

Action	What does success look like?	Timeframe	Category	Relevant Use Cases	Submitted by
<p>1.1 Rate design for demand charge mitigation to enabled by stationary battery storage coupled to EV charging</p> <p>CPUC Comment: can you explain how this would work? would installing a battery enable host site to get some additional demand charge subsidy or just some structurally different unsubsidized rate?</p>	Provides a rate structure for facilities that have the capability to charge EVs from on-site stationary battery storage	2020	1. Retail rate reforms	850.1, 850.2, 853, 854	BMW-GM-Honda-Nissan-Ford
<p>1.2 Reduce or eliminate demand charges for DCFC, but scale up with utilization to create more demand-responsive rate.</p> <p>CPUC Comment: PG&amp;E rate case is approved; SDG&amp;E rate is pending. none of these rates offer what is being requested per se. are you requesting a subsidized DCFC specific rate request that is different from these rates?</p>	DCFC installations increase to meet EV demand.	2020	1. Retail rate reforms	V1G use cases involving DCFC.	Energy Innovation
<p>1.3 In order to both capture the value from currently "favorable" use-cases and unlock the value of currently "unfavorable" use-cases: EV drivers across all sectors must be gauranteed direct access to their utilities' time-variant (e.g. TOU) rates, which are cost-competitive especially during off-peak periods. To achieve this objective, utilities must be allowed the option to own and/or operate at least a portion of the charging stations across all sectors (e.g. residential, commercial workplace, commercial public destination, commercial public commute, MDHD), so their rates are directly available to EV drivers.</p> <p>CPUC Comment: Could you clarify why direct IOU ownership is necessary to pass through EV rates to drivers? PG&amp;E offers a rate-to-driver option in its EV Charge Network program, what have been the results of that portion of the program?</p>	EV drivers across all sectors are able to make use of their utilities' time-variant rates to charge during cheap off-peak periods and realize bill savings on their EV total cost of ownership.	2020	1. Retail rate reforms	PRIME-Flex "favorable" and "unfavorable" / Type = V1G / Application = Customer Bill Management / Approach = Indirect. Use-cases: 1.1; 1.2; 205.0; 410.0; 614.0; 817.0; 818.0; 1022.0; 1226.0; 1430.0; 1633.0; 1634.0; 2245.1; 2245; 2449.1; 1837.2; 2041; 2450.1; 2246.1; 1837.3; 1838.2; 1837.5; 2042; 2246; 1837.4; 1837.6	Karim Farhat

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<p>1.4 Apply Station Power concept to V2G</p> <p>CPUC Comment: please describe station power</p>	<p>Resolution of FERC 841/wholesale-retail problem</p> <p>CPUC Comment: Would this require a national shift or action by FERC (and potentially CAISO as well)? Or is it something the CPUC can implement unilaterally?</p>	2020	1. Retail rate reforms	All V2G use cases	Nuvve
<p>1.5 Establish EV TOU rates that don't require separate/submetering (significant customer cost). Allow vehicle data to be used as input to utilities for settlement to customer. Also- having a standardized TOU rate format across IOUs would be helpful.</p> <p>CPUC Comment: TOU time periods and costs are designed to recover the cost of specific utility service territories. Why is having it standardized preferred for this use case specifically?</p>	<p>Separation of EV TOU from whole home TOU that enables greater customer enrollment to align EV charging with lowest-cost electricity, and/or dynamic pricing.</p> <p>CPUC Comment: is the idea that the vehicle would operate as an EV "submeter"? How could the IOUs test the EV accuracy? What happens if a customer changes service territories?</p>	2021	1. Retail rate reforms	Customer bill management, Real Time Energy, Day-Ahead Energy, Renewable Integration	BMW-GM-Honda-Nissan-Ford
<p>1.6 Establish optional dynamic rate schedules for EV charging that pass through time- and location-specific price signals that reflect, at a minimum, energy, delivery, and GHG</p>	<p>Availability of and customer enrollment in dyanmic EV charging rate schedules; customers responding to price signals in kind to charge during lowest-priced times</p>	2021	1. Retail rate reforms	Applications: DA and RT energy, GHG reduction, distribution deferral	Enel X

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<p>1.7 To ensure effective capturing and realization of value from EV flexible load: the retail price signal received by the EV customers (drivers and/or site hosts) should be reflective of realistic, time-variant cost of energy. Unless proved necessary in select circumstances, all EV charging rates should be time-variant, and current TOU rate design (by IOUs, CCAs, and private entities) should continue to evolve and improve to be more reflective of realistic costs of energy and grid conditions. Importantly, time-variability of EV rates should never be too complex for customers to comprehend and use.</p>	<p>Retail EV charging rates are reflective of realistic cost of energy generation and delivery. Most EV rates are 3-tier or 4-tier TOU (super-off-peak; off-peak; partial-peak; peak) to maintain simplicity, with optional more complex alternatives such as dynamic rates.</p> <p>CPUC Comment: this can be combined with many of the retail rate reform proposals (1)</p> <p>Reply: for general block TOU rates do you recommend TOU rates different from general opt-in TOU rates that are phasing in currently for residential customers</p>	2021	1. Retail rate reforms	PRIME-Flex "favorable" / Approach = "Indirect" (53 LDV use-cases; 34 MHDV use-cases)	Karim Farhat

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<p>1.8 To ensure effective capturing and realization of value from EV flexible load: At any particular time the day, the pricing signal received by the EV customers (drivers and/or site hosts) should be relatively consistent (not necessarily identical) across different sectors and price-setting entities. For example, charging at 2pm within the same geographical region should not be deemed "off-peak" on one IOU rate but "partial-peak" on another IOU rate or CCA rate. Harmonizing different EV rates by different entities, so they are consistent in any given time window, is important for customers to adjust their charging behavior and develop healthy, predictable, and robust charging habits. At the very least, different price-setting entities should agree on the time window where "off-peak" rates apply.</p> <p>CPUC Comment: is the basic issue that an IOU T&amp;D tariff could define TOU periods differently than a CCA energy tariff? Or are you also concerned that an IOU(s) does or could offer unbundled T&amp;D and energy tariffs that could conflict with each other, and if the later are there specific customer classes - i.e. commercial - that you are concerned about ?</p>	<p>The structure of time-variant rates is consistent and similar across charging sectors (e.g. residential vs. commercial) and price-setting entities (e.g. IOUs, CCAs, private providers, etc.). Ideally, different price-setting entities would agree on how to define and segment the "off-peak", "partial-peak", and "on-peak" periods.</p> <p>CPUC Comment: similar to many of the retail rate reform proposals</p>	2021	1. Retail rate reforms	PRIME-Flex "favorable" / Approach = "Indirect" (53 LDV use-cases; 34 MHDV use-cases)	Karim Farhat
<p>1.9 To ensure effective capturing and realization of value: the pricing signal received by the EV and that received by the EVSE should be aligned and consistent (not necessarily identical) with one another and should incentivize/deincentivize the same charging/discharging action.</p>	<p>Provisions in publicly funded TE and VGI programs and projects requesting detailed explanation of the implemented mechanisms to ensure alignment between EV and EVSE actors</p>	2021	1. Retail rate reforms	PRIME-Flex "favorable" / Resouce = "Fragmented" / Approach = "Indirect" (28 LDV use-cases; 6 MHDV use-cases)	Karim Farhat

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<p>1.10 Create an "EV fleet" commercial rate. Allows C&amp;I customers to switch from a monthly demand charge to a more dynamic rate structure (e.g. average daily demand, dynamic TOU)</p> <p>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</p>	Majority of commercial EV fleets have access to, and have opted into, an EV Fleet Rate and have implemented managed charging to achieve bill savings	2021	1. Retail rate reforms	All MHDV Customer bill management use cases	VGI Council
<p>1.11 If dynamic rate is unavailable, increase the differential between standard and EV TOU Off-peak Charging rate (delivery portion)</p>	Substantial bill savings are realized from EV TOU rates and constitute an important driver of overall EV adoption	2021	1. Retail rate reforms	All LDV Customer bill management use cases	VGI Council
<p>1.12 Establish voluntary Base Interruptible Program and/or Critical Peak Pricing tariffs for public or workplace charging</p>		2021	1. Retail rate reforms	Type: V1G Approach: Indirect (CPP); Direct (BIP) Applications: DA and RT energy, GHG reduction, distribution deferral	Enel X
<p>1.13 Utility tariffs modified to allow for customers with on-site solar and/or storage to utilize commercial EV rates</p> <p>CPUC Comment: would you suggest breaking-out EV charging &amp; discharging? or everything goes in the same bucket? and do you know why an EV rate is not allowing for EV charging &amp; solar on the same meter for commercial, is that related somehow to credits for power export to the grid?</p>	<p>Implementation of new Commercial EV tariffs allowing on-site stationary storage/renewables</p> <p>CPUC Comment: Can you explain in more detail why having the solar + storage enrolled on an EV-specific rate would be beneficial, rather than leaving the solar +storage on a broader facility rate? Is the solar + storage directly tied to the EVSE somehow?</p>	2-5 years	1. Retail rate reforms	Renewable Self-Consumption, Customer Bill Management for transit fleets	MHDV Team

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1.14 Credit for export for V2G/storage	Some form of credit for export from a V2G system, this does not have to be traditional "net metering"  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?	2-5 years	1. Retail rate reforms	All V2G use cases	Nuvve
1.15 Prompt CPUC approval of time-varying EV rates applications  CPUC Comment: does draft TEF and/or existing CPUC policy provide enough guidance?Reply:	General availability of time-varying EV rates	2-5 years	1. Retail rate reforms	All V1G use cases	SCE-SDG&E-PG&E
1..16 NEM credit for V2G exports  CPUC Comment: combine with "credit for export" item above	All EV owners have access to a NEM option for EV TOU rates; participating customers are discharging to grid during times of peak demand	2-5 years	1. Retail rate reforms	All customer bill management use cases	VGI Council
1.17 Performance-based ratemaking  CPUC Comment: you mean performance-based IOU rate of return with IOUs evaluated and incentivized based on ability to reduce expenses via VGI?	Op-ex element added to utility rate of return calculation  CPUC Comment: you mean T&D specifically?	long term and future	1. Retail rate reforms	Though there is a case to be made that this would be helpful to EVERY EV use case under consideration here, upgrade deferral use cases are the most obvious specific application, so cases in the ranges of 1800, 1900, 2000, 2100, 2200, 2300, 2400, 2500, 1000, 1100, and cases 1277, 1478, 1481, 1682, 1685, 1686, 866, 869, 870, 872, 874, 875	Nuvve
2.1 Require utilities to broadcast signals to a DER marketplace of qualified vendors (curtailment and load)  CPUC Comment: is a payment system needed? or just signalling when some type of action is needed?	Competitive market for dispatch of EVs among all DER	2020	2. Utility customer programs, incentives, and DER procurements	All use cases	BMW-GM-Honda-Nissan-Ford

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<p>2.2 V2G systems become eligible for some form of SGIP incentives. One or several budget categories for V2G systems could be established along with residential, commercial, equity, etc. Large scale, commercial pilots could be used to develop the program.</p> <p>CPUC Comment: This overlaps with a several</p>	<p>V2G charger systems deployed accomplishing the following:</p> <p>Per: D.16-06-055</p> <ol style="list-style-type: none"> <li>1. Environmental benefits: reducing GHG emissions and criteria pollutants and the limitation of other environmental impacts;</li> <li>2. Grid support: the reduction or shift of peak demand, improved efficiency and reliability of the transmission and distribution system, lowered grid infrastructure costs, the provision of ancillary services, and ensuring the reliability of customer distributed energy resources;</li> <li>3. Market transformation: supporting technologies with the potential to thrive in future years without rebates;</li> <li>4. Maximizing ratepayer value; and</li> <li>5. Providing for equitable distribution of benefits among customer classes.</li> </ol> <p>Additionally:</p> <ol style="list-style-type: none"> <li>6. Accomplishes 1-5 with high cost effectiveness in terms incentives funded by ratepayers and in terms of overall costs to</li> </ol>	2020	2. Utility customer programs, incentives, and DER procurements	<p>Depending on details of a proposed program, all V2G use cases could eventually apply. For the "now" timeframe (2020 through YE 2022), all use cases below would use offboard DC chargers.</p> <p>That said, the following use cases "Group A" can be done today without any major changes to policy or markets and will have commercial products available in 2020 or 2021: 31, 34, 416, 419, 440, 443, 826, 827, 848, 850, 851, 7, 10, 19, 431, 839, 130, 539, 946, 947, 1028.</p> <p>Additional use cases "Group B" associated with these sectors could also be added but would need some action by utilities and/or policy change or market access. These include: 67, 70, 115, 118, 476, 479, 527, 884, 886, 887, 899, 922, 924, 925, 46, 142, 455</p>	Fermata
<p>2.3 Institute shared benefit structure for LCFS or similar funding between host site and EV driver/operator/owner</p>	<p>Increased EV adoption by workplace sector targeted at MUD and public access parking drivers; V1G and V2G uptake</p> <p>CPUC Comment: is the goal to increase charger adoption in general? or increasing V1G and V2G once chargers are installed?</p>	2021	2. Utility customer programs, incentives, and DER procurements	817, 818, 820, 821, 901, 902, 853, 854	BMW-GM-Honda-Nissan-Ford
<p>2.4 Establish "reverse EE" rebates (pay for performance?) for EVSE installations that build permanent midday load</p> <p>CPUC Comment: do you recommend up-front payment for equipment installation and/or per kWhr payments? Do you recommend prioritizing/ starting with any particular sector?</p>	<p>Availability and customer uptake of load building rebates</p>	2021	2. Utility customer programs, incentives, and DER procurements	Applications: DA and RT energy, renewable integration	Enel X

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2.5 Enable customers to elect BTM load balancing option to avoid primary or secondary upgrades, either if residential R15/16 exemption goes away, or as an option for non-residential customers	Availability and customer uptake of load balancing option, potentially provided for in Rules 15 and 16	2021	2. Utility customer programs, incentives, and DER procurements	Applications: customer upgrade deferral; distribution deferral	Enel X
2.6 Require managed charging capability in utility customer programs, incentives, and DER procurements.	Installed charging infrastructure that is rate-based has managed charging capability.	2021	2. Utility customer programs, incentives, and DER procurements	All VGI use cases.	Energy Innovation
2.7 Require all government-funded charging infrastructure to have smart functionality.	Installed charging infrastructure funded by the state predominantly has managed charging capability.	2021	2. Utility customer programs, incentives, and DER procurements	All VGI use cases.	Energy Innovation
2.8 Create a strategic demand reduction performance incentive mechanism, include EVs as technology that can reduce and shift peak demand.  CPUC Comment: can you comment on current DR procurements, and what should change to encourage EV participation?Reply: and do you recommend specifically shifting load to match renewables; or just reduce/shift similar to traditional DR?note that if the later, overlaps w/ suggestion on row 17	Utilities reduce peak demand partially using active demand management with EVs.	2021	2. Utility customer programs, incentives, and DER procurements	All VGI use cases.	Energy Innovation
2.9 The Commission should consider bundled utility and CCA incentives for EVs, solar, inverters, and EV chargers to support resiliency efforts in wildfire prone, and therefore PSPS prone, areas.  CPUC Comment: overlaps with recommendation from Karim and Fermata; for commercial customers why only customers with CCA service?	Utilities and CCAs offer incentives for EVs, solar, inverters, and EV chargers to support customers in PSPS areas.	2021	2. Utility customer programs, incentives, and DER procurements	All single-family home back-up/resiliency use cases. Commercial customers that opt-in to CCA tariff.	Energy Innovation



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2.10 Leverage existing pilots in the state to identify major bottlenecks for increasing deployment and reducing costs. Encourage utilities, in partnership with private entities, to establish dedicated programs or sub-programs (under MDHD) for School Bus charging solutions	A clear roadmap for the deployment of VGI solutions for School Bus charging in the state up until 2030.	2021	2. Utility customer programs, incentives, and DER procurements	PRIME-Flex "unfavorable" / Sector: School Bus / Type: V1G. Use-cases: 2044; 2128; 2176	Karim Farhat
2.11 Standard design templates for ALL DERs including Evs  CPUC Comment: is the goal helping developers save time during desing? and/or speeding IOU approval? and can you suggest any examples?	Templates for EV connections and interconnections with pre-approved 1-line and 3-line diagrams	2021	2. Utility customer programs, incentives, and DER procurements	All V2G use cases	Nuvve
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 cofounded by utility & third party EVSP providers)	Majority of new EV sales have some form of VGI functionality enabled	2021	2. Utility customer programs, incentives, and DER procurements	All LDV Customer bill management use cases	VGI Council
2.13 SGIP-style battery rebate for pairing with high power DC fast charging  CPUC Comment: would be useful to consider consolidating SGIP-related recommendations.	Co-installation of batteries with high-power/fast charge installations both for public charging and at private sites	2-5 years	2. Utility customer programs, incentives, and DER procurements	Cases in the ranges of 1000, 1100, 1200, 1300	Nuvve

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<p>2.14 Create an EV Demand Response (System RA) Portfolio of Programs:</p> <ol style="list-style-type: none"> <li>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;</li> <li>2. DRAM-style procurement for capacity</li> <li>3. Critical Peak Pricing (reduced rate except during critical peak periods)</li> <li>4. Public Charging incentive/payment - customers provided a payment (or future free charging session) for agreeing not to charge during critical peak periods</li> </ol> <p>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</p>	<p>IOUs (or CCAs) are able to meet a meaningful portion of their system RA requirements (e.g. 100+ MW) from EV DR programs</p>	2-5 years	2. Utility customer programs, incentives, and DER procurements	<p>All System RA use cases: 133, 136, 142, 337, 340, 542, 545, 746, 749, 949, 950, 952, 953, 958, 959, 1153, 1154, 1157, 1158, 1361, 1362, 1565, 1766, 1769</p>	VGI Council
<p>2.15 Public charger ancillary services program:</p> <p>--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.</p> <p>--Long-term contract through procurement</p>	<p>CAISO/IOUs have successfully procured AS from EV customers for a sustained period of time</p>	2-5 years	2. Utility customer programs, incentives, and DER procurements	<p>System Frequency Regulation use cases: 581, 989, 994, 995. Others AS not identified as a use case: spinning reserves, non-spinning reserves</p>	VGI Council
<p>2.16 Non-wires alternative competitive procurement issued (RFO) targeted to EVs/EVSPs that can limit demand during peak times</p> <p>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?</p>	<p>IOUs have successfully procured a distribution deferral through EV/EVSP procurement</p>	2-5 years	2. Utility customer programs, incentives, and DER procurements	<p>Grid upgrade deferral use cases: 49, 52, 253, 256, 458, 461, 866, 869, 870, 872, 874, 875, 1074, 1277, 1478, 1481, 1682, 1685, 1686</p>	VGI Council

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<p>3.1 Authorize new tariffs in CAISO ESDER Phase 4 that allow utilities to pay V1G aggregators to use managed charging to reduce the local distribution grid impacts of EV charging.</p> <p>CPUC Comment: authorize IOU tariffs? or would CAISO pay directly? and please spell out ESDER</p>	<p>The creation of a tariff specific to V1G aggregators. Aggregator participation in the program.</p> <p>CPUC Comment: would this tariff be able to be for all V1G/V2G services or does it have to be specific /different for each VGI service type?</p>	2021	3. Wholesale market rules & access	All V1G use cases.	Energy Innovation
3.2 Allow telemetry at aggregation level	<p>Telemetry monitored by CAISO at the RIG/aggregation level to allow better optimisation of distributed assets by third parties prior to AGC signal reacting to SOC of individual assets in the aggregation</p> <p>CPCU Comment: what is the AGC signal and how would it respond to SOC of vehicles?</p> <p>Reply: if the idea that an aggregator manages individual vehicles/sites and then transmits data? if so, is your each that the aggegator have a different approach to dispatch vehicles while making sure that customer preferences are met and thus could better optomize; or are you thinking of something else?</p>	2021	3. Wholesale market rules & access	989, 994, 995, If MDHD sheet included frequency regulation it would be more viable for those than for LDV	Nuvve

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<p>3.3 Solve critical issues with DERP-NGR to enable MUAs and the economic integration of aggregated BTM V2G in CAISO markets: 24x7 market integration for DERPs; lack of coordination between DERPs and LSE, resulting in double payment for charging energy; clarify applicability of and standardize / streamline WDAT interconnection process</p> <p>CPUC Comment: please spell out acronyms and say what you think should change; for instance what is unclear and what is ad-hoc or cumbersome with interconnection rules?Reply: same as Nuve NGR recommendation?</p>		2-5 years	3. Wholesale market rules & access	V2G applications for DA and RT energy; System / Local / Flex RA; Frequency Regulation; (others?)	Enel X
<p>3.4 Solve critical issues to enable aggregated BTM V2G to provide RA: storage exports receive no RA value, limiting value proposition; aggregated BTM V2G (+ all storage) lacks an NQC value</p> <p>CPUC Comment: please explain NQC; is there a specific rule or policy that prevents storage from participating in RA? is that related to NQC?</p>		2-5 years	3. Wholesale market rules & access	V2G applications for System / Local / Flex RA	Enel X
<p>3.5 Incorporate V1G opportunities in the DRAM program, once reinstated permanently.</p>	EVs in aggregate participate in DRAM, which is predominantly a day-ahead market.	2-5 years	3. Wholesale market rules & access	85, 88, 292, 901, 902. Applies to similar medium/heavy duty and V2X use cases as well.	Energy Innovation

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<p>3.6 Enable aggregations of EVs on managed charging to participate as resources in real-time energy markets and ancillary services market.</p> <p>CPUC Comment: what policy actions are needed? I think that the barriers column identifies at least some.</p>	<p>EVs in aggregate participate in wholesale markets, which are closest to meeting real-time grid conditions.</p> <p>CPUC Comment: i think this can be combined with one or more of the rate reform proposals above?</p> <p>Reply: If not, please explain why</p>	2-5 years	3. Wholesale market rules & access		Energy Innovation
<p>3.7 Enable aggregations of EVs on managed charging to meet RA requirements.</p> <p>CPUC Comment: what change is needed? note that Nuvve has made recommendations re: allowing a 100 kW bid threshold.</p>	<p>Aggregated EVs charged with clean electricity can be a clean resource to meet RA requirements.</p> <p>CPUC Comment: This can be combined with the proposal above and probably some of the rate reform proposals</p>	2-5 years	3. Wholesale market rules & access		Energy Innovation
<p>3.8 In order to both capture the value from currently "favorable" use-cases and unlock the value of currently "unfavorable" use-cases: Need for clarity and conclusive decision on what pathway (PDR vs. NGR) will enable V2G resources to offer Day-Ahead Energy and RA System services; if PDR is the chosen pathway (preferred), then need for clarity on the timeline and roadmap to get there.</p>	<p>Clear pathway under CPUC and CAISO for V2G to offer Day-Ahead and RA System Capacity services.</p>	2-5 years	3. Wholesale market rules & access	PRIME-Flex "favorable and "unfavorable" / Type = V2G / Application = Day-ahead Energy; RA System Capacity. Use-cases: 2134; 2134; 2182; 1930.2; 1930.1; 142.0; 908.0; 958.0; 959.0; 1316.0	Karim Farhat

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<p>3.9 CPUC develops accounting/operational standards governing retail versus wholesale charging for V2G applications. Utilities may need to develop subtractive billing to net out wholesale charging. Specifically pilot for electric school buses, which will have high idle time and may be full market participants for part of the year. This pilot can also inform how V2G should qualify for Resource Adequacy going forward</p> <p>CPUC Comment: is the issue buy retail for storage and sell at wholesale rates and/or paying add-on when buying for storage and not recovering when selling wholesale? or having access to wholesale markets at all (a CAISO issue?)</p>	<p>School bus EVSEs operating as NGR or DERA in wholesale market</p> <p>CPUC Comment: and buy/sell storage at wholesale rates, while paying retail for transportation electricity use?</p>	2-5 years	3. Wholesale market rules & access	School Bus, V2G Direct, Day-Ahead energy, real-time energy, RA	MHDV Team
<p>3.10 CAISO allows for BTM resources to participate in Frequency Regulation without 24/7 wholesale settlement</p> <p>CPUC Comment: is the ask to sell for increments of time rather than 24/7 availability; or rates; or other payment issues?is this related to other comments re: NGR?</p>	Integration of MHV fleet as NGR into Frequency Regulation Markets	2-5 years	3. Wholesale market rules & access	Frequency Regulation applications (potential for any MHV, likely best for school/commuter fleet)	MHDV Team
3.11 Allow 100 kW threshold bid for A/S	Smaller resources access all markets	2-5 years	3. Wholesale market rules & access	989, 994, 995, if MDHD sheet included frequency regulation it would be more viable for those than for LDV	Nuvve
<p>3.12 Resolve NGR issues for BTM aggregation market access</p> <p>CPUC Comment: same as ENEL X, MHDV team recommendation re NGR? or do you recommend other specific actions?Reply: ,, and if so what actions?</p>	CAISO states that it has done its part here. Success is real assessment of CAISO's claims and assessment of remaining obstacles on the CPUC side to chart path for MUA/ESDER to address this.	2-5 years	3. Wholesale market rules & access	All V2G use cases	Nuvve
<p>3.13 Authorize new tariffs in future phases of CAISO ESDER that allow utilities to pay V1G aggregators to use managed charging to reduce the local distribution grid impacts of EV charging.</p> <p>CPUC Comment: same as earlier ESDER recommendation? or different?</p>	The creation of a tariff specific to V2G. Participation in the program.	long term and future	3. Wholesale market rules & access	All V2G use cases.	Energy Innovation

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<p>4.1 Allow V1G (Smart Charging/Managed Charging) to be counted as storage for Storage Mandate</p>	<p>Executed vehicle programs. Programmatic support through the storage mandate could be applied to V1G programs to accelerate scale</p>	<p>2020</p>	<p>4. Market transformation , costs and benefits, increasing customer adoption</p>	<p>All use cases</p>	<p>BMW-GM-Honda-Nissan-Ford</p>
<p>4.2 In order to both capture the value from currently "favorable" use-cases and unlock the value of currently "unfavorable" use-cases: Dedicate specific efforts that allow TNC/Rideshare drivers to reduce their costs by benefiting from utility and other publicly-funded programs and rates. This includes, but is not limited to: (1) a clear pathway for TNC/Rideshare to participate in utility programs for commercial charging (DCFC and L2) and to benefit from make-ready infrastructure and charger rebates, including an option for dedicated or semi-dedicated (during specific periods of the day) chargers; (2) a clear pathway for TNC/Rideshare to participate in state-funded programs like CaleVIP; (3) gauranteeing direct access to utility rates for TNC/Rideshare drivers reliant on public charging, per Recommendation 11.</p> <p>CPUC Comment: can you please clarify 1) do you think IOUs should have DCFC programs, or just if they do it should be open to TNC and what does that look like - conventional wisdom is that DC FC are not likely to play in the VGI market but is there an opportunity specific to TNCs? that they tend to charge mid-day because of downtime, and/or that their charging pattern could be flexible?; 2) how would excluding non-TNCs provide VGI benefits; 3) I am not sure which recommendation is #11, lets sync up you numbering with the overall spreadsheet</p>	<p>A clear pathway for Rideshare/TNC to benefit from publicly funded TE programs and cost-competitive charging rates.</p> <p>CPUC Comment: CPUC has consistently provided policy direction that the TNC/Rideshare companies must share the costs of any dedicated/semi-dedicated infrastructure paid for with public funds. none of the IOU programs have included any cost sharing proposals</p>	<p>2020</p>	<p>4. Market transformation , costs and benefits, increasing customer adoption</p>	<p>PRIME-Flex "favorable and "unfavorable" / Sector = Public, Rideshare / Type = V1G / Application = Customer Bill Management. Use-cases: 1226.0; 1228.0; 1633.0; 1634.0; 1636.0; 1637.0; 1230.0</p>	<p>Karim Farhat</p>

Action	What does success look like?	Timeframe	Category	Relevant Use Cases	Submitted by
<p>4.3 In order to both capture the value from currently "favorable" use-cases and unlock the value of currently "unfavorable" use-cases: As a mechanism to capture the benefits of GHG Reduction and Renewable Integration, improve the allocation of LCFS credits such that: (1) EVs with higher VMT (e.g. rideshare, MDHV) earn higher amount of credits, regardless of the party claiming/filing for those credits (utilities, OEMs, etc.); (2) EV drivers or their designated/chosen agents have a streamlined process that enables them to claim these credits directly if they choose to; (3) at least 70% of the LCFS credits are guaranteed to be channeled back to the EV driver or their designated/chosen agent, regardless of the claiming/filing party.</p> <p>CPUC Comment: I think that #1 and #3 overlap, is that correct? i.e. #1 is the general objective and #3 is the specific metric (could mention #3 under metrics)Also, you are suggesting a streamlined process for EV drivers to capture the value of a stream of credits over time? What should change from the current LCFS rules?</p>		2020	4. Market transformation , costs and benefits, increasing customer adoption	PRIME-Flex "favorable and "unfavorable" / Sector = Rideshare; MHDV / Type = V1G / Application = GHG Reduction, System Renewable Integration: 2353; 2365; 2356; 2368; 1945.2; 1957.2; 2354; 1948.2; 1949.2; 1958.2; 1958.3; 1957.3; 1946.2; 1337.0; 1338.0; 1746.0; 313.0; 725.0; 734.0; 1753.0; 328.0; 316.0; 737.0; 1334.0; 1349.0; 1741.0; 1742.0; 1744.0; 1745.0; 1756.0; 1757.0	Karim Farhat
<p>4.4 Perform detailed cost-effectiveness analysis to quantify the impact on EV customer, ratepayer, utility, and society at large. This applies to use-cases under both Direct and Indirect approaches. For every use-case: Parties that scored the said use-case as "favorable" are strongly encouraged to support in the detailed cost-effectiveness analysis (while mindful of anti-trust concerns); not providing such support may risk de-favoring and therefore de-prioritizing the said use-case.</p> <p>CPUC Comment: how granular would you suggest? i.e. each one; or do you think that they could be aggregated?</p>	Detailed cost-effectiveness analysis for each use-case, to be made public and updated regularly (every 2-3 years).	2021	4. Market transformation , costs and benefits, increasing customer adoption	PRIME-Flex "favorable" use-cases (144 use-cases)	Karim Farhat



Action	What does success look like?	Timeframe	Category	Relevant Use Cases	Submitted by
<p>4.5 For every transportation electrification plan, project, or program that (1) is supported or subsidized by public funds, (2) applied at commercial scale (200+ EVs or 100+ EVSEs); and is to be deployed in the next 1-5 years: Prioritize and properly document and implement one or more of the cost-effective use-cases. Every TE program or project meeting the three criteria above must include the deployment of one or more cost-effective VGI use-cases.</p> <p>CPUC Comment: 1) are you recommending just documenting what use case(s) are advanced? or other information, and if so do you have a template or example in mind?2) do you think that the same numbers would apply to all projects (i.e. passenger EVs/EVSE vs. MDHC EVs/EVSE)</p>	<p>One or more of the PRIME-FLEX VGI use-cases are properly designed, documented, and executed in every transportation electrification project or program that: (1) is supported or subsidized by public funds, (2) applied at commercial scale (200+ EVs or 100+ EVSEs); (3) is deployed in the next 1-5 years.</p>	2021	4. Market transformation , costs and benefits, increasing customer adoption	PRIME-Flex "favorable" use-cases (144 use-cases)	Karim Farhat
<p>4.6 Initiate a voluntary task-force to help gather, model, and analyze data related to these use-cases' benefits and costs. Prioritize the analysis of these use-cases within the VGI Data Program initiative proposed by CalEITC in the DER Roadmap</p>	<p>Clear understanding and documentation of benefits and costs</p>	2021	4. Market transformation , costs and benefits, increasing customer adoption	Use-cases where data is not available or partially available (total of 244 use-cases)	Karim Farhat
<p>4.7 Increased pilots exploring shared charging infrastructure for commuter-based fleets, both public and private.</p> <p>CPUC Comment: for both public &amp; private, do you mean buses and/or passenger vehicles? Do you intend to manage charging, or rather to encourage a use case that you believe has VGI benefits regardless?Reply: also, note that Karim has provided a recommendation around TNCs that might overlap</p>	<p>Increased daytime charging of commuter fleets, lower total infrastructure costs</p>	2-5 years	4. Market transformation , costs and benefits, increasing customer adoption	Renewable Integration application with Commuter buses/shuttles	MHDV Team
<p>5.1 Bring automakers to the table to agree to allow limited discharge activity for resilience purposes to be kept under warranty if customers are willing to pay for upgraded bi-directional charging hardware.</p>	<p>All automakers allow at least some discharge activity for resilience purposes.</p>	2020	5. V2G, V2H, and Public Safety Power Shutoffs (PSPS) Solutions	All single-family home back-up/resiliency use cases.	Energy Innovation

Action	What does success look like?	Timeframe	Category	Relevant Use Cases	Submitted by
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	500 homes with V2H backup by end of 2020  CPUC Comment: I think that Karim also has numeric goals in a policy recommendation	2020	5. V2G, V2H, and Public Safety Power Shutoffs (PSPS) Solutions	Home/building backup power use cases. LDV: 31, 34, 440, 443, 848, 850, 850.1, 850.2, 851, MHDV: 2479, 2482	VGI Council
5.3 Pilot funding for V2G backup power solutions; Provide funding to test an EV-powered microgrid at community centers in vulnerable communities	10 community centers with V2G backup by end of 2021	2020	5. V2G, V2H, and Public Safety Power Shutoffs (PSPS) Solutions	Home/building backup power use cases. LDV: 31, 34, 440, 443, 848, 850, 850.1, 850.2, 851, MHDV: 2479, 2482	VGI Council
5.4 Enable BTM V1G/V2G to provide supply, capacity, or other services in FTM sectionalized microgrids  CPUC Comment: what actions do you recommend that the CPUC/IOUs take? How would you prioritize them?	Creating new framework; VGI assets winning and delivering on contracts  CPUC Comment: any thoughts on kW or kW-hr goals?	2021	5. V2G, V2H, and Public Safety Power Shutoffs (PSPS) Solutions	System -- Backup, Resiliency	Enel X
5.5 Require that electric buses funded under the School Bus Replacement Program have managed charging and V2G functionality.  CPUC Comment: I think that the CEC agrees and adopted this policy.	School buses at least partially funded by the state have the ability to participate in V2X activities.	2021	5. V2G, V2H, and Public Safety Power Shutoffs (PSPS) Solutions	826.1, 826.2, 850.1, 850.2	Energy Innovation
5.6 Update Innovative Clean Transit Rule to include school buses.	Diesel buses across the state are rapidly replaced with electric buses.  CPUC Comment: can you suggest a goal such as x buses; y kW capacity available for VGI?	2021	5. V2G, V2H, and Public Safety Power Shutoffs (PSPS) Solutions	826.1, 826.2, 850.1, 850.2 initially for V2B, then V2G school bus use cases	Energy Innovation

Action	What does success look like?	Timeframe	Category	Relevant Use Cases	Submitted by
<p>5.7 (1) Set a state goal (floor) of having EVs providing emergency backup generation during PSPS events: At least 100 EVs by mid 2021, and at least 500 EVs by mid 2022. This could be implemented as one pilot or a portfolio of pilots across California, with the requirement of interconnecting to the "main" grid (not microgrids) of one or more of the utilities.</p> <p>(2) Utilities to consider the feasibility of EVs for emergency backup generation as part of their PSPS plans over the next 2-3 years. Per Recommendation 1, cost-effectiveness shall continue to be a major criteria for evaluating the feasibility of EVs for backup generation.</p>	<p>EVs providing emergency backup generation services during PSPS events: At least 100 EVs by mid 2021, and at least 500 Evs by mid 2022.</p>	2021	5. V2G, V2H, and Public Safety Power Shutoffs (PSPS) Solutions	<p>PRIME-Flex "favorable" / Sector = "Resi SFH" / Application = "Customer - Backup, Resiliency". Use-cases: 31; 34</p>	Karim Farhat
<p>5.8 Leverage EPIC funding to pilot some use-cases in order to: (1) better understand realistic costs and implementation challenges; (2) identify concrete ways to reduce cost and streamline implementability. The pilots would cover both sectors Workplace and MUD. Among other activities: strongly endorse the "Distributed Energy Resource Solutions for Medium- and Heavy-Duty Electric Vehicle Charging" initiative launched by the CEC.</p> <p>CPUC Comment: would additional background from CEC be useful on what else they have in place or planned in addition to the initiative mentioned here?</p>		2021	5. V2G, V2H, and Public Safety Power Shutoffs (PSPS) Solutions	<p>PRIME-Flex "unfavorable" / Application = "Customer - Backup, Resiliency" and "System - Backup, Resiliency". Use-cases: 67.0; 70.0; 440.0; 443.0; 476.0; 479.0; 848.0; 850.0; 850.1; 850.2; 851.0; 884.0; 886.0; 887.0</p>	Karim Farhat
<p>5.9 Explicitly prioritize these use-cases to be included in the next cycle of PRP submissions by one or more of the IOUs, as well in the next phase of EPIC funding.</p>		2021	5. V2G, V2H, and Public Safety Power Shutoffs (PSPS) Solutions	<p>PRIME-Flex "unfavorable" / Sector: School Bus / Type: V2G / Application: Customer Bill Management. Use-cases: 2047; 2050</p>	Karim Farhat

Action	What does success look like?	Timeframe	Category	Relevant Use Cases	Submitted by
<p>5.10 In order to both capture the value from currently "favorable" use-cases and unlock the value of currently "unfavorable" use-cases: Drastically simplify NEM tariffs and streamline NEM applications for EVs; explore possibility for (simplified) NEM tariff specifically for EVs. Along the same lines, strongly encourage better communication of EV TOU and NEM rates to the general public and other business entities.</p> <p>CPUC Comment: applications = IOU applications to CPUC?</p>	<p>Updated/New NEM design/architecture and application process that are at least as simple, clear, and streamlined as EV TOU rates.</p>	2021	5. V2G, V2H, and Public Safety Power Shutoffs (PSPS) Solutions	PRIME-Flex "favorable and "unfavorable" / Type = V2G / Application = Customer Bill Management. Use-cases: 7.0; 10.0; 416.0; 419.0; 826.0; 826.1; 826.2; 827.0; 827.1; 827.2; 828.0; 1028.0; 2458.1; 2047; 2047; 2050; 1843; 1846;	Karim Farhat
<p>5.11 Update CalGreen to have EV-capable measures apply to existing schools to support electric school bus purchases, with make-ready support from IOUs.</p> <p>CPUC Comment: can you define IOU role? supporting CALGreen and/or paying for or building additional infrastructure not required by CALGreen?</p>	<p>Make-ready infrastructure is installed at all schools across the state to support electric bus adoption.</p>	2-5 years	5. V2G, V2H, and Public Safety Power Shutoffs (PSPS) Solutions	826.1, 826.2, 850.1, 850.2	Energy Innovation
<p>5.12 Create tariffs specific to electric school buses that potentially account for V2G.</p> <p>CPUC Comment: is the goal to establish rates for V2G? or some type of policy? if just the former, suggest migrating to category 1 (or consolidate if there is already a similar recommendation in that category)</p>	<p>School buses can be utilized as stationary batteries and the power can be sent back to the grid or school buildings.</p>	2-5 years	5. V2G, V2H, and Public Safety Power Shutoffs (PSPS) Solutions	V2G school bus use cases.	Energy Innovation
<p>5.13 Consider technologies beyond rooftop solar in NEM 3.0, such as vehicles and storage, to start building the policy framework for export DER technologies.</p> <p>CPUC Comment: note other recommendations re: NEM/credit for export</p>	<p>Net-exporting BTM technologies can be compensated for excess electricity sent back to the grid. Customers participate in compensation program</p>	2-5 years	5. V2G, V2H, and Public Safety Power Shutoffs (PSPS) Solutions	All V2G use cases.	Energy Innovation

Action	What does success look like?	Timeframe	Category	Relevant Use Cases	Submitted by
<p>5.14 Develop standards and requirements for buildings which will support the use of the EV's main power batteries for customer resiliency</p> <p>CPUC Comment: do you mean technical standards for enabling infrastructure in T24 Part 6? and/or Rule 21, or building electrical code?</p>	<p>1) The capability to use an EV as an emergency power for the home built in to the EV -or- as an add-on accessory to the EV</p> <p>2) Electrical standards/procedures developed to allow the isolation of critical loads in the building from the utility allowing them to be powered by the EVs main batteries</p> <p>CPUC Comment: do you mean allow, in the sense that a rule allows V2H? or provides physical infrastructure to enable?</p>	2-5 years	5. V2G, V2H, and Public Safety Power Shutoffs (PSPS) Solutions	Use cases for Residential sectors which include resiliency such as: 31, 34, 67, 70, 440, 443, 476, 479	SCE-SDG&E-PG&E
<p>5.15 Create tariffs specific to medium/heavy duty vehicles and fleets (rideshare, for example).</p> <p>CPUC Comment: this may fit with the category 1 rates recommendationsReply: also, do you recommend a particular type of rate? TOU, dynamic TOU, and/or some type of credit for export to grid?</p>	Medium/heavy duty vehicles and fleets can provide grid benefits based on their unique usage patterns.	long term and future	5. V2G, V2H, and Public Safety Power Shutoffs (PSPS) Solutions	Medium/heavy duty use cases. Fleet use cases, including rideshare.	Energy Innovation
6.1 Permit Streamlining	<p>Faster, lower cost permitting</p> <p>CPUC Comment: the message from a group of about a dozen more rural AHJs when previously a consultant - solar has it figured out. So maybe solar can offer specific timeframes to aim for?</p>	2020	6. Other/General Approaches	All use cases	BMW-GM-Honda-Nissan-Ford
6.2 Investigate ADA and other obstacles to charger installation at MUDs and some high density C&I locations	Increased participation by MUDs in IOUs programs for installation of EV charging infrastructure	2020	6. Other/General Approaches	Multi-family 410, 413.1, 431.2, 458, 617	BMW-GM-Honda-Nissan-Ford
6.3 Incentives for new construction -- public parking lot projects	Provides an incentive for projects that include public parking lot EV charging infrastructure with new construction, including specific call outs for each V1G and V2G	2020	6. Other/General Approaches	Public parking lot infrastructure use cases	BMW-GM-Honda-Nissan-Ford

Action	What does success look like?	Timeframe	Category	Relevant Use Cases	Submitted by
<p>6.4 Incentives for Title 24 new construction -- MUDs and some C&amp;I (especially workplace and large destination) parking facilities</p> <p>CPUC Comment: see #61 re. T24 CALGreen as the mechanism</p>	<p>Provides an incentive for projects that include MUD and residential EV charging infrastructure with new construction, potentially tied to Title 24 for a period of, e.g., 3-5 years</p>	2020	6. Other/General Approaches	All MUD and residential use cases	BMW-GM-Honda-Nissan-Ford
<p>6.5 Incentive(s) for construction projects with coincident grid interconnection and EV infrastructure upgrade</p> <p>CPUC Comment: do you mean locating EVSE where grid capacity is available? or that piggy-backing capacity for EVSE onto utility-side grid upgrades or building electrical room capacity needed to serve the basic building needs during new construction in order to achieve economies of scale? The later should be mandatory for 10% of parking spaces @ 208/240 volts 40 amp each under current CALGreen MUD and pending CALGreen workplace; though this is not enough to meet long-term EV goals and there are variations in how well CALGreen is enforced at the local level.</p>	<p>Incentivizes projects that couple facility retrofit/upgrades with EV charging infrastructure</p> <p>CPUC Comment: how does this differ from the LDV infrastructure programs approved in 2016 (and under review for expansions in Charge Ready 2 and Power Your Drive 2)?</p>	2020	6. Other/General Approaches	All use cases	BMW-GM-Honda-Nissan-Ford
<p>6.6 Use the proposed Joint IOU VGI Valuation Framework (6 dimensions) and associated use-cases to reference, articulate, and communicate about VGI in policymaking across CA state agencies. The 6 dimensions (Sector, Application, Type, Approach, Resource Alignment, and Technology) can be used as a starting point to reference specific VGI use-cases, with additional details added as necessary. Specifically, strong recommendation to use the Joint IOU VGI Valuation Framework as the foundational framework for VGI in the Transportation Electrification Framework under the DRIVE OIR.</p>	<p>All VGI use-cases are communicated, documented, and referenced consistently across TE/VGI initiatives and across CA state agencies.</p> <p>CPUC Comment: what does this look like beyond the final report from this working group?</p>	2020	6. Other/General Approaches	Other	Karim Farhat

Action	What does success look like?	Timeframe	Category	Relevant Use Cases	Submitted by
<p>6.7 Across all agencies: Public funding of VGI use-cases should prioritize initiatives, projects, and programs that involves formal collaboration between at least one load serving entirt (utility or CCA) and at least one automaker or EV service provider.</p> <p>CPUC Comment: do you think that this is a higher priority for some types of use cases compared to others? i.e. in some cases coordination is fundamental for developing/implementing technical standards or implementing demonstrations; in other cases it may be beneficial for market education.</p>	<p>VGI projects and/or programs involve formal partnerships among multiple parties.</p> <p>CPUC Comment: should the other parties be expected to provide joint funding as part of the collaboration?</p>	2021	6. Other/General Approaches	PRIME-Flex "favorable" use-cases (144 use-cases)	Karim Farhat
<p>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).</p> <p>CPUC Comment: I think that this overlaps at least in part with a recommendation from Karim Farhat</p>	<p>Framework is adopted and can be used to help prioritize VGI actions/investments as a means to leverage ratepayer funding through public purpose programs</p>	2021	6. Other/General Approaches	Potentially all use cases, but possibly more important for System Benefit use cases	VGI Council
<p>6.9 Update CalGreen to require installed charging infrastructure (not just EV-capable), with managed charging capability. Eventually go beyond new buildings to existing buildings.</p> <p>CPUC Comment: see #59 re using T24 as mechanism</p>	<p>Chargers installed in new construction have load management capability.</p> <p>Comment: can be combined with two recommendations from OEMs above</p> <p>Reply: suggest not using load management unless you mean management of load across EVSE, which is how some people use this term though usage is very inconsistent</p>	2-5 years	6. Other/General Approaches	All VGI use cases.	Energy Innovation
<p>6.10 Align LCFS smart charging framework IOU TOU rates.</p> <p>CPUC Comment: See Karim Farhat LCFS policy recommendation with additional details</p>	<p>Beneficial charging behavior; more funding for electric mobility.</p>	2-5 years	6. Other/General Approaches	All V1G use cases (SFH, MUD, commercial, DCFC)	Energy Innovation

Action	What does success look like?	Timeframe	Category	Relevant Use Cases	Submitted by
<p>7.1 Create pilots to demonstrate V2G's ability to provide the same energy storage services as stationary systems. Additionally, let V2G systems participate in pilots for stationary energy storage. These pilots would utilize, commercially deployed V2G systems - see "Group A" use cases in recommendation #1. The purpose of the pilots is test V2G effectiveness in performing grid applications which are not currently accessible. These new "stackable" applications would be added to and complement base applications such as customer bill management which are accessible today.</p> <p>CPUC Comment: I suggest looking at the CEC request for comments on grant funding opportunities for 19-ERDD-01 (12/9/2019) which seems to at least partially respond to this recommendation</p>	<p>More accessible applications for V2G systems, particularly true V2G "grid" services that increase use cases beyond solely "V2B" vehicle-to-building and "V2H" vehicle-to-home.</p>	<p>2020</p>	<p>7. Demonstration &amp; technology support</p>	<p>Base use cases in "Group A" to serve as a host to test stacking pilot use cases - i.e. base ones can be done today without any major changes to policy or markets and will have commercial products available in 2020 or 2021: 31, 34, 416, 419, 440, 443, 826, 827, 848, 850, 851, 7, 10, 19, 431, 839, 130, 539, 946, 947, 1028.</p> <p>Actual Pilot use cases to test stacking with base use case: "Group B" requires some action by utilities and/or policy change or market access. These include: 67, 70, 115, 118, 476, 479, 527, 884, 886, 887, 899, 932, 934, 935, 46, 142, 455, 575, 860, 862, 863, 872, 874, 875, 908, 958, 959, 970, 971, 972, 994, 995, 1088, 1316, 1436, 1640, 1700, 1748</p>	<p>Fermata</p>
<p>7.2 Special programs and pilots for Municipal fleets to pilot V2G as mobile resiliency. V2G has particular value for municipal fleets as a mobile, resiliency response asset. This includes resiliency use cases and other use cases not contemplated in this work group such as ones related to disasters and emergencies. These could be piloted in a similar context as described in recommendation #2.</p> <p>CPUC Comment: what are the main outcomes of the pilots?</p>	<p>Greater EV adoption in municipal fleets that can also serve as a mobile resiliency asset. Greater resiliency and cost effectiveness providing it.</p>	<p>2020</p>	<p>7. Demonstration &amp; technology support</p>	<p>Start with V2B, municipal fleet use cases in Group A</p>	<p>Fermata</p>



Action	What does success look like?	Timeframe	Category	Relevant Use Cases	Submitted by
7.3 Grant funding opportunities can be amended to provide "plus-up" funding for DER arrangements that optimize grid conditions.	Technologies like "buffer batteries" are eligible for state funding opportunities.	2021	7. Demonstration & technology support	All V1G use cases.	Energy Innovation
7.4 Full fixed cost connection  CPUC Comment: Is this calling for the IOUs to set a fixed cost for all aspects of connection across all EVSE connections, or to site a fixed cost upon initial site design that the IOUs must honor even if the costs differ during construction? Reply: fixed based on level of power supplied? would you proposed any other factor(s)?	New connection status and rate for EV installations to emphasize flexibility for market participation	2-5 years	7. Demonstration & technology support	All V2G use cases AND 1921, 1921.1, 1921.2, 1921.3, 1924, 1924.1, 1924.2, 1924.3, 1925, 1925.1, 1925.2, 1925.4, 1984, 1996, 2125, 2128, 2140, 2236, 2329, 2329.1, 2332, 2332.1, 2344, 2533, 2533.1, 2533.2, 2533.3, 2536, 2536.1, 2536.2, 2536.3, 2548.1, 2548.1, 2548.2, 2548.3	Nuvve
7.5 Pilots demonstrating connection capacity sharing  CPUC Comment: i.e. "load management" or "energy managements" to optimize electrical panel and/or building electrical supply? Reply: I think also developing minimum safety standards such as currently under development by CSA; potentially also market understanding/acceptance and performance standards..... Are there steps that could be taken sooner?	Local capacity exchange: Load limiting software and tech enables to lower the cost of connecting new generation to the network by sharing/trading existing capacity to defer reinforcement and to trade excess capacity across different timescales	2-5 years	7. Demonstration & technology support	All use cases	Nuvve
7.6 Create a mechanism which allows for quick approval of demonstrations for technology and to determine market interest  CPUC Comment: do you mean "create a program" like ETP?	Develop a regulatory framework which pre-establishes funding, prioritization and approval processes for IOU demo and tests (as the need arises) without the need to have go through a formal regulatory process to approve each proposed demo and test.	2-5 years	7. Demonstration & technology support	All screened and approved use cases should apply depending on real time need. However to prioritize use cases the following metrics can be used as guidelines.	SCE-SDG&E-PG&E

Action	What does success look like?	Timeframe	Category	Relevant Use Cases	Submitted by
<p>8.1 Avoid over-regulation of EVSE specifications</p> <p>CPUC Comment: you may want to clarify 1) whether this is an issue that more specifically impacts VGI capable EVSE (i.e. if you think that they tend to fall into the "small and new entrants" category) more than other EVSE; and 2) whether you want action for a) VGI-capable EVSE sepcifically (or through some policy tragets the "small and new entrants" vs or b) all EVSE?</p>	<p>Leave door open to small and new entrants to the EVSE indsutry in California</p>	2020	8. Interconnection & technical standards	All use cases	Nuvve
<p>8.2 Waive second interconnection of V2G</p> <p>CPUC Comment: you mean that interconnection should be based on EVSE rather than EV, based on what you recommend as your vision of success, right? If so, you may want to clarify the recommended action. Please also explain whether you are commenting on an existing policy; and/or new policy under development that you would like to be shaped in this way?</p>	<p>If a customer gets a new EV with qualified inverter and equal or lesser capacities, customer should remain with same interconnection</p>	2020	8. Interconnection & technical standards	All V2G use cases	Nuvve
<p>8.3 Finalize submetering protocols/standards</p> <p>CPUC Comment: maybe add "to encourage EV TOU rate uptake" - or do you mean that other services/revenue streams will be enabled as well?</p>	<p>Affordable sub-metering solution that allows customers to access favorable rates without significant infrastructure investments</p> <p>CPUC Comment: you mean TOU, including future planned dynamic TOU rates that encourage VGI right?</p>	2021	8. Interconnection & technical standards	School and transit buses, other fleet depots/warehouses, Customer Bill management application	MHDV Team
<p>8.4 Adopt interim procedres for validating current limiting functionalitie in smart charging</p> <p>CPUC Comment: Do you mean that you want interim procedures for interconnection of V2G capable systems with V2G turned off and only managed charging turned on? and then once V2G procedures are worked out, follow V2G procedures before turning on that capability? It seems that way from the rest of the info in other columns.I read the current ask as allowing smarth charging.</p>	<p>Route for V2G capable EVSEs to install without interconnection prior to PTO</p> <p>CPUC Comment: "with V2G turned off and V1G/managed charging enabled?" and PTO = Utility permit to operate, right? may want to clarify</p>	2021	8. Interconnection & technical standards	All V2G use cases	Nuvve

Action	What does success look like?	Timeframe	Category	Relevant Use Cases	Submitted by
<p>8.5 Interconnection of mobile inverters</p> <p>CPUC Comment: suggest “develop standards for interconnection of mobile inverters exporting AC power from vehicle and then update Rule 21”, based on the other information provided, if that is what you recommend Reply: I think that this is the same as ENEL X on row 74; overlaps w/ IOU recommendation</p>	<p>Technical and safety standards for interconnection agreed upon and testing regime standardized.</p>	2021	8. Interconnection & technical standards	All V2G use cases	Nuvve
<p>8.6 Pre-wiring and preliminary interconnection of V2G</p>	<p>Include EVs as other DER in consideration of proposals for pre-interconnection at the subdivision level/house level.</p>	2021	8. Interconnection & technical standards	All V2G use cases	Nuvve
<p>8.7 Enable V2G AC interconnection pathway</p> <p>CPUC Comment: I think this is the same as Nuvve recommendation on row 72; also overlaps with IOU row 75</p>	<p>Testing and certification regime for V2G AC systems adopted and incorporated into Rule 21; customer uptake; successful interconnection and PTO of V2G AC systems</p>	2-5 years	8. Interconnection & technical standards	Many applications -- chief among them Customer Backup Resiliency, Customer Bill Management, System / Local RA, Distribution Deferral	Enel X
<p>8.8 Coordinate the development of interconnection and technical standards with the VGIWG effort.</p> <p>CPUC Comment: overlaps with all of the interconnection recommendations on row 69, 70, 72, 74 - are there other aspects as well in the IOU recommendation that aren't covered in those other recommendations? Reply: can we better coordinate between, for instance the Rule 21 efforts, with this workgroup?</p>	<p>The development of a continued effort to develop VGI which includes also standards setting bodies or integrates complementary standards work into the VGI effort</p> <p>CPUC Comment: how would you suggest that we do this? extension of VGI WG? through a process to develop SB 676 guidance and track/support implementation?</p>	long term and future	8. Interconnection & technical standards	<p>All screened and approved use cases with:</p> <p>1) Type of VGI = "V2G" 2) Approach = "Direct"</p>	SCE-SDG&E-PG&E

Action	What does success look like?	Timeframe	Category	Relevant Use Cases	Submitted by
<p>9.1 Create public awareness and education programs and materials on V2G systems and how to get them. This could particularly be focused toward government fleets.</p> <p>CPUC Comment: Why on V2G systems specifically?</p>	<p>More general knowledge of V2G, lower customer acquisition costs</p>	<p>2020</p>	<p>9. Market education &amp; coordination</p>	<p>"Group A" or can be done today without any major changes to policy or markets and will have commercial products available in 2020 or 2021: 31, 34, 416, 419, 440, 443, 826, 827, 848, 850, 851, 7, 10, 19, 431, 839, 130, 539, 946, 947, 1028.</p> <p>Additional use cases "Group B" associated with these sectors could also be added but would need some action by utilities and/or policy change or market access. These include: 67, 70, 115, 118, 476, 479, 527, 884, 886, 887, 899, 932, 934, 935, 46, 142, 455, 575, 860, 862, 863, 872, 874, 875, 908, 958, 959, 970, 971, 972, 994, 995, 1088, 1316, 1436, 1640, 1700, 1748</p>	<p>Fermata</p>
<p>9.2 Fund market and education efforts to educate potential customers on the reduced cost of fueling EVs in comparison to ICE and short and long term benefits</p>	<p>The use of mass market and social media to provide EV fueling information to supplement EV marketing efforts from EV OEMS and EVSE manufacturers</p>	<p>2021</p>	<p>9. Market education &amp; coordination</p>	<p>All screened and approved use cases should apply depending on real time need. However to prioritize use cases the following metrics can be used as guidelines.</p> <p>Use cases which meet all of the following criteria:</p> <p>1) A population rating of 25,000-100,000 or greater</p>	<p>SCE-SDG&amp;E-PG&amp;E</p>

Action	What does success look like?	Timeframe	Category	Relevant Use Cases	Submitted by
<p>9.3 Establish a voluntary task-force to convene on regular basis to discuss technological barriers; submit semi-annual update reports to relevant CA state agencies (CPUC, CEC, CARB, and CAISO) every 6 months, including potential recommendations on consensus items. This technical task-force can potentially also address topics related to interoperability and communication pathways and protocols.</p>		2-5 years	9. Market education & coordination	Use-cases that did not pass screening because of Technology (total of 120 use-cases)	Karim Farhat
<p>9.4 Establish a voluntary task-force to convene on regular basis to discuss barriers related to retail market design; submit semi-annual update reports to relevant CA state agencies (CPUC, CEC, CARB, and CAISO) every 6 months, including potential recommendations on consensus items.</p>		2-5 years	9. Market education & coordination	Use-cases that did not pass screening because of barriers related to retail market design (total of 155 use-cases)	Karim Farhat
<p>9.5 Establish a voluntary task-force to convene on regular basis to discuss barriers related to wholesale market design; submit semi-annual update reports to relevant CA state agencies (CPUC, CEC, CARB, and CAISO) every 6 months, including potential recommendations on consensus items.</p>		2-5 years	9. Market education & coordination	Use-cases that did not pass screening because of barriers related to wholesale market design (total of 95 use-cases)	Karim Farhat
<p>9.6 Establish a voluntary task-force to convene on regular basis to discuss barriers impacting customer adoption and participation; submit semi-annual update reports to relevant CA state agencies (CPUC, CEC, CARB, and CAISO) every 6 months, including potential recommendations on consensus items.</p> <p>CPUC Comment: do you have an opinion on whether there should be one umbrella task force with separate tracks? or four separate task forces?</p>		2-5 years	9. Market education & coordination	Use-cases that did not pass screening because of barriers to customer adoption and participation (total of 515 use-cases)	Karim Farhat

Action	What does success look like?	Timeframe	Category	Relevant Use Cases	Submitted by
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	Majority of EV owners are aware of VGI programs and activities that could benefit them	2-5 years	9. Market education & coordination	All use cases	VGI Council