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

PREPARED DIRECT TESTIMONY OF

MICHAEL M. SCHNEIDER

ON BEHALF OF SAN DIEGO GAS & ELECTRIC COMPANY

CHAPTER 1

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

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CHAPTER 1

I. INTRODUCTION

California's climate change policies are the most innovative and aggressive in the nation. In order to meet the goals established by Assembly Bill ("AB") 32 and accelerated in Senate Bill ("SB") 32, the State will have to seek new ways to reduce greenhouse gas ("GHG") emissions. According to the California Air Resources Board ("CARB"), the transportation sector accounts for 36% of all GHG emissions.[1] In San Diego Gas & Electric Company's ("SDG&E") service territory (which has less manufacturing, mining and agriculture electricity demand compared to the rest of the state),[2] transportation accounts for approximately 50% of all GHG emissions.[3] Light-duty vehicles in particular comprise 97%[4] of all registered vehicles in San Diego County and are responsible for approximately 80%[5] of combined on-road and off-road GHG emissions. In addition, recent studies have shown the degradation of air quality in San Diego County, culminating with the American Lung Association's recent grade of "F" in air quality for San

[1] CARB GHG Inventory (2014), p. 2, https://www.arb.ca.gov/cc/inventory/pubs/reports/2000_2014/ghg_inventory_trends_00-14_20160617.pdf.

[2] Compares California Energy Commission ("CEC") IEPR (2015) Mid-Case forecasted electricity sales by sector (Form 1.1B) SDG&E and Statewide, http://www.energy.ca.gov/2015_energypolicy/documents/2015-12-17_mid_case_final_baseline_demand_forecast.php.

[3] EPIC San Diego County Updated GHG Emissions Inventory (2013), p. 3, http://catcher.sandiego.edu/items/usdlaw/EPIC-GHG-2013.pdf.

[4] Proprietary IHS/Polk Data (2016).

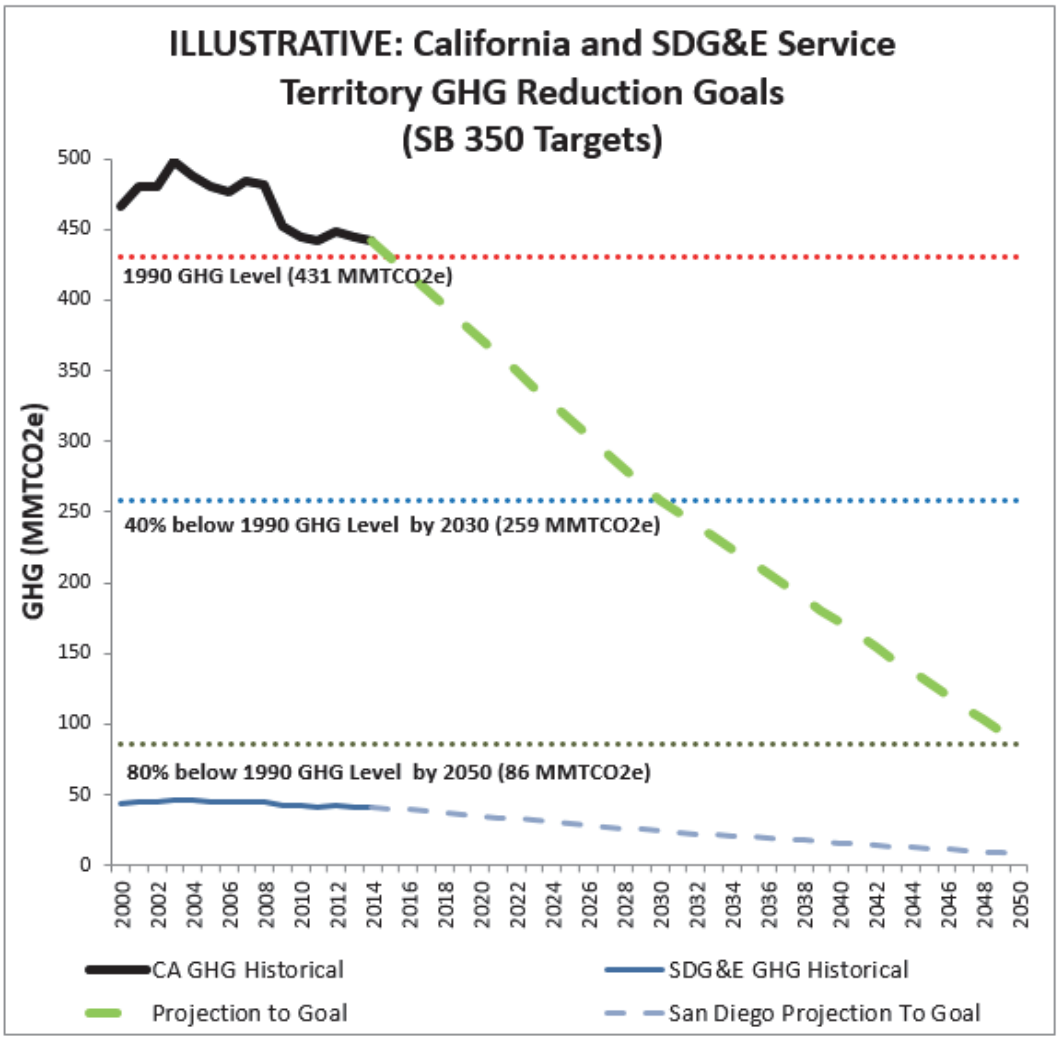
[5] EPIC San Diego County Updated GHG Emissions Inventory (2013), p. 8, http://catcher.sandiego.edu/items/usdlaw/EPIC-GHG-2013.pdf. Details regarding how the 80% was calculated are included in the direct testimony of Randy Schimka (Chapter 3).

Diego County in the organization's 2016 "State of the Air" report.[6] Therefore, SDG&E's service territory represents a prime target for GHG reduction.

Mass adoption of electric vehicles ("EVs") is a viable and necessary step to meeting climate and air quality goals. Electric utilities should play a major role in developing the grid integrated charging infrastructure needed to reach mass adoption. Chart 1-1 below compares estimated historical emissions for California and SDG&E's service territory and illustrates the emissions trajectory based on California's GHG goals. It demonstrates the swift response that is needed to reduce GHG emissions.

[6] American Lung Association (2016), http://www.lung.org/our-initiatives/healthy-air/sota/city-rankings/states/california/.

Chart 1-1



SB 350 recognizes that transportation is both a major source of GHG emissions and a critical tool in reducing those emissions. California Public Utilities Code ("P.U. Code") §740.12, which was added by SB 350, codifies this recognition as follows:

> (A) Advanced clean vehicles and fuels are needed to reduce petroleum use, to meet air quality standards, to improve public health, and to achieve greenhouse gas reduction goals.
>
> …

(D) Reducing greenhouse gas emissions to 40 percent below 1990 levels by 2030 and to 80 percent below 1990 levels by 2050 will require widespread transportation electrification.

P.U. Code §740.12 also recognizes the critical role utilities will play:

(E) Widespread transportation electrification requires electrical corporations to increase access to the use of electricity as a transportation fuel.

SDG&E is excited to submit this application ("Application") to facilitate widespread transportation electrification ("TE"), consistent with SB 350 and the guidance provided by Commissioner Peterman in the "Assigned Commissioner's Ruling Regarding the Filing of the Transportation Electrification Applications Pursuant to Senate Bill 350" ("ACR").[7] The Governor, Legislature and California Public Utilities Commission ("CPUC" or "Commission") have all recognized that TE is one of the most effective means to reach GHG reduction goals and other priority environmental policies. In Executive Order ("EO") B-16-2012 and the State's first ZEV Action Plan in 2013, Governor Brown set a target of deploying grid integrated charging infrastructure to serve 1 million zero-emission vehicles ("ZEVs") by 2020 and a goal of 1.5 million ZEVs on California roads by 2025. While there is much enthusiasm for the growing number of EVs sold, it is clear that without significant new investment and innovation, California will fall far short of both its TE and GHG goals. For example, recent failures in the private sector charging industry related to bankruptcy and equipment reliability issues show that new approaches are necessary.

The Commission took up the challenge presented by the Governor, the Legislature and other stakeholders in 2016, approving pilot programs of limited scope and duration for the three

[7] Issued in R.13-11-007 on September 14, 2016.

investor-owned electric utilities. SDG&E thanks the Commission for their thoughtful consideration and approval of its Vehicle-Grid Integration Pilot Program, since rebranded as Power Your Drive, and looks forward to delivering outstanding results as the program enters the deployment phase.[8] SDG&E also appreciates the Commission's interest in testing different approaches to TE and hopes this Application (and those of the other utilities) provides innovative strategies and tools that will lead to an inflection point in the EV market that will set California on a path to achieve its ambitious TE goals.

In order to contribute to achieving the State's climate change and TE policies, SDG&E views its mission in this area as maximizing GHG reductions and minimizing overall costs while enabling the EV market and continuing to provide safe and reliable power at reasonable rates. This mission supports SDG&E's broader overarching mission to be the cleanest, safest and most reliable energy company in America. SDG&E believes that its TE goals can best be accomplished by ensuring that EV charging is widespread and easily accessible, leveraging existing infrastructure whenever possible, taking full advantage of renewable energy and avoiding the dispatch of costly, inefficient or high GHG-emitting generation. The grid optimization proposals contained in this Application are intended to achieve these objectives and benefit not only EV drivers/owners, but all ratepayers, the EV industry and the overall economy, and, of course, the environment.

II. SUMMARY OF SDG&E'S SHORT TERM (PRIORITY REVIEW AND STANDARD REVIEW PROPOSALS) AND LONG TERM TE GOALS

As summarized below and described in more detail in the supporting testimony, SDG&E's proposals cover a wide diversity of transportation sectors, including goods movement,

[8] Approved in Decision ("D.") 16-01-045.

people movement and in-home charging. SDG&E's proposals seek to invest in infrastructure, implement grid integrated rates, leverage and provide new opportunities for competitive equipment and service providers, partner with institutions and entities seeking support to deploy EV charging, ensure public safety, and protect ratepayers. Consistent with Commissioner Peterman's ACR, this Application includes both relatively small projects that can be implemented quickly and a more extensive residential charging program that may require additional review. SDG&E also hopes to file applications for additional TE programs in the coming months, which are also briefly described below.

Priority Review Projects

- **Airport Ground Support Equipment** – SDG&E proposes to install charging ports, metering equipment, and data loggers in partnership with the San Diego International Airport and its tenants.
- **Electrify Local Highways** – SDG&E proposes to install Level 2 ("L2") and DC Fast Chargers ("DCFCs") located in or near disadvantaged communities ("DACs") at four Caltrans Park-and-Ride locations with existing plans for new construction and upgrades. A grid integrated rate will be offered to encourage charging at times beneficial to the grid.
- **Medium Duty/Heavy Duty (MD/HD) and Forklift Port Electrification** – SDG&E proposes to install a combination of components such as electric vehicle supply equipment ("EVSE"), circuits, load research meters and data loggers, in collaboration with the San Diego Unified Port District ("Port District") and its tenants.

- **Fleet Delivery Services –** SDG&E proposes to install charging infrastructure to support electric delivery vehicles at approximately six locations. A grid integrated rate will be offered to encourage charging at times beneficial to the grid.
- **Green Taxi/Shuttle/Rideshare** – SDG&E proposes to provide charging infrastructure and vehicle incentives with a grid integrated rate to encourage taxi owners/companies, shuttle bus owners/companies, and rideshare drivers/companies to lease or purchase EVs. One of the five DCFC units proposed within this project will be integrated with energy storage and solar energy.
- **Dealership Incentives** – SDG&E proposes to offer EV education and incentives to dealerships and their salespeople to increase EV sales and enhance the associated customer experience.

Standard Review Program

- **Residential Charging Program** – SDG&E proposes a residential charging program that will not only target SDG&E residential customers who have purchased or leased a ZEV[9] to encourage efficient charging under dynamic pricing, but customers who are contemplating purchasing a ZEV. This program will cover the cost of an in-home L2 EVSE and a capped amount of installation and maintenance services by qualified electrical contractors affiliated with the International Brotherhood of Electrical Workers ("IBEW"). In turn, program

[9] According to the ZEV Action Plan, ZEVs include the following electric vehicle types: hydrogen fuel cell electric vehicles ("FCEVs") and plug-in electric vehicles ("PEVs"), which includes pure battery electric vehicles ("BEVs") and plug-in hybrid electric vehicles ("PHEVs"). Note, FCEVs are not included in SDG&E's proposals or in any analysis related to ZEVs included in this Application.

participants will be required to sign up for a residential grid integration rate for the entire residence, which will help facilitate managed energy usage on SDG&E's electric grid. Enrollments in the program are proposed to take place over five years, with a goal of 90,000 L2 EVSEs installed, including at least 20% of total installations specifically set aside for DACs.

Consistent with the ACR and SB 350, the proposed priority review projects and residential charging program serve ratepayer interests[10] by:

- providing improved air quality and other environmental benefits, GHG reductions and increased use of alternative fuel, while at the same time improving the efficient use of the electric grid and increasing integration of renewable energy resources;
- filling and/or jump starting sectors within the EV market not significantly developed or lacking infrastructure or capital investment;
- increasing EV-related demand (e.g., increased EV adoption, increased need for charging infrastructure, need for data on charging patterns, increased need for a trained and qualified EV-related workforce) will create incremental jobs and new opportunities for private sector participation in the market;
- facilitating both safe and equitable access to electricity as a transportation fuel, including for those living in DACs, while improving the efficient use of SDG&E's electric system;
- providing data that will help test and measure the flexibility of EV charging loads and the degree to which the efficient integration of EV loads can yield cost

[10] In accordance with P.U. Code §§740.3, 740.8, and 740.12.

savings to all customers by avoiding future utility infrastructure additions or more efficient operation of the grid; and

- educating residential and commercial customers currently lacking the knowledge or experience necessary to reach the conclusion that investment in transportation electrification is economical, safe and good for the public at large.

SDG&E believes that all these objectives are consistent with Federal, State and regional policy objectives regarding transportation electrification, including those reflected in SB 350.

The goals of the proposed projects and residential charging program are consistent with SDG&E's long term TE goals, which include:

- comprehensive rollout of 150,000[11] EVs in SDG&E's service territory by 2025 – a seven-fold increase from 2016;[12]
- increased access to TE, including but not limited to charging infrastructure and vehicles, across all transportation segments;
- enhanced grid integrated electric charging infrastructure to meet new TE load requirements across all transportation corridors;
- enhanced VGI Pilot Program, currently known as, "Power Your Drive" (workplace and multifamily) program beyond 3-year pilot;
- widespread in-home residential L2 charging;
- robust charging scaled to include an increase in DCFC and L2 public charging across SDG&E's service territory;

[11] *See* the direct testimony of Randy Schimka (Chapter 4) for further details.
[12] Proprietary IHS/Polk Data (April 2016).

- widespread vehicle-grid integration to facilitate economic charging, decarbonizing the grid and increased usage of renewable energy;
- advanced vehicle battery storage pilots to enable reliable future distributed energy resources ("DERs"); and
- GHG reductions 80% below 1990 levels by 2050.[13]

Reaching these long term goals will result in a region where TE and charging are robust and at scale; where TE is a reliable and cost-effective DER; and where clean utility investments are fully-integrated into the grid to meet new EV load.

Consistent with these long term goals and the ACR's recognition that future proposals will be necessary, SDG&E intends to pursue future programs related to buses, the medium and heavy duty commercial and industrial market and tourism to continue to advance California's EV and environmental goals and SDG&E's TE vision.[14] Additionally, SDG&E will look at opportunities in the EV secondary market, including stationary usage for old batteries and opportunities for increased transportation electrification adoption for DACs. Indeed, the tourism industry is a uniquely weighted market segment within SDG&E's service territory;[15] therefore in future filings, SDG&E will propose solutions to provide grid integrated charging infrastructure to serve this unique market segment. Each of these future filings will be designed to accent SDG&E's approved SB 350 projects and residential charging program as well as to continue to act in the ratepayers' best interests by providing increased environmental benefits, GHG reductions and supporting TE growth in a sustainable, grid-friendly manner.

[13] In accordance with EO S-3-05 (2005).
[14] SDG&E will pursue projects as technologies for these sectors become feasible for the region.
[15] 2015 San Diego Tourism Fast Facts (2016), http://connect.sandiego.org/wp-content/uploads/2016/05/2015-SDTA_FastFacts_Digital.pdf.

III. UTILITY INVOLVEMENT OFFERS UNIQUE AND IMPORTANT BENEFITS

A. SDG&E's Proposals Fill Gaps and Promote Nascent Market Development

SDG&E's six proposed priority review projects cover many areas of the nascent EV market. The proposed projects are expected to help advance TE by increasing EV adoption, enabling development of new EV-related technology advancement and providing data necessary to continue EV innovation.

Additionally, SDG&E's standard review residential charging program provides a major opportunity to expedite GHG reductions by creating convenient and safe charging in the home, while managing the new EV load in a manner that encourages dispatch of the most efficient and lowest emitting resources and reducing the potential need for new electric infrastructure. The residential market, which focuses on the light-duty vehicle segment, is the most environmentally impactful in SDG&E's service territory, and SDG&E's residential charging program encourages efficient charging and reduces range anxiety at the pace of market development – i.e., when consumers acquire EVs.

Regarding competition concerns, it should be noted that SDG&E weighed the potential benefits offered by utility participation against the potential harm arising from utility ownership of EV charging equipment within SDG&E's service territory. In particular, SDG&E considered that it is anticipated that the proposed projects and residential charging program will provide grid optimization benefits to customers, enhance consumer welfare by providing additional customer choice in electric pricing, as well as provide a choice of products and services from qualified third parties to meet the grid integrated charging needs of these proposed projects. SDG&E also considered that the scope of its proposals is limited and should comprise a relatively small market share, although they are intended to help catalyze specific market segments where

significant growth is required to make any discernible progress toward State goals. Ultimately, SDG&E concluded that, collectively, the proposed projects and residential charging program will help expand the EV market, thereby increasing opportunities for participation by third-party service providers and fostering enhanced competition and innovation. In light of these considerations and in concert with the oversight provided by the Commission, SDG&E believes its proposals are consistent with the ACR and SB 350 by seeking to minimize overall costs and maximize overall benefits and do not unfairly compete with providers in the marketplace.

B. SDG&E's Role as a Utility Provides Enablement, Balance and Safety

Utilities are in a unique position to facilitate flexible charging, ensure adequate maintenance of infrastructure and expand EV access in DACs. SDG&E has a long history of innovation and leadership implementing progressive renewable and EV energy policies. For example, in June 2015, SDG&E became the first California investor owned utility ("IOU") to meet California's 33% renewable portfolio standard ("RPS"), achieving this milestone five years ahead of the statutory requirement.[16] By 2020, SDG&E anticipates that it will source 45% of its energy from renewable resources.

SDG&E also leveraged the federal EV Project funded under the American Recovery and Reinvestment Act to study customer response to alternative EV rate designs.[17] The results confirmed that customer response to price signals can be harnessed to benefit the grid, the environment and customers' own bottom lines. Pursuant to D.16-01-045, SDG&E will

[16] *SDG&E Reaches New Milestone for Renewable Power Delivery* (August 2015), https://www.sdge.com/newsroom/press-releases/2015-08-25/sdge-reaches-new-milestone-renewable-power-delivery.

[17] *Final Evaluation for San Diego Gas & Electric's Plug-in Electric Vehicle TOU Pricing and Technology Study*, prepared by Nexant, Inc. (2014), http://www.sdge.com/sites/default/files/documents/1681437983/SDGE%20EV%20%20Pricing%20%26%20Tech%20Study.pdf?nid=10666.

implement a new rate design (reflecting hourly grid conditions and the price of energy) with the roll-out of its Power Your Drive charging station program.

In addition, with SDG&E's new EcoChoice[SM] option, customers can subscribe to receive up to 100% of energy from renewable sources.[18] Also, in 2016, SDG&E responded to the Governor's state of emergency and the Commission's concerns about potential peak energy shortages in Southern California by expediting installation of 37.5 MW/150 MWh of energy storage, one of the largest battery storage projects to date.[19]

Internally, SDG&E began implementation of a five-year plan to increase the Company's alternative fueled vehicles ("AFVs") fleet from 6% to 22% by 2020, including both EVs and compressed natural gas ("CNG") vehicles. In addition, on December 15, 2016, SDG&E announced that it had signed a memorandum of understanding with XL Hybrids to purchase up to 110 of their first-of-its-kind, plug-in electric hybrid truck systems between 2017 and 2020.[20]

SDG&E's commitment to State climate change goals and TE policy is also demonstrated by SDG&E's current "Race to 500" campaign: an innovative clean transportation program aimed at increasing employee adoption of EVs and workplace charging.[21] It is SDG&E's goal to become one of the first Southern California businesses to have 500 employees use EVs as their primary form of transportation. As of December 31, 2016, 319 employees have purchased or leased EVs. SDG&E is also sizing its own workplace charging infrastructure to facilitate existing and growing demand. These experiences have helped to inform SDG&E about the

[18] SDG&E's EcoChoice[SM], http://www.sdge.com/environment/connected-to-the-sun/ecochoice.
[19] *See* SDG&E Advice Letter 2924-E, http://regarchive.sdge.com/tm2/pdf/2924-E.pdf
[20] *SDG&E Transforming Vehicle Fleet* (December 2016), http://sempra.mediaroom.com/index.php?s=19080&item=137228.
[21] *"Race to 500" Paves Way to Meeting San Diego's Clean Energy Goals* (October 2015), http://www.sdge.com/newsroom/press-releases/2015-10-15/race-500-paves-way-meeting-san-diego%E2%80%99s-clean-energy-goals.

many different ways its customers can electrify their transportation needs and how SDG&E can align the interests of the many stakeholders to facilitate rapid deployment of charging infrastructure.

1. A Focus on DACs

DACs often face disproportionate exposure to the health and economic impacts of air pollution and climate change,[22] making increased access to electricity as a transportation fuel in DACs a policy priority.[23] The proposed priority review projects and standard review residential charging program will cover a variety of regions and market segments in order to best serve a representative set of San Diego residents. Indeed, as shown in the Chapter 3 testimony of Randy Schimka, many of the projects will be located in DACs. Regarding the standard review residential charging program, SDG&E proposes that at least 20% of residences authorized through this Application be located in DACs. SDG&E is also currently considering new proposals to reduce the cost of ownership and operation of EVs in DACs, including the development of a secondary market for access to vehicles and needed charging, and may propose such programs in a future application.

2. Ensuring Reliable Service

Commission oversight of utility TE investments is critical for ensuring that, to the extent possible, all ratepayers have access to reliable charging and share in the benefits of TE. Like the Power Your Drive program, SDG&E proposes that the programs offered in this Application include utility ownership, installation and maintenance of EV charging infrastructure. Utility ownership of EV charging infrastructure is consistent with SDG&E's guiding principles of

[22] Center for Sustainable Energy ("CSE") 2016 Quality of Life Dashboard, p. 8, https://energycenter.org/sites/default/files/2016-equinox-regional-dashboard-report.pdf.
[23] P.U. Code §§740.12(a)(1)(E) and (a)(1)(C).

providing safe, reliable and affordable utility service to all customers. SDG&E will ensure that facilities installed using ratepayer funds are reliably operated and maintained over the life of the asset, minimizing the risk that charging infrastructure will be put out of service due to inadequate maintenance and equipment failure, poor customer service or bankruptcy – experiences which drive customers away from EVs and that have plagued an industry still getting its footing.

The Commission confirmed in SDG&E's Vehicle-Grid Integration Pilot Program decision that utility ownership of grid integrated electric charging infrastructure can provide ratepayer value.[24] SDG&E proposes to leverage the experience of the competitive marketplace to procure equipment, services and skills from industry providers. This promotes innovation, efficiency and market growth while ensuring critical customer and ratepayer protections under the Commission's oversight.

3. Safety is a Priority

As with any infrastructure development proposed to the Commission, SDG&E is committed to the safety of the public and its employees. SDG&E actively manages risk by incorporating risk management principles and practices into daily operations and strives to continue including safety and security risk management as a key aspect of organizational decision-making processes. Accordingly, SDG&E is dedicated to providing safe, reliable service and equipment to support widespread growth of TE. Indeed, SDG&E requires that any utility owned charging infrastructure used in the proposed projects and residential charging program be approved by a Nationally Recognized Testing Laboratory ("NRTL").[25] SDG&E also proposes that contractors engaged in construction, maintenance and operations have Electric Vehicle

[24] D.16-01-045, p. 171, Findings of Fact 61 and 62.
[25] OSHA-approved list of NRTLs, https://www.osha.gov/dts/otpca/nrtl/.

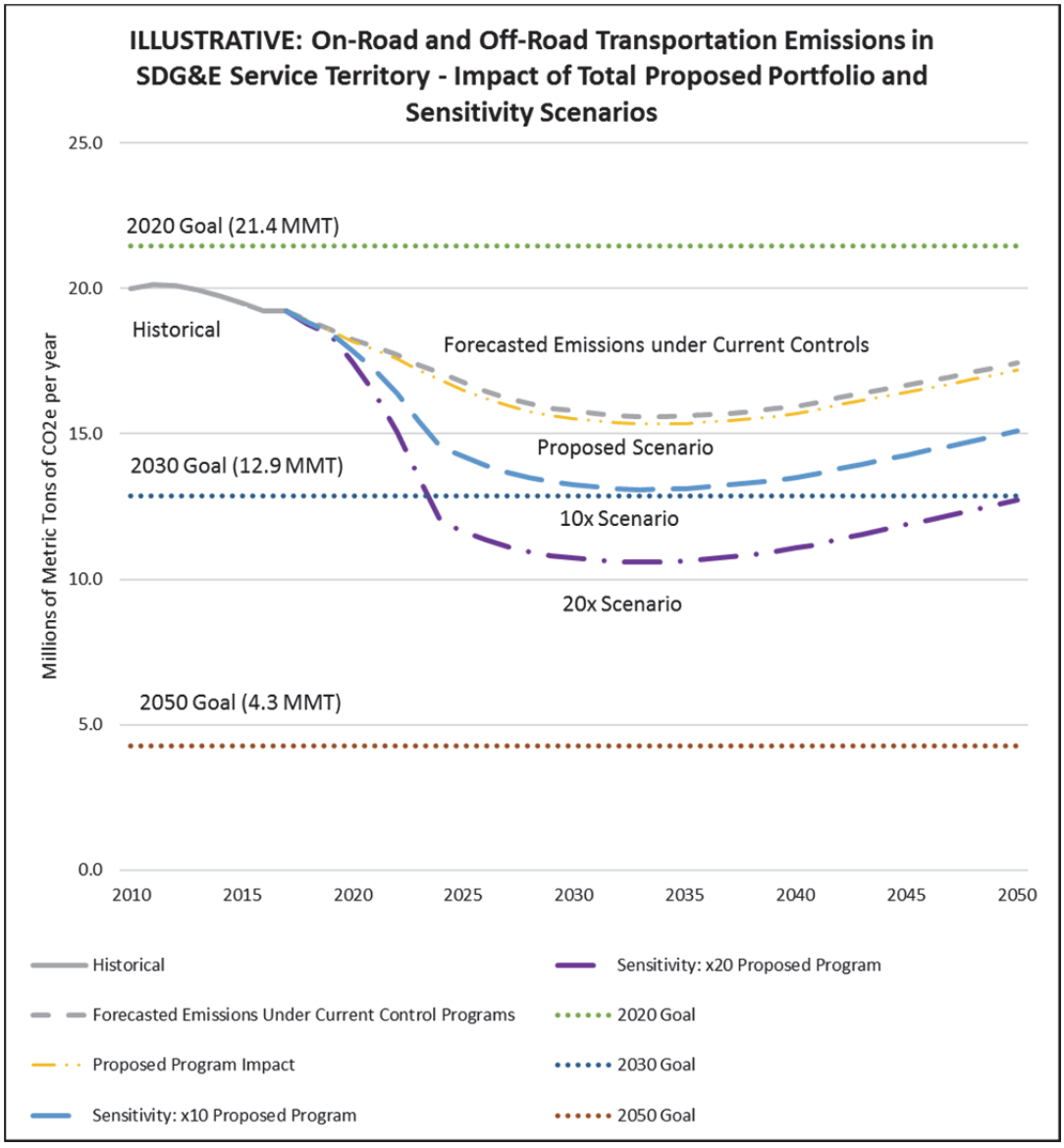
Infrastructure Training Program ("EVITP") certification, be a signatory to the IBEW with a valid C-10 contractors license, and otherwise meet the utility's rigorous safety standards.

IV. EXPEDITED APPROVAL REQUIRED TO MEET TE GOALS

We commend Commissioner Peterman's ACR in launching the most progressive and informative TE program in the nation. However, expedited approval is needed to meet the SB 350 accelerated widespread TE goals. Chart 1-2, below, overlays the GHG emissions reductions of SDG&E's proposed projects and residential charging program at the total size proposed, and then shows sensitivities at 10 times and 20 times the proposed total size.[26] At 20 times the proposals' total size, SDG&E's service territory will fall short of its on-road and off-road emissions reduction goals without additional action. The disparity between the impact of SDG&E's proposals and the GHG goals underscores the need to move quickly so that the lessons learned from the proposed projects can be scaled to larger projects.

[26] GHG emission reductions reflected in Chart 1-2 are forecasts based on how SDG&E believes the market may behave in future years.

Chart 1-2



Upon Commission approval, SDG&E will begin taking the necessary steps to implement both its priority review projects and standard review residential charging program.

This concludes my direct testimony.

V. STATEMENT OF QUALIFICATIONS

I am the Vice President, Operations Support and Sustainability and Chief Environmental Officer for SDG&E and Southern California Gas Company ("SoCalGas"). I am responsible for facilities, fleet services, environmental services and clean transportation. My business address is 8330 Century Park Court, San Diego, California, 92123. I hold a master's degree in business administration with an emphasis in finance from George Mason University and a bachelor's degree in economics from the University of Arizona. Over the last 25 years, I have held various positions with SDG&E and SoCalGas in finance, customer services and regulatory affairs. Prior to joining SDG&E, I was an energy economist at the Federal Energy Regulatory Commission Office of Electric Power Regulation. I have testified numerous times before the Commission.