

VGI WORKING GROUP  
SUB-GROUP "A" ON VALUATION METHODOLOGY  
COMMENTS BY SUBGROUP STAKEHOLDERS DURING PERIOD 8/19-9/18  
Updated 9/24/19

This document contains the comments by Subgroup participants during the work of the Subgroup. Comments are differentiated between those based on the original methodology proposal presented to the Working Group at the 8/19 Workshop, and those based on a 9/12 Joint IOUs proposal. Resolutions are given by Gridworks as interpretations based on Subgroup discussions.

COMMENTS ON METHODOLOGY OVERALL

**PCE on original proposal:**

**Resolution:** was clarified during Subgroup discussions and addressed in 9/12 Joint IOUs proposal

- Vehicle types are not defined. Does this framework assume LD, MD, HD, or all the above? How does it capture evolving capabilities of vehicles (built-in charging controls, bi-directionality, VGI controls at fleet level, etc.)
- How are use-cases weighted against each other in terms of variables such as grid-impact, energy consumption, etc.? Is there a model that shows various use-cases and their charging profiles to help use as a variable in the prioritization process? For example, if a relatively low number of HD electric busses all begin charging during evening ramp-up, that might be enough of an impact to target as a unique use case due to it's impact.

**Enel X on original proposal:**

**Resolution:** was clarified during Subgroup discussions and addressed in 9/12 Joint IOUs proposal

1. The way the six steps are sequenced are set up well to answer the first WG scoping question, "What VGI use cases can provide value now, and how can that value be captured," especially in light of Step 3 to screen out "impractical" use cases based on technical feasibility, policy, customer adoption, or otherwise.

However, to answer the second scoping question, "What policies need to be changed or adopted to allow additional use cases to be deployed in the future," it would appear that the methodology needs to allow certain use cases that are deemed presently impractical to still go through the ensuing Steps 4-6. I'd be interested in discussing whether the WG could pursue parallel analyses – present v. future – through the remainder of the steps following Step 3.

2. In as much as certain use cases might be currently feasible and cost-effective, but for an enabling policy framework or market participation pathway, I'd argue that the order of

Steps 5 and 6 could be switched, with the Prioritization step coming at the end of the process. Of course, this really depends on what is meant by “prioritization” with regards to the outcomes of the working group, but I’d think we’d want to characterize technically feasible and cost-effective use cases as “high-priority” if we’re able to identify \*relatively\* painless policy / market fixes to enable those use cases.

**CESA on 9/12 Joint IOUs proposal:**

**Resolution:** the granularity provided in the framework is meant as a balance to help ensure that conversations can remain productive with relative detail. Many specific service valuations - such as reliability may be captured with a sufficiently granular signal. A significant portion of this is accomplished in Step 4 of the framework so as to not overly complicate the remainder of the Proposal. A significant amount of work from the MUA proceeding has been incorporated into this Framework, though there are still some unresolved questions from that proceeding that may need to be addressed in future Subgroup processes.

I heard Karim mention that the “Application” section was pulled from the Energy Storage Multi-Use Application decision and Working Group report. I think that is fine, and it fits in well with the VGI Working Group discussion questions around how VGI fits in with other DERs. Especially when it comes to determining “stackability”, the MUA framework is particularly helpful in assessing what can reasonably be stacked or not. For example, the MUA framework differentiated services by reliability versus non-reliability to indicate whether something can feasibly be stacked. Certain services require such high levels of reliability and delivery such that services cannot be stacked (Rule 6). At the same time, the MUA WG could not come to a solution around how to incorporate greater granularity of the stack – *i.e.*, two reliability services could be stacked if capacity is differentiated, or if the time of delivery of the service is differentiated by days, weeks, or months, which is limited by the policy framework in place (*e.g.*, RA is required on a year-ahead and month-ahead basis, and contracted on a multi-year timeline now). So the MUA work is helpful in filtering, but we should also recognize its limits.

**CESA on 9/12 Joint IOUs proposal:**

**Resolution:** still need to discuss, including reference to social benefits from PUC Code 740.8, where CEC responds: “ I am sharing an excerpt of the Public Utilities Code regarding ratepayer interests. I suggest that any VGI cost-benefit valuation analysis include the direct benefits highlighted here, which include needed electric services prone to procurement-type market modeling as described on the call (subsection a), safety and reliability benefits made available for instance from V2G (subsection a), and as suggested by another participant whose name I didn’t catch “non-energy” benefits, 5 of which are enumerated in subsection b.

[http://leginfo.legislature.ca.gov/faces/codes\\_displaySection.xhtml?sectionNum=740.8&lawCode=PUC#](http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=740.8&lawCode=PUC#)

I heard Noel (CEC) discuss how VGI use case valuation should be broader and even consider non-energy benefits. That was an interesting point and I think some clarity could be provided on what the framework is attempting to determine. I think value is broader than quantifiable revenues or ratepayer impacts.

**SMUD on 9/12 Joint IOUs proposal:**

**Resolution:** addressed in 9/24 updated Joint IOUs proposal

For the Sector dimension, we should consider including attributes for what the nominal dwell timing and energy recovery needs are. For example, suppose that residential charging nominally requires charging 9 kWh between 7 PM and 7 AM (either average figures or within a certain percentile). This will prevent baseline discrepancies depending on vehicle and/or EVSE brand (i.e. 6.6kW, 19.2kW, etc.). Beyond the nominal dwell and energy recovery attributes, I would characterize lower and higher charging as “curtail” or “boost” respectively.

## COMMENTS ON STEP 1: DEFINE A VGI FRAMEWORK

### **ChargePoint on original proposal:**

**Resolution:** was clarified during Subgroup discussions and addressed in 9/12 Joint IOUs proposal

The VGI Framework as proposed appears to identify the “EV” and “EVSE” as the main actors, along with the utility as the provider of direct or indirect signals. This is magnified by the Alignment category stating “misaligned” or “not aligned” when the EV and EVSE are not the same. ChargePoint would like to understand 1) why one common EVSE charging multiple EVs is not “aligned” and 2) how third party actors, including the site host and/or fleet operator, fit into this framework. For workplace, the EVSE has the ability to receive signals from the utility and align vehicles of multiple types to respond. Or a third party, such as the workplace itself, may be acting to align multiple types of EV and/or EVSE to achieve load management, with or without a signal from the utility. We worry that without clarification, this Framework could drastically fall short of identifying some of the most valuable VGI opportunities available at workplaces (where drivers are parked for longer periods of time) and fleet.

### **Fermata on original proposal:**

**Resolution:** keep to framework as much as possible, allow additional flexibility case-by-case?

Of the seven dimensions, do we need to define all the categories of those dimensions now or will there be opportunities to create new categories if a particular use case requires one? If new categories are not able to be created, will the use case itself or certain cost/benefits of the use case be excluded? (Gridworks had similar comments)

### **Fermata on original proposal:**

**Resolution:** was clarified during Subgroup discussions and addressed in 9/12 Joint IOUs proposal

When a new use case seems to suggest an expansion of the framework, will the group be able to discuss and consider the expansion at the time? What is available to be expanded? Can there be an eighth dimension in addition to new categories. (Gridworks had similar comments)

### **Fermata on original proposal:**

**Resolution:** was clarified during Subgroup discussions and addressed in 9/12 Joint IOUs proposal

Regarding Type, how should we consider power-flow to things that may be considered outside the “grid”? - For example: in a disaster scenario the general public charge their mobile devices from EVs dispatched throughout a city without grid power. Are these mobile devices considered part of the “grid” or a “microgrid”? If so, perhaps Type should be defined as bidirectional / unidirectional flow without any reference to where it is going (which can be addressed in Application) as the grid as can mean many different things to different people in different circumstances. If these are not part of the “grid”, does this mean the use case is excluded?

**Nissan on 9/12 Joint IOUs proposal:**

**Resolution:** addressed in 9/24 updated Joint IOUs proposal

The generalized Sector Elements don't include a differentiator for charge power level. There are load profile differences between L1 and L2 for instance, although both might be part of Residential - Single Family Home. There will also definitely be a need for some stacking of Sector Elements to account for opportunities and differences in driver charge access or use patterns (e.g. home, work or public charging locations). Those patterns will change what kind of VGI values could be created through managing charging across charging sessions rather than within a single charge session. (I notice charger power level has been added to the “Type” Element which might sufficiently resolve the charge power level issue.)

**Nissan on 9/12 Joint IOUs proposal:**

**Resolution:** addressed in 9/24 updated Joint IOUs proposal

"EVSE actor" should probably be clarified to be the party or parties who operate the electric charger under the utility meter. This would clarify that a building owner may be part of the electric charger operation if they are between the physical charger and the utility meter.

**FCA on 9/12 Joint IOUs proposal:**

**Resolution:** the framework should not be changed, but these considerations can be incorporated into the work of Subgroup B in the next stage of the Working Group.

There are too many Sectors. I'm willing to wait to see how these shake out but we really only need three Sectors, maybe four if Workplace is separated. This should be “where one charges/discharges” and why would it be so different if I have a garage and house (SFD) vs. MFD? The same function and amount of energy would be needed. (1) Home; (2) Public; (3) Private. Also too many Applications. Using SEP2 function sets could boil down to four. DER may be segmented if more grid services need separated but with Rule 21, not sure we have that option to pick and choose. (1) Price (incentives); (2) DRLC (curtailment/delays); (3) FlowReservation (energy, power, TCIN); (4) DER.

Using FlowReservation provides energy, power and TCIN so that sorts out variations to vehicles. One could have a BEV with a larger pack but only partially discharged so a PHEV could require more energy. That also sorts out larger vehicles bus and trucks.

This is signed so we know if it's charge or discharge.

Delete Type since this is part of the Application

## COMMENTS ON STEP 2: IDENTIFY HYPOTHETICAL USE CASES

### **ChargePoint on original proposal:**

**Resolution:** was clarified during Subgroup discussions and addressed in 9/12 Joint IOUs proposal, and these use cases can be provided to Subgroup B during the next stage of the Working Group.

Here are a few real use cases that we've identified, where we believe the EVSE or the third-party site host or fleet operator is a unifying actor, per our comment above on Step 1:

1. Workplace load management, no utility involvement – Many of our large workplace customers are using our station software to manage charging load without a price signal or demand response signal from their utility. This may be done to align with onsite renewables, data center or manufacturing, or to simply manage charging needs. One of our largest workplace customers has employees parked all day (they do not require employees to move their car when fully charged) so they use our software to reduce the speed at which the vehicles are charging; instead of charging at 100% from the start, they charging at 70 or 50% to spread the load across a longer period of time. EVSE software enables this to be centrally controlled by the workplace and the change in charging speed effects all types of vehicles plugged in.
2. Multiple EV, one EVSE, not separately metered, price signals –For most L2 outside of a utility charging station program, the stations would not be separately metered from the building load. This use case mostly applies to workplace or MUD, where our site host owns their own stations (we do not own the majority of our stations). The site host could be on a time of use rate for their entire facility or receive other price signals from the utility causing them to want to shift charging to a different time of day. While some site hosts may use our technology to change charging speed like in the workplace example above, others may simply set a price to drivers for the charging session that reflects the TOU periods. If the site host is setting pricing to drivers that applies across all drivers that use their private stations (MUD or workplace), how is that not aligned?
3. Ride sharing and public charging on same station – There are pilots underway with Lyft outside of California where Lyft drivers are provided a special price for charging (or provided for free) that is communicated from Lyft to the driver. This is to be used on stations that are also accessible by the public for charging. The charging station itself is owned by either a utility (example: PGE in Oregon) or an ESVP (example: EVgo/Maven) or a site host (we have several examples in Washington and Georgia). The ride share company is not managing the entire fleet that is using the stations since they can't control public users of that station. Instead, the site host (or utility or EVSP) is managing the multiple actors that use that same station using pricing controls, which could be adjusted to respond to TOU signals or other events (CPP, demand response) from the utility.
4. Mixed public and private charging - Some of our local government and fleet customers allow public access to their private charging stations during certain hours. For example, a city hall may

charge fleet vehicles at night but allow the public to use the stations for charging during the day. This city uses our software to set a pricing policy and access controls to enable these different functions to occur easily. If the utility were to direct some kind of VGI to occur, the city would need to translate that to meet their two very different use cases, likely using their EVSE's software or other notifications to drivers and fleet operators (signage, employee communication, etc). Again, the site host plays a vital role in aligning EV and EVSE.

5. Combined light duty and heavy duty fleet - We have a few customers that use fast chargers to charge both light duty fleet vehicles and medium or heavy duty (trucks or buses). In some cases, there is also onsite storage and/or solar contributing to this use case. The customer may use their EVSE software to manage the various fleet vehicles and make sure that all are getting fully charged when needed. (LA Air Force Base is likely the example you are most familiar with.) There is a mix of telematics information coming into the charging station and signals controlled by the fleet operator coming out of the station. The fleet operator is key to managing this use case.

### COMMENTS ON STEP 3: SCREEN OUT IMPRACTICAL USE CASES

#### **SMUD on 9/12 Joint IOUs proposal:**

**Resolution:** addressed in 9/24 updated Joint IOUs proposal

For Step 3 of the valuation methodology, for practicality we should consider approaching this from both sides simultaneously. For example, screening out impractical use cases yields many feasible use case combinations. It is probably also worth identifying widely explored or high interest use cases to prioritize the order in which the feasible use cases are tackled in subsequent steps and keep the number of concurrently analyzed use cases manageable. As a matter of work planning, this prioritization could allow for some subjectivity.

#### **EVBox on 9/12 Joint IOUs proposal:**

**Resolution:** discussed during Subgroup. Proposal to make a distinction between three scenarios: (1) possible under existing rules, (2) possible under rules that don't exist today but will exist "soon", or (3) not possible under current rules or in the revision period up to the analysis timeframe. Use case will only be filtered out if it is something that can't exist under current rules and the rules wouldn't be able to be adjusted before 2022. When you start on the next timeframe - until 2030 - almost everything will be possible since almost all rules will be able to be adjusted in that timeframe.

- Screening out use cases based on market rules will screen out any use case that is not related to market rules. For example, currently there are no rules for upgrade deferral, resiliency, voltage support are non-existent.
- How can you forecast "use cases that have significantly low customer adoption rate and/or participation rate, within the Timeframe?"

#### **Enel X on 9/12 Joint IOUs proposal:**

**Resolution:** Potentially two routes to answer (renumbered) PUC Question 3 (policy recommendations). First route is go through the framework and do everything based on

“now”, except in Step 6 we recognize that use cases fall into four buckets (a two-by-two value vs. implementability matrix). One interpretation of the Scoping Question is how can the “low value” cases be better valued/encouraged? How to improve the “implementability” aspect of lower value propositions. Alternatively, second route is to run through the entire analysis with a “future” approach (2022-2030). These are both fair points of discussion that will need to be continued.

I appreciate the further detail on the screens against which use cases can be evaluated for practicality, and on defining "Timeframe" buckets of "now" (2019-2022) and "the future" (2023-2030), which was one of the suggestions in my original comments. To reiterate my original comments, as I'm not sure this is explicitly mentioned in the new proposal: use cases that are characterized by any of the four screens as being practical (or having data available) in the 2023-2030 timeframe need to go through the ensuing steps 4-6 to respond to the WG's second scoping item.

**Nissan on 9/12 Joint IOUs proposal:**

**Resolution:** addressed in 9/24 updated Joint IOUs proposal

Technological feasibility screening based on California piloted or demonstrated technologies generally makes sense for the "now" period of 2019-2022, but not so much for the "in the future" timeframe of 2023-2030.

**COMMENTS ON STEP 4: QUANTIFY EACH USE CASE'S POTENTIAL BENEFITS AND COSTS**

**Fermata on original proposal:**

**Resolution:** was clarified during Subgroup discussions and addressed in 9/12 Joint IOUs proposal

Is there a full example of STEPS 1-4 for one or several use cases illustrating the impact of the Framework categorization on valuation results? A full example would include a full analysis of value with resulting metrics.

**Enel X on 9/12 Joint IOUs proposal:**

**Resolution:** these comments can be considered by Subgroup B in the next stage of the Working Group, when it comes time to identify and characterize all use cases.

Regarding "Benefits," it would behoove the group to develop or agree upon standardized inputs for all of the choices in the Sector, Application, and Type dimensions, to enable as much apples-to-apples comparison as possible. E.g., the "reference" EV charging profile and plug-in schedule should be the same for all residential LDV charging; battery characteristics should be the same for all LDVs; power level should be 7.5 kW for all Level 2 charging, etc. Overly simplistic, yes, but I envision a model where these parameters can be toggled to see how different inputs affect costs and benefits.

Regarding the benefits associated with the Application dimension, and further hinted at in "Additional guidance for quantifying VGI value" no. 5 on T&D -- potential grid benefits from VGI

vary greatly over time and space, not just for T&D deferral but also for things like energy, capacity, and resilience. Over the course of the WG we'll need to reconcile the delta between system-average values produced in the Avoided Cost Calculator with location-specific needs that could arise and provide high-value opportunities for VGI. One option is to allow members to raise certain use cases to evaluate against scenarios with above-average values, e.g., specified transformer upgrade, local capacity need, etc.

Regarding "Costs," all opex/capex needs to be defined solely in relation to the cost to provide the VGI service, incremental to "business-as-usual" EV or EVSE deployment. E.g., costs that would otherwise be incurred to sell and network EV and EVSE for non-VGI charging should be considered BAU, while the additional portion needed to sell and network EV and EVSE for VGI charging would be considered.

**Nissan on 9/12 Joint IOUs proposal:**

**Resolution:** addressed in 9/24 updated Joint IOUs proposal

The Application Step 4 input doesn't have the basic grid profile as a necessary item for the value calculation it's only using the existing economic signal. This would seem to miss the opportunity to identify values that are not already developed into an existing economic signal. It seems the calculation should at least have the larger economic value assigned to the grid profile for the selected application.

It seems quite difficult to establish Step 4 costs separate from the Approach element and considering the Resource Alignment. The concept of including costs but excluding Approach and Resource Alignment seems contradictory. Perhaps we are talking about a limited Approach and Resource Alignment assessment that doesn't include the customer response / system efficiency parts that would be part of a complete Approach and Resource Alignment assessment. Step 6 recommendations on which approach to use would also seem to undermine the cost assessments done in Step 4.

**COMMENTS ON STEP 5: PRIORITIZE USE CASES**

[No comments]

**COMMENTS ON STEP 6: INFER RECOMMENDATIONS ON POLICY, MARKET, OR TECHNOLOGY IN ORDER TO REALIZE AND/OR IMPROVE THE USE CASES VALUE**

**Nissan on 9/12 Joint IOUs proposal:**

**Resolution:** addressed in 9/24 updated Joint IOUs proposal

In Step 6, what basis is supposed to be used to recommend approaches to capture value when Approach and Resource Alignment have not been evaluated as part of the process? Based on the information developed through the process, it seems like recommendations should focus on identifying areas that could either improve net benefit or net benefit understanding and areas that increase opportunities for different approaches to capture the established net benefit.

