

## **VGI Working Group Two, Subgroup A**

### **Illustrative Use Case Process**

Applying the Joint IOU VGI Valuation Methodology

September 20, 2019

As part of the greater Vehicle Grid Integration initiative, a subgroup of the VGI Working Group Two met to conduct a collaborative trial of the Joint IOU Value Methodology to help members understand how it works.

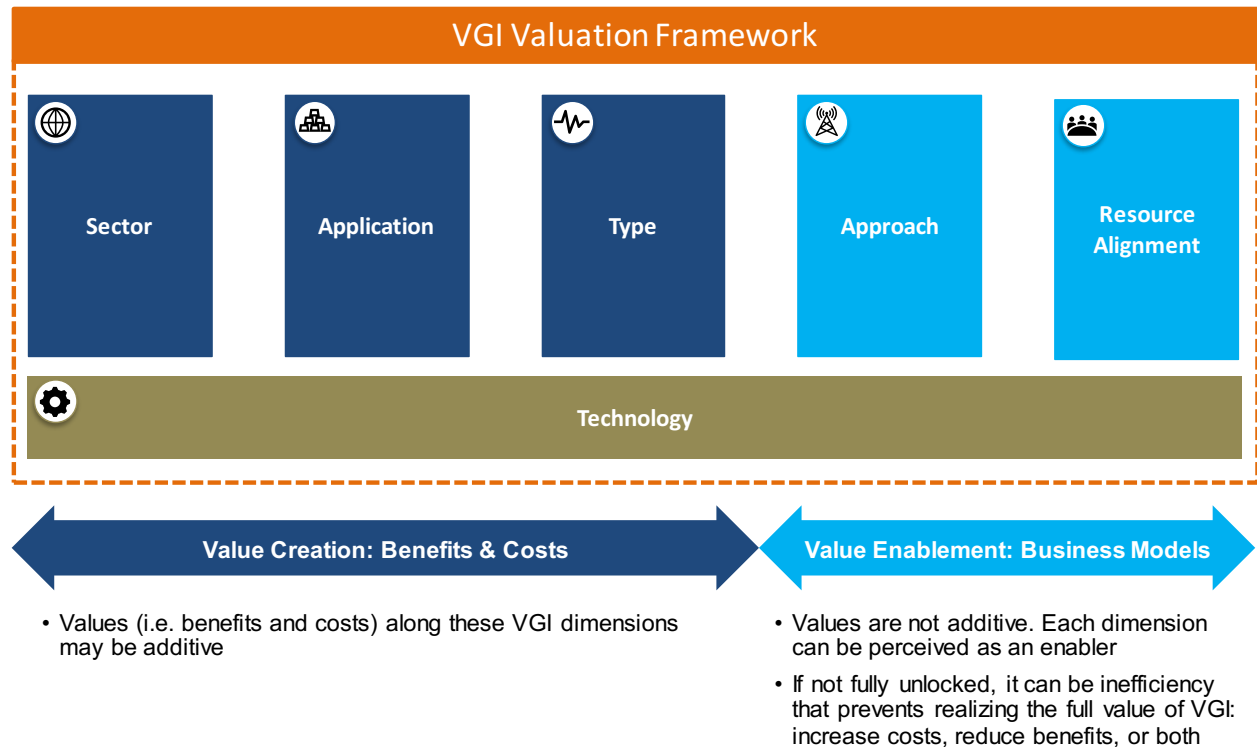
This memorandum summarizes and illustrates the subgroup's trial application of the process using a suggested use case submitted by Enel X's Marc Monbouquette to more deeply understand and produce feedback regarding the viability of a VGI application framed under the process. Collaboration on this trial and assessment included inputs from the following subgroup participants:

Dean Taylor, CalETC  
John Holmes, American Honda Motor Company  
Marc Monbouquette, Enel X  
Anne Smart, ChargePoint  
John Wheeler, Fermata Energy  
Karim Farhat, PG&E  
Jordan Smith, SCE  
Taylor Marvin, SDG&E

This exercise was suggested during a subgroup meeting held on September 13, 2019, wherein some participants volunteered for a breakout session, which was then scheduled for an hour on September 16, with a follow-on half-hour session the next day. The group discussed the various options under the six-step framework and agreed on the following classifications, steps, and ratings.

## Step 1: Define A VGI Framework

The subgroup used the Joint IOU proposed valuation framework:



## Step 2: Identify Hypothetical VGI Use-Cases

**Suggested Trial Concept:** *Load building with mid-day workplace charging to support GHG throughput and participate in CAISO market services*

<b><u>Sector</u></b>	Commercial Workplace
<b><u>Application</u></b>	Use-case #1 – Wholesale - Day-Ahead Energy Use-case #2 – Wholesale - Real-Time Energy (SUGGESTED, NOT COMPLETED) Use-case #3 – Wholesale - Renewable Integration (SUGGESTED, NOT COMPLETED)
<b><u>Approach</u></b>	Active – Load Shift Service, Dispatching
<b><u>Type</u></b>	V1G
<b><u>Resource Alignment</u></b>	Fragmented, Aligned
<b><u>Technology</u></b>	Light Duty, Level 2 AC Charging, OEM Aggregator

**Summary portfolio of the three distinct use-cases:**

<b>Dimension</b>	<b>Use-case #1</b>	<b>Use-case #2</b>	<b>Use-case #3</b>
<b>Sector</b>	Commercial – Workplace	Commercial – Workplace	Commercial – Workplace
<b>Application</b>	Wholesale - Day-Ahead Energy	Wholesale - Real-Time Energy	Wholesale - Renewable Integration
<b>Type</b>	V1G	V1G	V1G
<b>Approach</b>	Active	Active	Active
<b>Resource Alignment</b>	Fragmented, Aligned	Fragmented, Aligned	Fragmented, Aligned
<b>Technology</b>	Light Duty, Level 2 AC Charging, OEM Aggregator	Light Duty, Level 2 AC Charging, OEM Aggregator	Light Duty, Level 2 AC Charging, OEM Aggregator

Due to limited time, the group proceeded with only Use-case #1

### Step 3: Screen Out Impractical VGI Use-Cases

#### Use Case #1 - Wholesale Energy Day Ahead

*Agreed upon Timeframe for screening is “now”: 2019-2022*

##### *Screen 1 – Technological feasibility*

Screen 1 – This use-case passed, because, fundamentally, it has been implemented as part of CA IOU demonstrations, including in the BMW ChargeForward pilot

##### *Screen 2 – Market Rules*

Screens 2a and 2b – This use-case passed both screens a and b because load shift was addressed in a recent [Working Group](#), and the participants believe that tangible market services will be developed around load flexibility, within the “now” timeframe.

##### *Screen 3 – Customer preferences*

Screen 3a – This use-case passes without risk of compromising customer mobility needs, due to prior success, demonstrated in PG&E/BMW ChargeForward project and similarly under SCE’s Charge Ready Pilot

Screen 3b – This use-case passes without risk of significantly low customer adoption / participation, since the use-case is likely familiar and attractive to participants. Site owner permitted to opt-out, participant may elect to engage.

#### Screen 4 – Data Information

Screen 4a – Are data needs for this use case publicly available? Agreed answer: likely yes, due to Avoided Cost Calculator, knowledge of Day Ahead Market Prices. Therefore, the use-case passes.

Screen 4b – Do data needs and inputs for this use case available at all? Agreed answer: Yes.

Therefore, the use-case passes, concluding Step 3.

#### **Observation:**

May be clearer to “flip” the order of Screens 4a and 4b.

### Step 4: Quantify Each VGI Use-Case’s Potential Benefits and Costs

#### **Benefits:**

#### **Inputs for Sector:**

- (1) Reference: Likely AVAILABLE – There exists some form of reference charging profile, which refers to “unmanaged charging”. There is a known load profile over 24 hours, representative of location/application. Here, the capacity is determined by the capacity availability (EVSE type and count).
- (2) Plug-in schedule: Likely AVAILABLE – presumed known profile schedule and availability, indicating when the EV is connected and available to interact with the grid.

#### **Inputs for Application:**

- (3) An economic signal (e.g. price of service) to maximize or minimize charge/discharge over time. In this case it may be wholesale price from CAISO or other aggregator source.

#### **Inputs for Type:**

- (4) V1G
- (5) Battery characteristics or constraints – Likely AVAILABLE. Examples of assumptions include:
  - Battery capacity: 50 kWh
  - Minimum state of charge: 30%
- (6) EV-EVSE characteristics/constraints (e.g. energy demand for mobility needs, level of charging, etc.) – Likely AVAILABLE. Examples of assumptions include:
  - Mobility energy need: 10 kWh/day
  - Maximum charge rate: 10 kW

## **Costs:**

### **Administrative Costs**

Includes any of the following quantifiable costs:

- Design and development
- Operations and maintenance
- Marketing and sales
- IT and Cybersecurity
- Evaluation, measurement, and verification
- Reporting

### **Capital Costs**

Includes any of the following costs:

- Equipment (hardware)
- IT (software)
- Backhaul services

### **Discussion**

The accounting in the cost buckets is clear, but need to have a discussion on what is “incremental for VGI”, and what is base and already used for TE more broadly.

## **Step 5: Rank VGI Use-Cases by Practical Net Benefits**

Criterion 1: Ranking based on net-benefit → ??? With respect to other use-cases

Criterion 2: Ranking based on “implementability” → Consensus score: 3

### **Discussion:**

Might be more constructive to use term “telematics” to refer to communications in this example, not OVGIP, since that was a particular implementation.

### **Observation:**

Reaching consensus on the scoring on Criterion 2 might be time-consuming, so might need some support from Gridworks on that to streamline the process.

## Step 6: Make Recommendations on Policy, Market, or Technology in Order to Realize and/or Improve the VGI Use-Cases' Value

- Working with CAISO to help materialize load flexibility as an actual market-based service
- Having a discussion around the exact compensation architecture for customers
- Broadening the technology specs to include telematics more broadly, without specific focus on the example of OVGIP

## Summary of Subgroup Inputs to Working Group

### **Discussion:**

Perhaps recommendations can also include identifying gaps?

### **Final thoughts:**

General agreement on the value of the exercise in helping participants understand how the method works and gaining comfort with using it to proceed on the next phase of VGIWG.