UCAN DATA REQUEST
UCAN-SDG&E-DR-01
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 19, 2014

1. Throughout the testimony of J. C. Martin, he mentions meeting zero-emission vehicles policy goals. Is it true that most of the vehicles that will be added to the EV fleet will most likely be "hybrids" (dual fuel vehicles) and not literally zero emission (or all electric) vehicles?

    a. Do hybrids qualify toward meeting the State's zero emission policy goals?

SDG&E Response:

Yes, Plug-in Hybrids qualify toward meeting the State's ZEV policy goals. The 2013 ZEV Action Plan defines ZEVs to include Hydrogen fuel cell electric vehicles (FCEVs), Plug-in hybrid electric vehicles (PHEVs), and plug-in electric vehicles (PEVs).[1] SDG&E's VGI vehicle population forecast reflects that a majority of EVs will be PHEVs (i.e. hybrid vehicles where a portion of the total range is zero emission miles provided by electric grid charging of the vehicle's battery). SDG&E believes that these PHEVs provide zero emission miles (ZEM), depending on their battery capacity. The ZEM for PHEVs are reflected in Table 6-3 of J.C. Martin's Chapter 6 testimony.

[1] ZEV Action Plan: a roadmap toward 1.5 million vehicles on California roadways by 2025: http://www.opr.ca.gov/docs/Governors_Office_ZEV_Action_Plan_(02-13).pdf (page 1)

UCAN DATA REQUEST
UCAN-SDG&E-DR-01
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 19, 2014

2. In your forecast of EV adoption, how many Zero Emission Vehicles (ZEV) are assumed to be (1) battery electric, (2) fuel cell and (3) plug-in hybrid vehicles?

   a. How does each of these vehicle types count toward meeting the State's ZEV policy goals?
   b. Do the differences in these technologies influence the benefit/cost results?
   c. How did you decide how much of each type of vehicle would be purchased in your EV adoption assumption?
   d. Do these different types of ZEV have different charging profiles, i.e., energy usage profiles?
   e. Do they influence the State's achievement of ZEV policy goals if the mix of ZEV vehicles varies from what SDG&E assumed?
   f. How does that affect the overall benefit/cost results if the mix varies?

SDG&E Response:

SDG&E EV population forecast for the VGI Application is detailed in Table 6-5 of J.C. Martin's Chapter 6 testimony. The EV population forecast contains Battery Electric Vehicles (BEVs) and PHEVs, the forecast does not contain fuel cell vehicles.

a) Please see the ZEM assumptions in Table 6-5 of J.C. Martin's Chapter 6 testimony.
b) Yes
c) The EV population forecast is based on the forthcoming "California Transportation Electrification Assessment - Final Draft Phase 1 Report", Table 8, CalETC - prepared by ICF International. SDG&E's share is assumed to be 9.43%. The final version of this document is available at: http://www.caletc.com/wp-content/uploads/2014/08/CalETC_TEA_Phase_1-FINAL.pdf.
d) Yes, see the ZEM Required in Table 6-3 of J.C. Martin's Chapter 6 testimony.
e) Yes
f) The overall benefit/cost results are affected by the EV Charging Load Impacts. EV Charging Load Impacts are influenced by ZEM Requirements for each EV Type. Please see Section B, Cost Optimization Approach to Estimate EV Charging Load Impacts in J.C. Martin's Chapter 6 testimony for a detailed description of how the EV Charging Load Impacts are estimated.

UCAN DATA REQUEST
UCAN-SDG&E-DR-01
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 19, 2014

3. What fraction of electric vehicles induced by the development of these utility-owned charging stations does the utility expect will actually be zero emission vehicles?

SDG&E Response:

SDG&E estimates that 100% of the EV additions (i.e., EVs purchased due to a Workplace and MuD settings through the VGI Pilot Program described in the Application) are zero emission vehicles that meet the ZEV Action Plan requirements.

UCAN DATA REQUEST
UCAN-SDG&E-DR-01
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 19, 2014

4. What are the range and speed of zero emission vehicles compared to the range and speed of hybrid electric vehicles?

SDG&E Response:

SDG&E's VGI Cost Effectiveness analysis does not consider the range and speed of zero emission vehicles compared to the range and speed of hybrid electric vehicles. The assumptions made about the mix of EVs, their battery capacities and miles driven is described in Mr. Martin's testimony.

UCAN DATA REQUEST
UCAN-SDG&E-DR-01
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 19, 2014

5. What is the State policy goal for Low Emission Vehicles (LEV) versus ZEV over the near to long term?

J. C. Martin states: "SDG&E assumed four incremental EV purchases due to each MuD VGI Pilot Program installation and eight incremental EV purchases due to each workplace VGI installation."(J. C. Martin VGI Testimony, JCM-17) "EV adoption due to the presence of workplace and MuD charging is a hypothesis to be tested by SDG&E's VGI Pilot Program." (J. C. Martin VGI Testimony, JCM-17, FN 11)

Given that the assumption being used to determine cost effectiveness will be verified in the VGI study after the fact, it suggests that the cost effectiveness results are speculative based on an assumption rather than a range of assumptions regarding the number of EV purchases per MuD and workplace VGI installation.

SDG&E Response:

SDG&E is aware that current ARB LEV regulations place requirements on criteria pollutants and GHG emissions for motor vehicles in California. The regulations allow vehicle manufacturers in compliance with US EPA GHG emission to comply with California GHG emission requirements for model years 2017 to 2025.[2] The CA ZEV policy is articulated by Governor Brown's Executive Order B-16-2012 which sets a goal for ZEV infrastructure adequate to support one million vehicles by 2020, among other goals.

[2] See ARB LEV III: http://www.arb.ca.gov/regact/2012/leviiidtc12/leviiidtc12.htm

UCAN DATA REQUEST
UCAN-SDG&E-DR-01
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 19, 2014

6. Please provide the cost effectiveness results assuming EV purchases are reduced as follows:

   a. (1) **TWO** incremental EV purchases due to each MuD VGI Pilot Program installation and **FOUR** incremental EV purchases due to each workplace VGI installation and
   b. **ONE** incremental EV purchases due to each MuD VGI Pilot Program installation and **TWO** incremental EV purchases due to each workplace VGI installation.

   (NOTE: This reduces the SDG&E assumption in (1) by 50 percent and in (2) by 75 percent with the goal of determining how sensitive the positive cost effectiveness results are to the EV adoption assumptions).

SDG&E Response:

SDG&E will provide these sensitivity results based on the schedule agreed to by UCAN and SDG&E.

UCAN DATA REQUEST
UCAN-SDG&E-DR-01
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 19, 2014

7. In this VGI example, the RIM test reveals a large level of revenues from these charging stations from participants that overshadows the capital costs and electric supply costs that must be paid by all other non-participating ratepayers. Under the revised assumptions in question 6 (a) and (b) above about EV adoption, if the RIM test fails, what is SDG&E's position on pursuing this project?

SDG&E Response:

The RIM test is one of several cost-benefit tests including the Total Resource Cost test (TRC), the Societal Cost Test (SCT), the Participant Cost Test (PCT). These four cost effectiveness tests are not pass/fail tests; they provide policy makers insight into the overall impacts of a project or program, as proposed as well as when implemented. Assumption revisions would need to be evaluated for reasonableness, before an alternative position could or would be considered by SDG&E. These tests are useful for evaluating and adjusting program alternatives over time to improve the benefits realized from programs, in light of the costs.

UCAN DATA REQUEST
UCAN-SDG&E-DR-01
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 19, 2014

8. Using the four tests, i.e., the RIM, PCT, TRC, and SCT, how does SDG&E decide whether to pursue a program when one or more tests fail?

   a. Which tests are the most critical?
   b. How would SDG&E propose revising the VGI program if one or more of the tests failed especially the RIM or PCT test?

SDG&E Response:

The four cost-benefit tests are not pass/fail tests.

a) Each cost-benefit test answers a key policy question. Policy makers may consider one more critical than another.
b) The four cost-benefit tests are not pass/fail.

As explained in Mr. Martin's testimony, the cost effectiveness tests used in the VGI Pilot Program proposal are adapted from the CPUC's Standard Practice Manual for cost effectiveness testing[3] as typically applied to energy efficiency and demand response programs. These methodologies were applied to this pilot application for illustrative purposes. Since no data exists today for modeling a VGI like proposal, assumption sets were described in order to hypothesize outcomes.

[3] *See* "California Standard Practice Manual," http://www.cpuc.ca.gov/NR/rdonlyres/004ABF9D-027C-4BE1-9AE1-CE56ADF8DADC/0/CPUC_STANDARD_PRACTICE_MANUAL.pdf (2001).

UCAN DATA REQUEST
UCAN-SDG&E-DR-01
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 19, 2014

9. In Table 6-12 of J. C. Martin's testimony (JCM-34), the Rate Impact Measure (RIM) and the Participants Test (PCT) show the offsetting values: increased revenues for the utility under the RIM test and equally higher utility bills under the PCT. There are no other Benefits identified in the RIM test. This means that the Participants are responsible for all the benefits of the program which exceed the increase electric supply costs and cost of the charging stations paid for by all customers, including both participants and non-participants.

    a. Is this result entirely dependent upon the EV adoption assumption by SDG&E?
    b. Are there any other costs or benefits assumptions that are driving the RIM and PCT results?

SDG&E Response:

Chapter 6 was revised July 29, 2014. Table 6-12 in the July revision does not have equal offsetting values; increased revenues for the utility under the RIM test are higher than the utility bills under the PCT.

a) Yes, without EVs SDG&E's VGI Application would have no value. The benefits realized require the presence of managed EV charging loads and usage.
b) Please see SDG&E's Chapter 6 for a description of major assumptions associated with the RIM and PCT results.

UCAN DATA REQUEST
UCAN-SDG&E-DR-01
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 19, 2014

10. Using the same 1:2 ratio of MuD to Workplace VGI installations, please calculate the breakeven point where the NPV for each of the four tests equals zero, i.e., where benefit/cost =1.

SDG&E Response:

SDG&E will provide these sensitivity results based on the schedule agreed to by UCAN and SDG&E.

UCAN DATA REQUEST
UCAN-SDG&E-DR-01
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 19, 2014

11. Has SDG&E surveyed the public sector, e.g. the City and County of San Diego and the State of California to determine their long-term plans for building electric vehicle charging stations over the next 10-20 years?

    a. If yes, please explain findings
    b. If no, please explain why not

Has SDG&E obtained any forecasts of the private sector's expected development of EV charging stations over the near term and long term

    a. If so, please quantify what you learned from those long-term capital investment plans and indicate how you factored those plans into your needs assessment for additional charging stations in San Diego?
    b. If not, please explain why not.

SDG&E Response:

SDG&E has worked closely with the City of San Diego and the County of San Diego on their plans for installing electric vehicle charging stations. Both entities have recently been the recipients of $500,000 grants from the California Energy Commission to install electric vehicle charging stations and charging infrastructure. Both entities are in the process of installing their first charging stations under their respective grants on a relatively small scale, and are entering into relationships with owner/operators to provide the charging equipment and services. To SDG&E's knowledge, neither entity has a formal long-term plan for installing charging infrastructure at this time.

SDG&E is not aware of any forecasts of the private sector's expected development of EV charging stations over the near term and long term. Since 2009 SDG&E has worked with stakeholders that have commenced exploring different aspects of this work, but during these formative years of market development, formal projections have not yet appeared. SDG&E is working with SANDAG in their long term regional transportation planning, but to our knowledge such a plan will not include such forecasts.

UCAN DATA REQUEST
UCAN-SDG&E-DR-01
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 19, 2014

12. How did SDG&E determine the number of charging stations to build?

SDG&E Response:

For the VGI pilot project, SDG&E's goal was to propose enough VGI facilities and corresponding charging station installations to gather meaningful results from data gathered to represent a number of system characteristics. Since one component of the VGI rate is tied to circuit-specific conditions, with about 1,100 circuits in SDG&E's system, the volume proposed increases the likelihood that there will be adequate representation of enough circuits to derive meaningful distribution system level results. For example, SDG&E would like to gather data on several different VGI operating scenarios, including but not limited to workplace and MuD sites, different classifications of distribution circuits (such as, residential loads, commercial loads, climate zone, age, different load diversities), different circuit operating characteristics (such as, overhead, underground), and various customer and EV driver demographic representations. SDG&E believes it is important to have enough installations as part of the VGI pilot to be able to capture and study with some credible level of statistical significance. There is no guarantee that this will be achieved, but the greater the volume of facilities, the greater the likelihood that the pilot will yield robust results sufficient to inform policy.

Also, the number of charging stations proposed represents a volume of work, over a reasonable period of time (5 years) necessary to realize some scale economies, which should attract a number of third parties competing to bid on the work enabling implementation of the VGI pilot at a competitive cost.

Finally, SDG&E is obligated do its part in achieving the Governor's goal in providing adequate infrastructure to support up to 1 million ZEVs by 2020. "Adequate infrastructure" is part customer perception, and part effective deployment of EVSE to ensure that all customer segments have EVSE availability: residential, long parking duration non-residential, short parking duration non-residential. The VGI Pilot address two customer segments that have a low availability of EVSE: MuD residents and workplace settings. As described in the answer to question 22, half of SDG&E's residential customer population, that is those that live in MuDs, have little or no access to convenient home charging. Also, as noted in the response to question 22, the growth in charging facilities in non-residential long-duration workplace parking has been weak, and lagging behind non-residential short-duration public charging facilities. The VGI pilot aims to address these deficiencies in the SDG&E service area. Currently, there is one installed non-residential or commercial (non-home) charging station for every 15 vehicles in the SDG&E territory, the majority of which are only in public short-duration parking locations and not in the long-duration parking locations. To meet the Governor's 2020 infrastructure goal, SDG&E and others industry experts believe that much more EVSE deployment is needed.[4] SDG&E's VGI Pilot offers a reasonable level of EVSE deployment to effectively address deficits in EVSE availability for two critical customer segments, as its contribution to meeting the Governor's infrastructure goals.

[4] *See, e.g.*, http://www.mercurynews.com/business/ci_24947237/charge-rage-too-many-electric-cars-not-enough-workplace-chargers; *Mercury News* article "Charge Rage" by Dana Hull, January 19, 2014.

UCAN DATA REQUEST
UCAN-SDG&E-DR-01
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 19, 2014

13. Has SDG&E considered a joint public-private partnership with the public sector in developing the electric vehicle infrastructure that does not place the entire capital cost burden on SDG&E ratepayers?

SDG&E Response:

SDG&E did consider various public funding options while preparing the VGI application.

In the past, SDG&E has worked with the various Electric Vehicle Service Providers installing charging stations, most of them having some sort of grant or government funding to support installation. Because the property owners or site managers had to contribute valuable parking spaces to the effort, which are usually marked for EV parking only, most of them were reluctant to share any costs to move projects forward. Many property owners value their parking spaces as a function of revenue that flows into their property, and SDG&E has heard numbers as high as $30,000 per space quoted as the all-in cost of parking at a typical shopping center.

Because the grant or government funding was usually not large enough to pay entirely for the installation, this cost share question (i.e., developers with property owners/site managers) arose in almost every job. SDG&E's experience is that the concept of cost share eliminated approximately 80-85% of the potential host sites customers when it came to installing stations with grant or government funding.

Because of this, SDG&E believes that in order for host customers to successfully accept VGI facilities , the offering to property owners at a no-cost basis is necessary in order for serious consideration of such installations.

This approach ensures that the VGI facilities received maximum utilization in order to deliver benefits to all SDG&E customers.

UCAN DATA REQUEST
UCAN-SDG&E-DR-01
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 19, 2014

14. Do IOUs, the public sector or private companies have a competitive advantage in building, owing and operating EV charging stations in terms of costs, tax advantages or locational advantages over any of the other two charging station ownership options

SDG&E Response:

This is unknown at this time, in light of the formative state of the market, and the limited business models currently addressing EV service needs. SDG&E's proposal offers an opportunity to explore additional business model alternatives for further evaluation. The utility is in a unique position to create an innovative rate tied to the variable cost of energy, as well as system and grid conditions, with enabling technology to provide benefits to all customers. By implementing this pilot through third parties in the manner proposed, it's likely that this approach can take advantage of and increase the value of current EV service business models and assets to work in concert to deliver grid-integrated charging benefits. It's too early in this market to constrain innovation and limit market participation – instead, now is the time to explore, innovate and collaborate to accelerate this market transformation. SDG&E's proposal offers this opportunity.

UCAN DATA REQUEST
UCAN-SDG&E-DR-01
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 19, 2014

15. Does combining the ownership option, i.e., SDG&E versus non-utility charging station owners, with the pricing pilot, unnecessarily complicate the cost effectiveness results?

SDG&E Response:

Yes, combining ownership options results in a "fragmented actors" use-case described in the Energy Division Staff White Paper, Vehicle-Grid Integration: A Vision for Zero-Emission Transportation Interconnected throughout California's Electricity System. A fragmented actor use-case, results in difficulty attributing benefits to actors. A "fragmented actors" scenario also results in increased pilot coordination complexity thus increased pilot costs and cost-benefit estimation uncertainty. In addition, it is not clear how a third party could be compelled to implement pricing to the charging customer that would test VGI concepts.

UCAN DATA REQUEST
UCAN-SDG&E-DR-01
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 19, 2014

16. Is the VGI pilot rate only available to EV owners who use SDG&E charging stations whereas commercial charging station owners purchase power under AL-TOU?

SDG&E Response:

Yes, the SDG&E VGI rate is for electric vehicle customers (including commercial fleet) who sign up for the SDG&E VGI rate to use at VGI facilities, which are proposed as a separate metered service, and not a facility connect load to a commercial customer's service panel (and meter). Non-residential customers can use their existing rate for their electric vehicle charging load, in the event that the load associated with EV charging is part of the customer's regular metered load. Available rates for separately metered commercial charging stations include Schedules A, TOU-A and AL-TOU.

UCAN DATA REQUEST
UCAN-SDG&E-DR-01
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 19, 2014

17. Please explain the differences between SDG&E's proposed VGI rates for Electric Vehicles and the AL-TOU rate that commercial EV charging station owners pay.

SDG&E Response:

As described in Ms. Fang's testimony, SDG&E's proposed VGI rate for electric vehicles incorporates an hourly base rate, a dynamic hourly commodity component, and a dynamic hourly distribution component. The commodity component is similar to the existing Critical Peak Pricing rate, with a price signal adder during the system peak hours, and with the addition of the CAISO day-ahead hourly price. The distribution component of the VGI rate is also similar to the existing Critical Peak Pricing option, but includes a price signal adder during the circuit peak hours rather than the system peak hours.

SDG&E's AL-TOU rate schedule includes TOU energy charges, a basic service fee, and peak and non-coincident demand charges. Commodity costs are recovered through energy charges based on TOU period, and system peak demand charges. Distribution costs are recovered through system peak and non-coincident peak demand charges, and a demand-based basic service fee. This schedule is available for customers with demand greater than 20kW.

UCAN DATA REQUEST
UCAN-SDG&E-DR-01
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 19, 2014

18. Is it possible to separate or isolate the pricing pilot results from the ownership of the EV charging station?

SDG&E Response:

SDG&E's cost-benefit results are estimated based on SDG&E ownership of the entire VGI facility, which includes the EVSE. The VGI facility is proposed as a holistic facility solution and when combined with the VGI rate has the strongest likelihood of achieving the VGI benefits to all customers. For example, if the EVSE was parsed out to another entity and owned separately, with that ownership the operations and maintenance responsibilities and costs follow. If the EVSE fails to perform then all the other VGI assets put in place "upstream" of the EVSE will not be fully utilized and the benefits not achieved as proposed. Since total VGI facility performance is critical, the EVSE ownership aspect of the VGI facility should be subject to the conditions of the operation and maintenance agreements contemplated as part of the performance contract with third parties to implement the VGI requirements. Since EVSE in integral to the VGI facility SDG&E expects to entertain a variety of operational and maintenance solutions, some of which may introduce EVSE ownership alternatives to improve the overall performance of the VGI facility.

UCAN DATA REQUEST
UCAN-SDG&E-DR-01
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 19, 2014

19. What other rate options might be available to other non-utility owners of electric vehicle charging stations other than AL-TOU?

SDG&E Response:

SDG&E currently offers two Electric Vehicle Time-Of-Use rate options, schedules EV-TOU and EV-TOU-2, for residential customers. Non-residential customers can use their existing rate for their electric vehicle charging load, in the event that the load associated with EV charging is part of the customer's regular load. For separately metered commercial charging stations, schedules such as A, TOU-A and Schedule AL-TOU are also available.

UCAN DATA REQUEST
UCAN-SDG&E-DR-01
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 19, 2014

20. Does SDG&E view itself as competitors to these non-utility charging station owners in the private sector?

    a. If so, why?
    b. If not, why not?

SDG&E Response:

No, SDG&E does not view itself as competitors to non-utility charging station owners in the private sector. As noted in the answer to question 14 by implementing this pilot through third parties in the manner proposed, it's likely that this approach can take advantage of and increase the value of current EV service business models and assets to work in concert to deliver grid-integrated charging benefits. The volume of work and the 5 year time line creates market certainty for providing EV services to SDG&E customers through third parties.

UCAN DATA REQUEST
UCAN-SDG&E-DR-01
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 19, 2014

21. What research has SDG&E done about the state of the private Electric Vehicle Charging market in San Diego? I.e. growth rates, number of stations being developed yearly, amount of funding committed to installation of EV stations, building permits issued?

SDG&E Response:

SDG&E tracks commercial electric vehicle charging stations installations in the region.

The EV Project received over $100 million in funding from the DOE to install large numbers of charging stations in various markets around the country. There was large upswing in the number of stations installed when the EV Project was underway. Installations of EVSE have fallen off since the EV Project ended. There is also concern as to whether and how these installed EVSE will be maintained and replaced over time.

SDG&E tracked the installation of approximately 120 commercial charging stations from 2011 through the end of 2012, up to approximately 600 stations by the end of 2013 (when ECOtality went bankrupt and the EV Project was stopped).

As of August 1, 2014, nine months later, SDG&E has tracked a total of approximately 670 commercial charging stations at 194 locations in the region, which is quite a drop-off from the previous trajectory when DOE funding was feeding the pipeline of installations.

UCAN DATA REQUEST
UCAN-SDG&E-DR-01
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 19, 2014

22. Has SDG&E conducted any research to suggest stagnant growth in San Diego's EV charging market? If so, please provide that research.

SDG&E Response:

Workplace Charging:

SDG&E has approximately 942 customers with loads over 20kW in the service territory that are workplace-oriented.

For the purpose of EV charging, SDG&E classifies a "workplace" location as primarily non-residential locations where cars are parked and charged for long durations. These locations can typically be traditional office buildings, commercial sites, colleges, or hospitals.

SDG&E tracks public charging station installations in the region, and currently has identified approximately 50 sites as "workplace". Because these 50 installed charging sites represent only 5.3% of the total workplace customer sites in the region, SDG&E believes that workplace electric vehicle charging is underserved.

Multi-Unit Dwelling Charging:

SDG&E hosts quarterly workshops in the area to inform customers about electric vehicles and charging technology. Many customers and property managers/owners have attended these workshops, and asked for more information about charging electric vehicles. Because of these workshops and inquiries, SDG&E has been active in making presentations at various groups related to MuD sites such as local trade associations, property management associations, and apartment associations. Due to these relationships, including those with related trade associations and allies (such as, the California Association of Community Managers, and the California Apartment Association), SDG&E has been able to determine that there are approximately 15,500 MuD properties in San Diego, comprised of 2,200 small MuDs, 2,600 Medium to Large MuDs greater than 25 units, and 10,700 Rentals.

While more difficult to track than the workplace sites, SDG&E tracks MuD charging installations through the contacts described above, plus direct inquiries, websites, and news stories. We currently believe that there are approximately 14 MuD charging site installations in the region.

UCAN DATA REQUEST
UCAN-SDG&E-DR-01
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 19, 2014

Response to Question 22 (Continued)

Because these 14 installed charging sites represent only 0.09% of the total MuD customer sites in the region, SDG&E believes that MuD electric vehicle charging is even more underserved than in the workplace setting.

UCAN DATA REQUEST
UCAN-SDG&E-DR-01
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 19, 2014

23. What is the growth rate of the EV charging market in San Diego County projected to be in the next 5, 10 and 20 years for Multi-family dwelling units? For employment based chargers?

SDG&E Response:

To the best of our knowledge, a projection of the growth rate of EVSE by independent third parties does not exist. SDG&E offers up one perspective below in the answer to question 24, based on current EVSE installation trends in the region.

UCAN DATA REQUEST
UCAN-SDG&E-DR-01
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 19, 2014

24. Does SDG&E have evidence that there is Market failure for the private EV charging market in San Diego?

    a. If so, how does SDG&E define "Market Failure"?
    b. If so, please detail the evidence leading SDG&E to that conclusion.

SDG&E Response:

SDG&E believes that determining if the "market" is failing should be measured in terms of whether California is on an infrastructure deployment and PEV adoption trajectory sufficient to reach the Governor's goal for California. Given the current trajectory of infrastructure deployment (specifically, charging facilities), and PEV adoption in California, the Governor's goal will not be met. From this perspective, the "market" could be defined as failing.

Figure 1 (below) represents a straight line trajectory of adoption required to achieve a population of 1.5 million plug-in electric vehicles (PEVs) statewide by 2025. In addition, the graph shows the trajectory of current vehicle sales statewide[5] straight-line extrapolated out to 2025. Given this depiction, at the current level of sales, the State will see only about one-third of the Governor's goal of PEVs by 2025, which translates to a shortfall of approximately 940,000 vehicles.

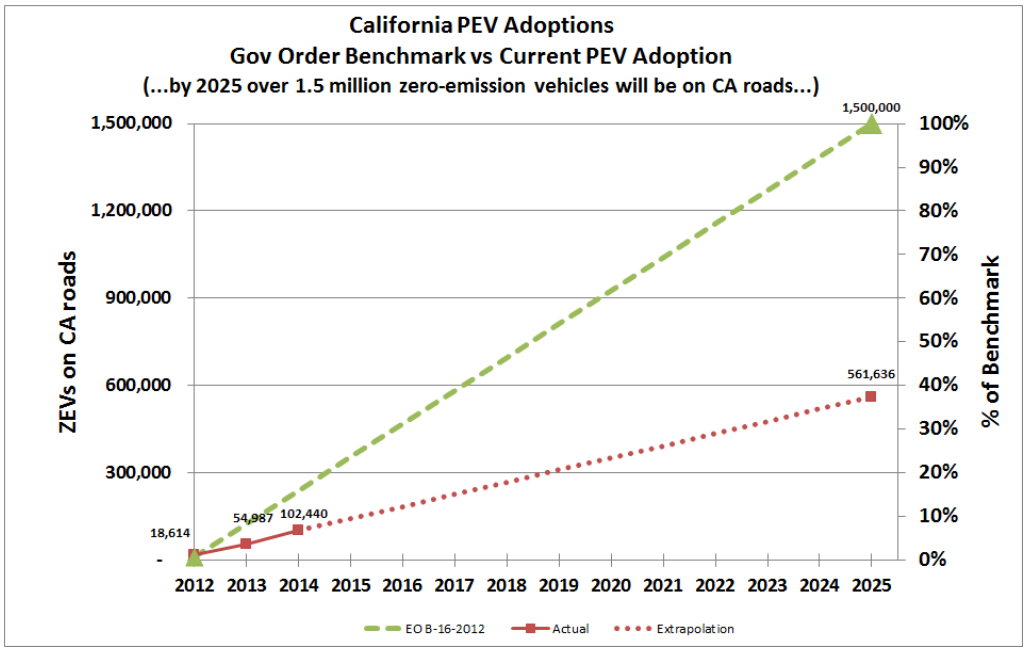

Figure 1 - Estimate of California PEV sales by 2025

[5]Source: Electric Power Research Institute, California EV registrations cumulative through Q2 2014, Aggregated data from IHS Polk.

Response to Question 24 (Continued)

Figure 2 (below) represents the same PEV sales estimated projection, but tailored specifically for SDG&E service territory. This estimate shows the San Diego region will be about 90,000 vehicles short of the San Diego's portion of the Governor's 2025 goal (SDG&E's share of PEV adoptions is depicted as 9.43% of the California total[6]).

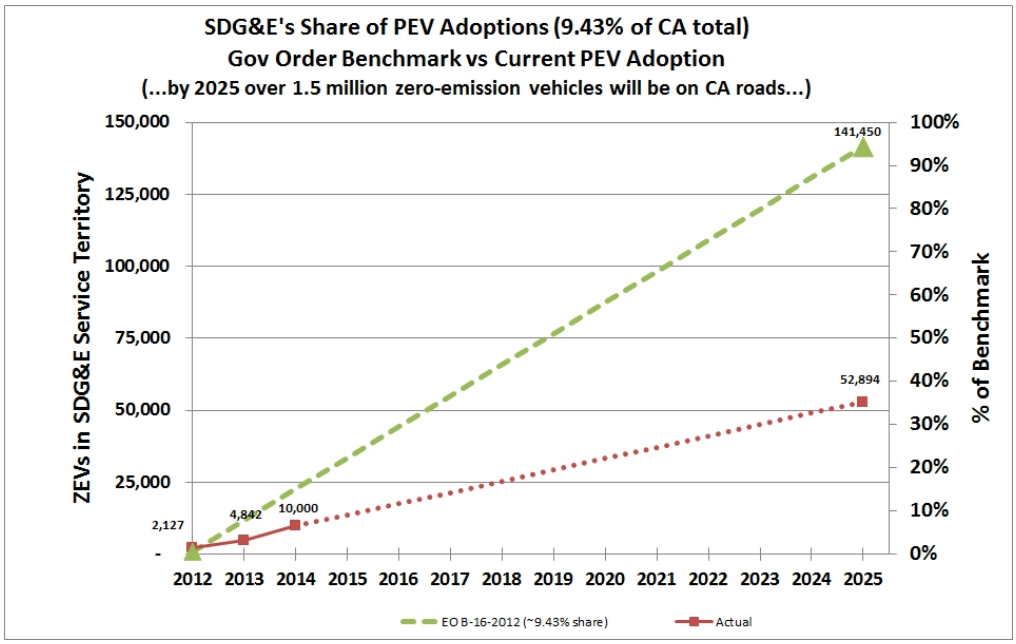

Figure 2
Estimate of San Diego PEV sales by 2025

As described in the answer to question 12, the market has failed to provide EVSE to all customer segments. As such, the VGI Pilot addresses two customer segments that have a low availability of EVSE: MuD residents and workplace settings. As described in the answer to question 22, half of SDG&E's residential customer population, that is those that live in MuDs, have little or no access to convenient home charging. Also, the growth in charging facilities in non-residential long-duration workplace parking has been weak, and lagging behind non-residential short-duration public charging facilities. The VGI pilot effectively addresses these deficiencies in the SDG&E service area. SDG&E's VGI Pilot offers a reasonable level of EVSE deployment to effectively address deficits in EVSE availability for two critical customer segments, as its contribution to meeting the Governor's infrastructure goals.

[6]Share of CA PEV adoptions estimated by ICF International, California Transportation Electrification Assessment – Phase 1: Final Report (2014).

Response to Question 24 (Continued)

For a more general discussion of market failure and underserved markets, please see SDG&E's opening comments in the AFV OIR scoping memo filed on August 29, 2014.[7]

[7] Response of San Diego Gas & Electric Company to the Order Instituting Rulemaking Assigned Commissioner's Scoping Memo and Ruling of July 16, 2014 to Consider Alternative-Fueled Vehicle Programs, Tariffs and Policies, pp. 6-11.

UCAN DATA REQUEST
UCAN-SDG&E-DR-01
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 19, 2014

25. Has SDG&E conducted any research or reviewed any studies to indicate that the EV market in San Diego is not developing due to lack of Charging Stations?

SDG&E Response:

SDG&E interacts with many of our customers at public outreach events, EV charging workshops, and during the course of answering questions about EV rates. One consistent message we have heard from our customers that live in Multi-Unit Dwellings is that they are interested in purchasing or getting more information about electric vehicles but can't easily get a charging station installed at their property. This prevents most of them from moving forward and purchasing an EV. Residents of single family homes don't have these issues since they can usually easily install a charging station in their garage.

The Center for Sustainable Energy has conducted several surveys of Electric Vehicle drivers over the past several years, in conjunction of their management of the State's Clean Vehicle Rebate program. The results from their "EV Consumer Survey Dashboard" are available on their website at the link below.

CSE website survey link:
http://energycenter.org/clean-vehicle-rebate-project/survey-dashboard

San Diego residents are split about 50 / 50 between single family homes and Multi Unit Dwellings. The results of the CSE survey show that in San Diego, 85% of their survey respondents who have purchased electric vehicles live in detached houses, 7% in apartments/condos, 7% in townhouses, and 1% in other living situations.

Some of this disparity is due to demographics and income, but SDG&E believes that the EV market is not developing as quickly in multi-unit dwellings vs. single family homes because of a lack of charging station facilities in the multi-unit communities.

UCAN DATA REQUEST
UCAN-SDG&E-DR-01
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 19, 2014

26. Has SDG&E conducted any research, reviewed any findings or studies that suggest a customer's decision to purchase or not to purchase an EV in San Diego was influenced by lack of access to charging stations in the county?

SDG&E Response:

SDG&E identifies below studies that illuminate the question posed by UCAN, and support SDG&E's contention that access to PEV charging is critical to PEV purchases and leases, just as access to petroleum fuel is critical to internal combustion engine (ICE) vehicle purchases.

One study reviewed Overcoming Barriers to Electric-Vehicle Deployment - Interim Report by the National Research Council of the National Academies (2013), concludes "Workplace charging provides a substantial opportunity to encourage the adoption of PEVs and increase the fraction of miles that are fueled by electricity," and "One substantial barrier to residential charging is the need to provide charging infrastructure for residences that have access only to street parking or shared parking lots where installation of such infrastructure is beyond the control of drivers."[8]

A SANDAG study reviewed San Diego Regional Plug-In Electric Vehicle (PEV) Readiness Plan (2014), states that "Multi-unit dwellings, or MUDs, continue to present barriers to PEV drivers.", "With roughly 80% of PEV charging taking place at home, reducing the barriers to installing EVSE at MUDs will be critical for supporting future PEV adoption.", and "Because the workplace is where they spend most of their time outside of the home, expanding workplace charging opportunities will allow commuters more flexibility and maximize electric vehicle miles traveled." [9]

A study referenced in Chapter 6 and recently completed, The California Transportation Electrification Assessment, Phase 1: Final Report (2014) states that…
"Multi-dwelling units (MDUs) or multi-family units are a commonly identified gap in the PEV market today because little progress has been made in deploying charging facilities at these locations. The degree to which this barrier will have an impact on PEV adoption is more obvious in areas with high population density and high levels of MDUs (e.g., Los Angeles, San Diego, and San Francisco), where there is a strong argument to be made that lack of charging infrastructure will negatively impact long-term PEV adoption."

[8] http://gabrielse.physics.harvard.edu/gabrielse/papers/2013/OvercomingBarriersToElectricVehicleDeployment.pdf (p. 36)

[9] http://energycenter.org/sites/default/files/docs/nav/programs/pev-planning/san-diego/San_Diego_PEV_Readiness_Planning_Guide-2013_low-resolution.pdf (pp. 18, 26, & 28)

Response to Question 26 (Continued)

The report continues to state that…

> … workplace charging provides an opportunity to extend significantly the eVMT of many PEVs. PHEVs, such as the Toyota Prius Plug-in or the Ford C-Max Energi, carry a battery that may not have the capacity to cover the driver's daily VMT. Those drivers may have to rely on gasoline to complete their daily driving unless workplace charging is available.

These studies indicate that MuD and Workplace EV charging will help overcome barriers to PEV adoption in the Nation, California, and the San Diego region.

UCAN DATA REQUEST
UCAN-SDG&E-DR-01
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 19, 2014

27. What is the average distance EV owners have to travel to charge their vehicles in San Diego County?

SDG&E Response:

The average distance EV owners have to travel to charge their vehicles is not known or tracked by SDG&E.

However, from the EV Project quarterly report (link below), we know that the average San Diego participant used about 8.1 kWh of energy for fueling their EV every day. Since the average electric vehicle can travel approximately 3 miles per kWh consumed, we know that the average EV driver travels about 24 miles per day.

EV Project 2013 Q2 report link:
http://www.theevproject.com/cms-assets/documents/127233-901153.q2-2013-rpt.pdf

UCAN DATA REQUEST
UCAN-SDG&E-DR-01
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 19, 2014

28. How much does it presently cost, in the San Diego market, for an EV

SDG&E Response:

There are a wide variety of new and used EVs for sale in the San Diego Market. SDG&E isn't involved in the business of selling cars, but can refer you to these two websites that have a lot of information about available vehicles, their features, and their costs.

New Cars:
http://www.goelectricdrive.org/electric-cars/virtual-showroom

User Cars:
http://www.autotrader.com/find/cars-for-sale-San+Diego-92123.jsp

UCAN DATA REQUEST
UCAN-SDG&E-DR-01
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 19, 2014

29. How much does it presently cost, in the San Diego market, for an EV owner to charge their vehicle per hour using a commercial EV charger?

SDG&E Response:

Three networks are responsible for the bulk of the commercial charging stations in the San Diego region.

For the Blink Network, please see their map with pricing details at:
http://prod.blinknetwork.com/blinkMap.html

For the NRG eVgo Freedom Stations, please see their web page with pricing details at:
http://www.nrgevgo.com/san-diego-county/

For the ChargePoint network stations, please see their map with pricing details at:
https://na.chargepoint.com/charge_point

UCAN DATA REQUEST
UCAN-SDG&E-DR-01
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 19, 2014

30. Does the median income of the community factor into SDG&E's analysis on how many electric vehicles owners would use the SDG&E's EV charging stations should they be installed, i.e. La Jolla as compared with National City or Escondido?

SDG&E Response:

No, the median income of the community was not used by SDG&E to determine how many electric vehicle owners would use the VGI charging stations proposed by SDG&E.

As outlined in Mr. Randy Schimka's Chapter 2 VGI testimony on page RS-7, there are several site selection criteria listed that will be used to choose VGI site installation locations.

UCAN DATA REQUEST
UCAN-SDG&E-DR-01
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 19, 2014

31. Has SDG&E determined how many new EV purchases will be made in low income communities if EV charging stations are installed?

SDG&E Response:

SDG&E has not made such a determination. One of the benefits of the VGI Pilot Program is to remove one critical barrier to the adoption of PEVs in the market: the availability and access to charging facilities. With this addressed, it is SDG&E's understanding that automotive industry and dealerships specifically are doing many things to increase the sales and leases of EVs, and the market appreciates their sharp focus on making EVs more affordable with very attractive lease rates, low down payments, attractive financing, dealership discounts, ride and drive events, and target marketing. Also, commencing in 2014, many of the PEVs leased in 2011 will be rolling off their three year leases; this promises to open up a lower cost used PEV market to those customers who would otherwise not find new PEVs affordable.

UCAN DATA REQUEST
UCAN-SDG&E-DR-01
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 19, 2014

32. Has SDG&E committed to installing EV charging stations in low income communities?

    a. If so, what percentage of the total has SDG&E committed to?

SDG&E Response:

By specifically targeting multi-family communities and residences, the VGI Pilot Program effectively commits to serve low-income customers. Multi-family communities and residents represent about 50% of SDG&E's residential customers. Sources estimate that 37% to 46% of multi-family households are low income in San Diego.[10] VGI facilities will give these customers access to EV charging facilities that to date, are not widely available at multi-family residences or their places of work. The extent to which lower income customers live in these multi-family communities, the VGI facilities will give them the opportunity to access EV charging through SDG&E's VGI Pilot Program. Similarly, installing the VGI facilities at a customer's place of work will create an opportunity to access EV charging. SDG&E's application does not commit to serve a specific percentage of low income customers.

[10] 37.9% from ESA data using 2011 American Community Survey - Public Use Microdata Sample (PUMS), ESA Multi-family = buildings having five or more units, derived from Table 9, p. 28.
41.0% from Nielsen 2011 data file.
45.7% from SANDAG using 2012 American Community Survey PUMS.
Note: Low income = family income below 200% of the federal poverty threshold