VGIC Responses to CPUC Comments on VGI WG Workshop #5 Policy Recommendations

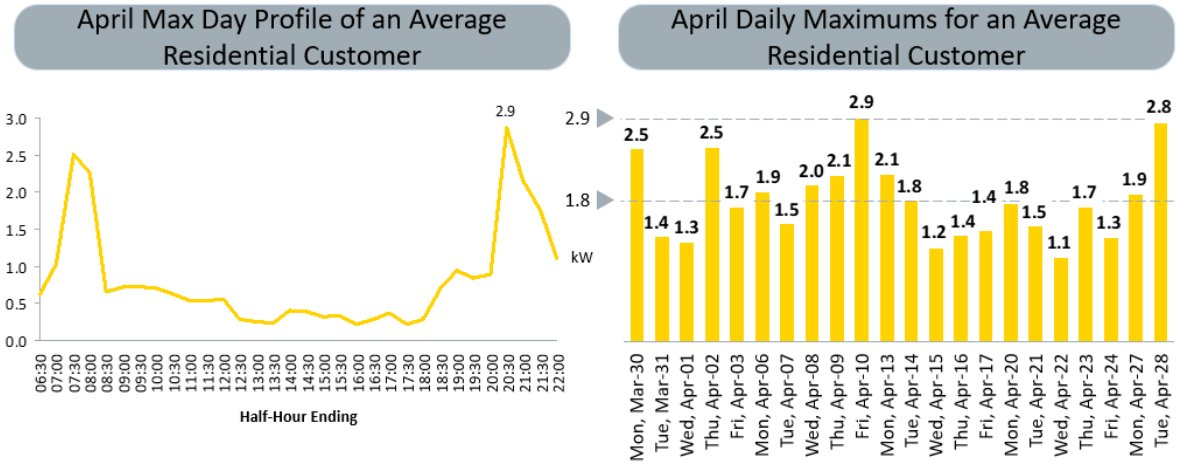
March 2020

1.10 Create an "EV fleet" commercial rate. Allows C&I customers to switch from a monthly demand charge to a more dynamic rate structure (e.g. average daily demand, dynamic TOU) **CPUC Comment: would average daily demand facilitate VGI? I can see the benefit for EV adoption in general and it would be helpful to explain how moderating the impact of demand charges would facilitate VGI**

VGIC Response:

An average daily demand could facilitate VGI depending on how the demand charge is structured. VGIC envisions a demand charge that would be more dynamic than the typical approach of using the monthly peak interval as the billing determinant. This alternative would instead base monthly billing demand on the average of the peak intervals for each day within the month. This would provide a price signal that better rewards customers who can monitor and respond to their EV charging load on a daily basis. This contrasts with a traditional demand charge, where there is little incentive to manage charging for the remainder of the month once a peak demand threshold is reached.

The charts below illustrate a simple example of this concept (in this case for a residential customer). In this example, the monthly maximum demand is 2.9 kW, while the average of each day's demand across all 30 days of the month is 1.8 kW. The same concept could be applied to a commercial customer.



This concept could be further extended such that the daily demand is computed only for demand coinciding with a peak-time window.

1.11 If dynamic rate is unavailable, increase the differential between standard and EV TOU Off-peak Charging rate (delivery portion)

VGIC Response:

Below is a compilation of the differential between key rate components among CA IOUs as an indication of the potential customer benefit from off-peak charging. Not all of these rates are yet in effect. Notably, there is a wide range of rate differentials among the IOU EV rate offerings. While VGIC has no specific recommendation at this time, we believe this can help inform future decisions regarding EV rate design. Note that most PG&E rates include a subscription charge, and SCE rates include a demand charge holiday that will phase out in the 2024 timeframe.

Rate	On-Peak	Off-Peak	Differential
PG&E EV-A, summer	$0.54121	$0.14232	$0.39889
PG&E EV-A, winter	$0.37957	$0.14567	$0.23390
PG&E EV-B, summer	$0.53525	$0.14189	$0.39336
PG&E EV-B, summer	$0.37322	$0.14521	$0.22801
PG&E EV2-A, summer	$0.48179	$0.16928	$0.31251
PG&E EV2-A, winter	$0.35468	$0.16928	$0.18540
PG&E BEV-1	$0.32858	$0.10991	$0.21867
PG&E BEV-2 S	$0.34490	$0.10840	$0.23650
PG&E BEV-2 P	$0.33694	$0.10540	$0.23154
SCE TOU-D Option Prime, summer	$0.39314	$0.13577	$0.25737
SCE TOU-D Option Prime, winter	$0.35943	$0.12932	$0.23011
SCE TOU-EV-7, summer	$0.41056	$0.14839	$0.26217
SCE TOU-EV-7, winter	$0.31791	$0.08496	$0.23295
SCE TOU-EV-8, summer	$0.49738	$0.12710	$0.37028
SCE TOU-EV-8, winter	$0.29831	$0.07865	$0.21966
SCE TOU-EV-9 (<2kV), summer	$0.44227	$0.10703	$0.33524
SCE TOU-EV-9 (<2kV), winter	$0.25703	$0.06890	$0.18813
SCE TOU-EV-9 (2-50kV), summer	$0.40891	$0.09854	$0.31037
SCE TOU-EV-9 (2-50kV), winter	$0.23603	$0.06493	$0.17110
SCE TOU-EV-9 (>50kV), summer	$0.30422	$0.07972	$0.22450
SCE TOU-EV-9 (>50kV), winter	$0.15389	$0.05749	$0.09640
SDG&E EV-TOU, summer	$0.55279	$0.19319	$0.35960
SDG&E EV-TOU, winter	$0.30540	$0.19392	$0.11148
SDG&E EV-TOU-2, summer	$0.55279	$0.19319	$0.35960
SDG&E EV-TOU-2, winter	$0.30540	$0.19392	$0.11148
SDG&E EV-TOU-5, summer	$0.50411	$0.08558	$0.41853

SDG&E EV-TOU-5, winter	$0.25672	$0.08631	$0.17041

1..16 NEM credit for V2G exports

CPUC Comment: combine with "credit for export" item above

1.14 Credit for export for V2G/storage

CPUC Comment: would the preference be direct credit on the customer bill or something more like an environmental commodity that could be aggregated and the customer receives repayment for their contribution to the overall aggregate?

VGIC Response:

The V2G NEM rate would expand the definition of Eligible Customer-Generator under the current NEM tariff options to include customers that own and operate EVs. The intent would be to effectively provide a bill credit to EV owners (at the full retail rate) for any exported energy discharged to the grid from EVs. To limit concerns about any potential cross-subsidies, this could be constrained, for instance, to exports occurring during peak hours (e.g. coincident system peak, or non-coincident class peak).

In addition to the retail bill credit, a supplemental credit could be considered for the environmental commodity component. This could be linked to the marginal emissions rate at the time of export (e.g. using WattTime) multiplied by a selected environmental commodity price or societal value.

2.12 Create an EV Dealership VGI upfront incentive program whereby utilities can reward dealers for installing or enabling VGI functionality at point of sale. Examples could range from simple to complex:
--Charge timer setting + EV TOU sign up (simple)
--Service reminder for future charge timer period adjustments (less simple)
--Real-time charging settings, with $/MWh thresholds (more advanced)
--Voltage control (even more advanced, enhanced by V2G)
--Discounted/rebated home L2 chargers if preprogrammed for defined VGI services (could be cofunded by utility & third party EVSP providers)

CPUC Comment: can you explain what didn't work so well in the past; and what could be improved based on this recommendation?

VGIC Response:

Through discussion with members, VGIC has heard anecdotally that attempts to provide dealership incentives for TOU rate enrollment have been attempted by California IOUs (e.g. SDG&E) but the results of these efforts have been somewhat mixed. VGIC does not have significant insight into how extensive these efforts have been or why they have been unsuccessful but believes they warrant further investigation.

Regardless of previous efforts, VGIC believes that if broad-scale VGI efforts are to be achieved, there is a critical need to encourage VGI functionality at the EV point-of-sale. It will likely be much more difficult and expensive to enable VGI functionality "after the fact" once EV adoption has already occurred. Additionally, this type of incentive should send a clear market signal to EV manufacturers and service providers that the power sector sees significant potential value in the ability for EVs with VGI functionality to deliver grid benefits. As monopoly utility providers, IOUs may not have a sufficiently strong incentive to pursue these grid benefits absent additional direction from the PUC.

As such, there is a need to ensure that EV adoption occurring in the near term can be leveraged for VGI functionality well into the future. Providing an incentive at the point of sale could be an effective way to do this. This is analogous to the approach taken by IOUs towards energy efficiency. For example, when customers are shopping for a new home appliance (e.g. washer/dryer) utility incentives can play a critical role in buying down the costs for more "grid friendly" devices. This "co-investment" model should extend towards EVs as well.

2.14 Create an EV Demand Response (System RA) Portfolio of Programs:
1. "Rush hour rewards"-style peak time rebate incentive program for EV owners/fleets/EVSPs who respond to utility signal to limit charging during critical peak periods;
2. DRAM-style procurement for capacity
3. Critical Peak Pricing (reduced rate except during critical peak periods)
4. Public Charging incentive/payment – customers provided a payment (or future free charging session) for agreeing not to charge during critical peak periods

CPUC Comment: can you elaborate and what programs don't exist and should be created; and what programs exist and should be revised for these options? i.e. DRAM procurments for the later

VGIC Response:

To VGIC's knowledge, there does not exist a robust set of utility programs focused on EV charging similar to what has been pursued for smart thermostats, such as the "Rush Hour Rewards" partnership between Nest and several IOUs (e.g. SCE). A similar suite of programs could be envisioned for EV charging. The whitepaper below provides some background

information on approaches to utility thermostat programs that could be leveraged for developing similar approaches to EVs.

https://www.peakload.org/assets/Groupsdocs/PractitionerPerspectives-UtilityBYOTPrograms-022818-Final.pdf

2.15 Public charger ancillary services program: --Provide a performance-based incentive for building owners, or EVSP providers, who recruit a certain fraction of EV drivers to opt in to allowing their EV to temporarily provide grid services (e.g. regulation) while parked. --Long-term contract through procurement

2.16 Non-wires alternative competitive procurement issued (RFO) targeted to EVs/EVSPs that can limit demand during peak times **CPUC Comment: as part of an existing procurement? If so, what would need to change? Or a new type of procurement process, and if so do you have suggestions on how to structure?**

VGIC Response:

While some participation might be able to occur under existing types of RFO structures, there are steps that could be taken to enhance participation for VGI solutions. For example, EV-related demand management could be specifically identified as a "preferred resource" that could receive preferential treatment in future RFOs. Additionally, utilities could specify a MW quantity of VGI solutions they are seeking in future solicitations. While this may not be ideal in all future RFO's from a technology neutrality standpoint, it may be warranted in the near term to aid market transformation of VGI technologies.

5.2 Pilot funding for V2H backup power solutions; Provide funding to test installation of gateway switches (or other solutions) for V2H backup at EV-owner homes in vulnerable communities

5.3 Pilot funding for V2G backup power solutions; Provide funding to test an EV-powered microgrid at community centers in vulnerable communities **CPUC Comment: nice to see numeric goals - any general target for overall MW capacity? or diversity to gain a broader range of experience?**

VGIC Response:

Assuming 10 kW per EVSE, and 30 LD vehicles per microgrid, that equates to 300 kW total or about 3 MW for 10 microgrids. Alternatively, if the grid was powered by school buses with 60 kW EVSEs then that equates to 18 MW. If a combination of these, then approximately 10 MW of EV microgrids seems appropriate as a near-term statewide target.

6.8 Establish cost-benefit evaluation framework for specific VGI programs/measures that are ratepayer funded. This should be considered in the larger context of TE programs as a whole (rather than evaluating individual VGI measures in isolation). **CPUC Comment: I think that this overlaps at least in part with a recommendation from Karim Farhat** **Do you have suggestions on what metrics would be used to determine cost/benefit and/or information sources to determine C/B?**

VGIC response:

For benefits, traditional metrics such as those used by the CPUC's Avoided Cost Calculator could be considered (e.g. avoided energy costs, avoided capacity, avoided emissions, etc). VGIC strongly encourages consideration of the ratepayer impact measure (RIM, including incremental utility revenues) in this evaluation to capture the full potential for VGI to enhance downward pressure on rates from EVs (see VGIC writeup on this submitted as part of Subgroup B).

Additionally, for cost metrics, only the incremental costs of VGI measures should be considered (which may be minimal in some cases since most costs are already embedded in the EV itself). VGIC recognizes that providing incremental cost data raises significant concerns among EV OEMs due to antitrust laws as well as the potential to inadvertently disclose competitively confidential information. This presents a novel challenge that is not typically present with traditional demand-side resources. VGIC has had some initial discussions with its members about the possibility of creating an anonymized, confidential VGI measure cost database that could be used for further analysis. VGIC would be interested in further exploration of this concept if it is of interest to the PUC staff.

9.7 Utilities develop coordinated marketing and education budgets to inform EV customers of dynamic rate options and VGI program opportunities through their TE plans. MEO for VGI ramps up in tandem with overall TE efforts