive a
9 high-powered charge. On-route chargers can allow a transit bus with a relatively small battery to
10 run continuously throughout the day.

11 **6. Implementation Timeframe**

12 The Program is a multi-year program commencing upon final Commission approval.
13 The sign-up period will last for up to five years once the Program opens for program participant
14 sign-up. However, some of the installation may occur after the sign-up period has ended.

15 **7. Potential Program Partners**

16 SDG&E will build upon partnerships to help accelerate a transition to zero emission EVs.
17 SDG&E will collaborate with program participants, potential participants and local and state
18 stakeholders to reduce barriers to TE, advance technology solutions for EVs, optimize the grid
19 and share best practices.

20 SDG&E and North County Transit District (“NCTD”) have been engaged in discussions
21 to advance electric bus adoption in SDG&E’s service territory. NCTD has received funding

¹⁶ The Program budget includes ten on-route chargers.

¹⁷ Over ten transit hubs are located in SDG&E’s service territory. However, more than one on-route charger may be installed at a given hub.

1 from the Low Carbon Transit Operations Program for the procurement of two zero emission
2 buses. They have indicated that SDG&E's support through the provision of infrastructure is
3 critical to NCTD's plans to adopt zero emission buses.

4 SDG&E has also had discussions with San Diego Metropolitan Transit System ("MTS"),
5 San Diego International Airport, Balboa Park, the San Diego Zoo and the Living Coast
6 Discovery Center ("LCDC") to discuss electric buses. SDG&E will continue to collaborate with
7 these parties and others to help accelerate the adoption of electric transportation.

8 In addition to bus operators, SDG&E has had on-going discussions with Sysco
9 Corporation, United Parcel Service ("UPS"), Ace Parking Management, Inc., Amazon.com, local
10 forklift operators, California vehicle manufacturers and others.

11 SDG&E has met with Caltrans, SANDAG and the Otay Mesa Chamber of Commerce to
12 discuss the Otay Mesa East Port of Entry ("POE") project. This is a new POE which will be
13 approximately 2.5 miles east of the current Otay Mesa POE. Both POEs will accommodate
14 medium-duty and heavy-duty vehicles. The Otay Mesa East POE design will include emerging
15 technologies aimed at reducing border crossing wait times, traffic congestion, and vehicular
16 emissions. This presents a unique opportunity for SDG&E, which is the only California electric
17 utility located near an international border, to help reduce transportation emissions associated
18 with cross border goods movement. SDG&E will continue to collaborate with Caltrans,
19 SANDAG and local communities to find ways to electrify these vehicles.

20 Vehicle procurement is a long-term investment. Reducing barriers, such as the cost of
21 charging infrastructure, for program participants is imperative so they choose EVs sooner than
22 they might otherwise. This will enable California to reduce GHGs and local pollutants more
23 rapidly than would occur without the Program. Procurement of internal combustion engine

1 vehicles today means that they will be on the road emitting GHGs and local air pollution for
2 years to come.

3 **8. Leveraged Funding**

4 Program participants will procure the EVs and pay the incremental cost above the EVSE
5 allowance amount. Leveraged funding will come from the program participant's procurement of
6 EVs, as EV procurement is a significant expense. Requiring customers to pay for new
7 infrastructure as well as the incremental upfront cost of an EV can be prohibitive. In addition,
8 participants are taking on the task of learning how to operate, maintain and integrate EVs into
9 their fleet and into their business operations.

10 Without this leveraged funding by program participants the cost of the Program would
11 increase and TE may not occur at the pace required to meet the GHG reduction goals of
12 California. In addition, program participants are providing access to their property through
13 easements or other forms of legal agreement.

14 SDG&E will collaborate with program participants to leverage non-ratepayer funds
15 including grants and incentive programs. This includes sources such as U.S. Department of
16 Energy, Federal Transit Administration, VW Diesel Settlement, the California Energy
17 Commission and CARB, including HVIP. The most recent HVIP funding (Fiscal Year 2017-18)
18 saw an increase to \$180 million from the previous annual funding of \$36 million. Of the \$180
19 million allocation, \$35 million must be set aside to fund zero-emission buses.¹⁸

¹⁸ CARB Discussion Draft Funding Plan (November 9, 2017) at p. I-78, available at:
https://www.arb.ca.gov/msprog/aqip/fundplan/1718_draft_funding_plan_workshop_100417.pdf.

1 **9. Stranded Asset Mitigation**

2 SDG&E is focused on ensuring that EV charging equipment is utilized. To mitigate the
3 risk of stranded assets, SDG&E will not deploy EV charging assets until the program participant
4 commits to procure and operate EVs. This approach will be taken with all program participants
5 to ensure asset utilization.

6 As a practical matter, program participants are businesses who rely on their vehicles to
7 keep their businesses running. Given that program participants will be making a significant
8 investment in the vehicle, granting access to their property and paying the incremental cost
9 above the EVSE allowance amount, it is unlikely that they would then abandon the assets.
10 Therefore, by the design of the program SDG&E is mitigating the potential for stranded assets.

11 **B. Program Benefits**

12 **1. Ratepayer Interest**

13 TE benefits all ratepayers through GHG emissions reduction and cleaner local air. As
14 discussed in greater detail in the direct testimony of Linda P. Brown (Chapter 1 - Section III),
15 electrification of MD and HD vehicles can particularly benefit DACs. Further, supporting the
16 deployment of zero emission vehicles through this program will help expand the use of EVs and
17 encourage technological advancements.

18 Local emissions reduction benefits those who drive and ride in the EV as well as those
19 located where the vehicle travels. For example, electrifying transit and school buses helps those
20 who utilize this public service but it also benefits ratepayers who do not take advantage of public
21 transit. Those who do not ride the vehicle still benefit by reduced pollution being emitted where

1 EVs travel and idle. TE adoption grants health and environmental benefits to the local
2 community by reducing GHG emissions.¹⁹

3 Program participants will be required to submit a load management plan with the goal of
4 efficiently integrating the new load with the grid, thereby generating benefits to all ratepayers
5 through grid optimization. A load management plan is a proactive measure that considers the
6 new EV load and articulates a plan to integrate it with the grid and avoid adverse bill impacts.
7 Load management plans can be used to educate customers and to encourage them to charge their
8 vehicles at times of low grid utilization and/or high renewable energy generation.

9 Load management plans are a benefit to the program participant and also beneficial to
10 ratepayers. They provide a benefit to the program participant by requiring them to examine how
11 the new load may impact their electric utility bill. This can be an important tool to help manage
12 customer bills by proactively considering how charging behavior impacts bills.

13 Load management plans are beneficial to ratepayers because through education program
14 participants will understand that adding to peak demand can increase their customer bill and
15 adding to peak demand can ultimately result in infrastructure upgrades. Educating customers to
16 avoid charging their EVs during certain hours or time periods will make it more likely that they
17 are engaged stewards of the grid. They may primarily make EV charging decisions for the
18 personal benefit of lower electricity bills but this action will also benefit the grid and ratepayers
19 as a whole.

¹⁹ *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/>.

1 **2. Grid Impacts and Grid Utilization Benefits**

2 EV load must be managed in a manner that limits negative impacts to the circuit and
3 system grid. As discussed above, SDG&E will coordinate with the program participant to create
4 a load management plan to help reduce charging during on-peak time periods.

5 If the new load is integrated effectively it will increase the load factor which means that
6 existing assets are being utilized efficiently. If not managed with foresight the new load could
7 result in costly upgrades. Grid optimization measures and efficient integration of new load will
8 help mitigate impacts to the circuit’s peak load and the demands on the system overall. This
9 provides an opportunity to mitigate the need for upgrades to SDG&E’s distribution system and
10 the need for additional generation capacity to meet increased peak conditions. Utilizing existing
11 generation, such as renewable energy, is a benefit of managed EV load.

12 The unique benefit of EV load is that it is flexible load. This provides an opportunity that
13 is not always found with other loads. The flexibility varies by vehicle type, customer class and
14 the needs of the end-use customer. Proactively planning for increased load and leveraging the
15 flexibility of EV load can benefit the system and all ratepayers.

16 **3. Disadvantaged Communities**

17 The Program will target DACs for EVSE deployment. SDG&E’s goal is to deploy 40%
18 of installations to support DACs. This includes both where vehicles are housed when they are
19 not operating but also where vehicles travel and emit tailpipe emissions. SDG&E defines a DAC
20 consistent with the definition approved in Decision (“D.”) 16-01-045.²⁰ The latest iteration of
21 the CalEnviroScreen, version 3.0, will be used.

²⁰ In D.16-01-045 (p. 138), the Commission found that it was “reasonable to define eligible [DACs] as the top quartile of census tracts as identified by CalEnviroScreen on either a state-wide or a utility-wide basis, whichever is broader.” The Commission approved SDG&E’s Advice Letter (“AL”) 2876-

1 **4. Job Creation**

2 Programs that support EV adoption will create California jobs. The Program will provide
3 job opportunities via contracting for installation of the charging infrastructure. In order to satisfy
4 the demand of the Program, SDG&E will contract with multiple IBEW-affiliated contractors.

5 Several companies have built manufacturing facilities in California to produce clean
6 buses, trucks and components.²¹ Proterra has a headquarters in Burlingame, CA that conducts
7 battery engineering and research and development efforts as well as a manufacturing facility in
8 City of Industry, CA. Build Your Dream (“BYD”) has a manufacturing facility in Lancaster,
9 CA. The Lion Electric Company, an electric school bus manufacturer, has plans to build a
10 facility in California.²² TransPower has a facility in Escondido, CA where they retrofit medium
11 and heavy-duty vehicles.

12 **5. Emissions Benefits**

13 The Program will support approximately 3,100 electric vehicles. It is expected to result
14 in an estimated GHG emission reduction of 42,709 MT CO₂e per year. The Program is expected
15 to result in GHG emissions reduction of 476,552 MT CO₂e over the lifetime of the vehicles.
16 Additional details regarding GHG reduction and criteria emissions reductions are available in the
17 direct testimony of J.C. Martin (Chapter 7).

E, in which SDG&E determined that the utility-wide basis was broader (approved April 28, 2016, effective March 31, 2016).

²¹ Union of Concerned Scientists and Greenlining Institute. *Delivering Opportunity: How Electric Buses and Trucks Can Create Jobs and Improve Public Health in California* (May 2017), at p. 6. Available at: <https://www.ucsusa.org/sites/default/files/attach/2016/10/UCS-Electric-Buses-Report.pdf>.

²² California Governor’s Office of Business and Economic Development press release, February 1, 2017; <http://www.business.ca.gov/Newsroom/ArticleId/14/officials-from-go-biz-and-quebec-unveil-all-electric-school-bus-in-palo-alto>.

1 **C. Monitoring and Evaluation Plan**

2 SDG&E will monitor and evaluate the Program to refine best practices in supporting TE.
3 Data collection, data analysis, metering data and the experience of program participants will be
4 leveraged to advance TE.

5 In addition, SDG&E will collaborate with program participants to help determine the
6 total cost of ownership (“TCO”) of EVs versus their incumbent vehicles. TCO will take into
7 consideration the electricity rates of SDG&E, the operating characteristics and environment of
8 SDG&E’s service territory and vehicle costs. TCO will be refined over time as EV prices and
9 other factors evolve. TCO analysis will help inform operators and ideally accelerate the
10 adoption of EVs.

11 SDG&E will examine how best to support program participants in a manner that
12 mitigates adverse impacts to the grid while allowing operators to support their core business.
13 SDG&E will share its analysis and results on an on-going basis through annual reports and
14 through the existing Program Advisory Council (“PAC”).

15 **D. Education and Outreach**

16 SDG&E will conduct targeted education and outreach to businesses, transit agencies and
17 fleet managers in the region. SDG&E will leverage internal resources, account executives and
18 relationships to engage with potential participants. This will be supplemented with targeted
19 outreach to operators of Target Vehicles.

20 Education and outreach is essential to help fleet managers and decision makers more
21 comfortable moving to a new technology with which they likely have limited experience.
22 Potential program participants need to understand the potential fuel and maintenance savings.

23 SDG&E will convene workshops that will allow program participants and prospective
24 participants to meet with each other. SDG&E will lead discussions regarding the benefits and

challenges of TE. Additional topics may include education on rates, available EVs in the market and their abilities and limitations, presentation of case studies, and discussion on available analytic and fleet management tools. This will allow stakeholders to learn from each other and interact with those who they trust as fellow fleet operators.

E. Estimated Program Costs

The estimated cost of SDG&E’s MD/HD EV Charging Infrastructure Program is \$150.6M in direct costs. The cost estimate was created using a given number of vehicles per vehicle weight class segment (e.g., Class 2-3, Class 4-5, etc). However, actual EVSE deployment will be driven by customer demand rather than the EVSE count used for cost estimate purposes. Tables 4 and 5 below detail the direct cost components.

TABLE 4: 100% Utility Ownership of EVSEs

SDG&E After Sales Tax, Unloaded, Unescalated, Direct Cost Estimate for Medium-Duty and Heavy-Duty Electric Vehicle Charging Infrastructure Program		
	Capital	O&M
Engineering and Design	18,307,355	
Trench and Conduit	26,569,945	
Wire and Installation	10,478,150	
Switch Gear / Meters	14,504,076	
Program and Project Management	5,988,539	
Charger/EVSE - Utility Owned	34,421,600	
Transformer	15,071,400	
Charger/EVSE - Allowance - Customer Owned		0
Customer Engagement		2,675,000
Measurement and Evaluation		428,571
Charger/EVSE Maintenance/Warranty		1,854,464
Tax and Contingency	20,267,956	0
Subtotal	145,609,021	4,958,035
Program Total	150,567,056	

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TABLE 5: 50% Utility Ownership of EVSEs

SDG&E After Sales Tax, Unloaded, Unescalated, Direct Cost Estimate for Medium-Duty and Heavy-Duty Electric Vehicle Charging Infrastructure Program		
	Capital	O&M
Engineering and Design	18,307,355	
Trench and Conduit	26,569,945	
Wire and Installation	10,478,150	
Switch Gear / Meters	14,504,076	
Program and Project Management	5,988,539	
Charger/EVSE - Utility Owned	17,210,800	
Transformer	15,071,400	
Charger/EVSE - Allowance - Customer Owned		17,210,800
Customer Engagement		2,675,000
Measurement and Evaluation		428,571
Charger/EVSE Maintenance/Warranty		1,854,464
Tax and Contingency	20,267,956	0
Subtotal	128,398,221	22,168,835
Program Total	150,567,056	

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II. CONCLUSION AND SUMMARY

SDG&E respectfully requests that the CPUC approve the Program as proposed.

Transportation electrification of this market segment will help reduce greenhouse gases, reduce local pollution from vehicle tailpipes and support cleaner air in disadvantaged communities.

This concludes my prepared direct testimony.

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1 **III. STATEMENT OF QUALIFICATIONS**

2 My name is Hannon J. Rasool and my business address is 8306 Century Park Ct., San
3 Diego, CA 92123. I am currently the Clean Transportation Development Manager for San Diego
4 Gas & Electric Company, a position that I have held for approximately one and one-half years. I
5 was a member of SDG&E’s Regulatory Affairs Department for seven years prior to joining the
6 Clean Transportation Department. In Regulatory Affairs, I worked on a range of proceedings
7 including electric vehicles, energy storage, net energy metering and others. I received my
8 undergraduate degree in Marketing at the University of Iowa and my law degree from California
9 Western School of Law. I am an active member of The State Bar of California.

10 I have not previously testified before the California Public Utilities Commission.

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