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Additional submitted attachment is included below.

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1. Of the candidate use-cases and vehicle types listed above, which ones should we prioritize in this solicitation and why?

a) Will distribution capacity constraints be a major barrier to the deployment of the charging infrastructure needed for that use-case in the short- to medium- term?
   a. A major barrier for the successful deployment of medium- and heavy-duty (MDHD) battery electric vehicles (BEVs) in the short term will be potential capacity constraints in distribution circuits.
      One of the major reasons is the critical size of MDHD BEV that has charge rates ranging from 10kW - 1500kW per charger for a vehicle.
      Moreover, in the vision of a future grid with low carbon resources, it is expected that facilities with MDHD BEVs will have large number of charging equipment to be more efficient in using these vehicles for their intended application.
      A third reason is its applicability. A major success in the evolution of Light Duty BEV charging infrastructures is that most LD BEV are idle during day times and can be charged when the solar is peaking. This is not the case with MDHD vehicles as they are in operation during day times resulting in the need for being charged during the nights. This results in MDHD BEV charging infrastructures relying on the grid during the nights resulting in potential capacity constraints.

b) Will vehicles and charging equipment be readily commercially available in the short- to medium-term?
   a. The technology for such vehicles and their charging equipment exist. With the increased push from local authorities and regulatory bodies for increased deployment of MDHD BEV, such technologies are expected to be commercial in the short-term. There is a major motivation for MDHD BEV than LD BEV for many stakeholders in California. This is mainly because MDHD BEV offer much higher per-vehicle greenhouse gas and criteria emissions reductions due to the higher utilization and emissions of conventional alternatives.

c) Are there market and policy influences driving electrification in the use-case now?
   a. Low carbon emissions requirements in California and other states
   b. EV incentives, multiple Incentives and Rebates for developing charging infrastructure for MDHD vehicles
   c. CA Executive order to boost state electrification goals to 5 M ZEVS by 2030 and 250,000 EV charging stations by 2025 ,which include heavy duty vehicles
   d. CA Air Resources Board to drive Electric Bus Adaption and fleets to ZEVs by 2040
   e. Loan programs etc.

d) Are there use-cases that would particularly benefit from the reliability and resiliency value of the DER strategy?
   1. We come across the need for reliability and resiliency today in California for critical infrastructures, emergency shelters, remote islands/locations without n-1 contingency, people who live in locations that are more prone to natural disasters etc. under emergency conditions. MDHD BEV charging vehicles and their infrastructure can provide added

reliability and resiliency by acting as major source of energy enhancing resiliency of the grid (including microgrids) with high penetrations of PV systems during such critical events.

2. For electric utilities, managing the operation of such infrastructures using DER management systems (DERMS) can increase asset utilization resulting in operation of existing assets (e.g., transformers, feeders etc.) closer to their capacity limits.
3. For electric utilities, the deployment of DERMS to address capacity constraints created by MDHD BEV infrastructures helps defer capital deployments.
4. For end customers, it reduces the cost of upgrading the infrastructure needed for accommodating MDHD BEV
5. For end customers, it increases the speed at which interconnection requests are approved for charging infrastructures
6. For customers, it offers increase in savings by avoiding demand charges

e) Are there vehicle types that are particularly suited to providing reliability services to the grid or to individual buildings during an outage?
   a. Today, most inverters within electric vehicles are grid following inverters that can follow the voltage and frequency command from a master DER. In this case, the expectation is that they will work with onsite stationary storage which acts as the grid forming DER. With the local DER management system (DERMS), their combined operation could be optimized to provide enhanced reliability.
   b. The fleet MDHD BEV vehicles, heavy duty MDHD BEV vehicles etc. combined with intelligent charging systems, smart DER energy management controls and V2G (vehicle to grid capabilities) and VGI infrastructure, combined with PV, onsite energy storage with Aggregation could serve as potential source of power to support building loads and grid reliability services.

f) What incentive or funding mechanisms already exist to support MDHD fleet operators looking to electrify?

g) What is the total potential market size in California for the use-case?

h) Which use-cases have the most potential to replicate the DER package and achieve a meaningful scale?

All the above listed under d).

2. What is the best way to characterize the grid impacts and other costs associated with deploying MDHD BEV charging infrastructure without a managed charging/DER strategy?

a) What metrics should be used to evaluate the cost and performance of the baseline incumbent technology? Metrics currently under consideration include:
   i. Itemized balance of system costs considering both site host costs and utility costs,
   ii. Carbon intensity,
   iii. Cost of delays associated with upgrading upstream distribution systems/substations, and
   iv. Risks associated with long-term investments in permanent upgrades.

In addition, we should also consider,

1. Zero to negative potential for increasing asset utilization of utility grid infrastructure
2. Increased cost of infrastructure upgrades

3. Existing infrastructures are not reliable and resilient during critical emergency events like flood, wildfire, cyber-attacks etc.

b) What information about existing grid infrastructure, beyond the Integration Capacity Analysis (ICA) maps, is needed to evaluate capacity constraints that could limit deployment of MDHD BEV charging infrastructure?

In addition to ICA maps, utilities may also require information about the status of switches and breakers for reconfiguration. After reconfiguration of feeders, the ICA values may be different in real time resulting in levels of capacity constraint.

3. How does the target technology need to improve?

a) What are the current balance of system costs associated with deploying DERs as a non-wires solution for integrating MDHD BEV charging equipment?
b) What publicly available resources provide visibility into these costs?
c) What types of costs can be further reduced through innovation and require demonstration (e.g., soft costs, software, design, hardware, permitting, interconnection, etc.)?
d) What is the revenue-generation potential and business model for the targeted technology (e.g., customer bill savings, low carbon fuel standard, wholesale market participation, distribution grid services, resiliency, etc.)?
e) What metrics can be used to evaluate cost and performance attributes of the targeted technology?
f) How can those metrics be normalized across different use-cases and project sizes (e.g., ratio of PV size to stationary energy storage size, ratio of soft costs to hardware costs, load factor on the utility distribution system, resiliency/reliability metrics)?
g) How well can the targeted technology meet the operational requirements of the priority use cases?

4. What level of investment would be needed from EPIC to make a meaningful difference on this issue?

a) What size of a project should we be targeting (MW, MWhs, number of charging ports, number of vehicles, etc.)?
b) What portion of the DER equipment costs should be covered by EPIC in order to appropriately incentivize site host participation?