

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking to Consider
Alternative-Fueled Vehicle Programs, Tariffs, and
Policies.

Rulemaking 13-11-007
(Filed November 14, 2013)

**OPENING COMMENTS OF
NRG ENERGY, INC. ON
ORDER INSTITUTING RULEMAKING**

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I. INTRODUCTION.

Pursuant to the Order Instituting Rulemaking issued on November 22, 2013 (“OIR”), NRG Energy, Inc. (“NRG”) provides the following comments on electric vehicle charging issues, vehicle-grid integration (“VGI”), and vehicle-to-grid (“V2G”), a form of VGI that backfeeds power from the plug-in electric vehicle. NRG is a diversified energy company which is actively working on vehicle-grid integration projects around the country and deploying electric vehicle (“EV”) infrastructure in California.

While these comments address many of the specific issues identified in the OIR, the basic principles informing these comments are:

1) The market for EV services overall and VGI services specifically will be most successful through the speed, innovation, and customer focus delivered by the competitive market. Ratepayer investments by the utility should remain focused on distribution and metering as well as the processes that enable the market to provide value to the distribution system.

2) Submeter billing capabilities, protocols, and technology are critical to unlocking more value within existing EV services, as well as releasing the value on VGI Services. The Commission should ensure that submetering work moves forward in relation to these efforts.

II. SUBMETERING AND ALLOCATION OF DISTRIBUTION UPGRADE COST.

For V2G applications, sub-metering rules should include provision for two-way power flow. Any rules adopted by the Commission should not preclude sub-second response and communication times in the sub-metering systems.

As effectively expressed in the OIR and White Paper, alternative-fueled vehicles (“AFVs”) can impact the distribution system with both costs and benefits. For instance, V2G can reduce peaks at facilities where multiple EVs are parked, thus easing the peak’s impact on the distribution system. Consideration of both costs and benefits provides a helpful perspective when assessing cost allocation of distribution system upgrades.

III. VEHICLE-GRID INTEGRATION.

NRG supports V2G and identifies the following basic principles the Commission should consider when addressing V2G policies:

1) V2G is valuable, has a mandate from the governor, and has attracted commercial interest from OEMs: work on V2G should proceed immediately, rather than waiting until an OEM announces a commercial V2G car;

2) VGI is simply a form of demand response (“DR”); therefore, to encourage the deployment of VGI, the Commission should, where possible, rely on rules applicable to DR generally, rather than adopt VGI-specific regulations;

3) to facilitate VGI, the Commission should (a) focus on implementing Rule 24, (b) support additional CAISO products (e.g. Regulation) as components of the ISO Proxy Demand Response product, as well as making Proxy Demand Response compatible with backfeeding, (c) clarify rules related to fast-track interconnection and net energy metering (“NEM”) for energy storage (including V2G), and (d) enable provision of value to the distribution system by way of third party aggregators.

VGI is principally a form of (potentially bi-directional) DR—that is, the primary function of the resource is not to provide grid services. NRG supports an interaction with the vehicle

owner that involves as little ongoing regulatory intervention as possible and allows for as much continuous innovation as possible. Participation in any primary role by utilities, with their status as regulated monopolies and consequent low cost of capital, would be unfair for third-party competition.

NRG fully supports the vision in the Governor’s ZEV Action Plan to “consider what the grid will look like in ten years if one million ZEVs are on the road.” We agree with the initial evaluation presented in the white paper, namely that this scenario represents many gigawatts of additional load, which is likely to require substantial upgrades to the distribution system. VGI, and especially V2G, represent a tremendous opportunity to turn this cost into a net benefit by providing an array of services at the transmission and distribution level. NRG also agrees with the white paper in concluding that, at current EV penetrations, there are not now any “substantial improvements” required. NRG underscores that this proceeding is confronted with balancing its focus on opportunities that are not yet apparent (e.g., mitigating distribution system impacts from high EV penetration) with opportunities that are accessible today (e.g., demand charge reduction, or satisfaction of Local Capacity Requirements).

The intention of the ZEV Action Plan to “[m]aximize potential for ancillary services provided by PEV batteries...”, “... commercialize vehicle to grid (V2G) services provided by PEV batteries,” and “[d]emonstrate vehicle to grid and smart charging capabilities for medium-duty and heavy-duty PEV fleets” must maintain a prominent position in this proceeding. As pointed out in the white paper, V2G has the potential to provide many times more value than VIG, since it has unlimited duration in provision of certain services and provides twice the power capacity. Not only can this value significantly lower the cost of ownership of a PEV, but it can also provide the energy storage function so critical to integration of high levels of variable renewables. V2G is too valuable an opportunity to be deprioritized, even in light of technical challenges.

It is important to emphasize the progress that has already been made: NRG’s subsidiary, NRG eV2g LLC has been operating an aggregate of bidirectional vehicles providing V2G services under non-pilot rules in an ISO demand response program for compensation of about \$120 per vehicle per month. Moreover, Honda has recently announced a partnership with NRG

eV2g to provide “a potentially valuable energy storage resource to the nation's electrical grid.” Honda has said that they “envision using [the technology to send power in two directions] in electric vehicles offered for sale,” thereby “providing for more cost-effective ownership of plug-in electric vehicles.”

The OIR is correct to identify the need to coordinate with other proceedings. In addition to those proceedings identified in the OIR for coordination, the Commission should also coordinate with R.11-09-011 addressing distribution level interconnection rules.

NRG does not believe PEVs are unique because they “primarily use their storage functionality for transportation.” In fact, it is a fundamental feature of DR that the resource is primarily used for something other than providing grid services. NRG has found that all of the same market, registration, and settlement rules that apply to DR resources can apply seamlessly to V2G resources. That said, the physical interconnection in certain circumstances can be unique for V2G, since the inverter may be onboard the vehicle.

NRG encourages the Commission to implement additional pilot projects to explore the possibilities presented by VGI.

The following provides responses to questions raised in the OIR with respect to VGI.

1. Is the VGI framework proposed in the White Paper a reasonable way to organize VGI activities and scenarios?

Response: Yes, the framework is a good way to organize the various elements of the VGI topic.

In addition, third-party aggregators can independently address both the question of fragmented actors and the question of prioritizing among (or primacy of) competing opportunities at the grid, distribution, and facility level. NRG would be happy to demonstrate the functionality we have built to that end in a pilot project.

2. Do you agree with Energy Division’s prioritization of the VGI scenarios?

Response: Yes. The proposed prioritization allows for quick wins on easier items and more process/technology development time on more difficult items. However, the Commission should

ensure that actions and decisions on early items do not disadvantage or eliminate possibilities on later items.

That said, the Commission should change the language for consideration of V2G as a viable option to reflect the substantial commitment any automaker must make in a new design for a vehicle. Despite the fact that several automakers, albeit small-volume ones, have already indicated availability of commercial V2G products, the Commission should modify the following language, “Wait to develop rules until automakers indicate when commercial technologies will be available,” to instead read, “Establish rules that ensure a stable market to attract automaker investment. Prioritization should be increased when automakers demonstrate investment consistent with a substantial interest in providing a commercial product”.

3. Does the White Paper capture all the utility regulatory barriers to VGI?

Response: Generally, the White Paper captures such barriers with a few possible clarifications required in the area of sub-metering.

The product offerings and market size for VGI (both V1G and V2G) would be enhanced with second customer-of-record (COR) sub-metering. This approach allows for a simple and effective means to package the operational and financial complexities of the utility and/or ISO programs into an understandable value proposition to a consumer or business.

For V2G applications, sub-metering rules should include provision for two-way powerflow. More specifically, the Commission should apply NEM within sub-metering to avoid unintended financial consequences of providing V2G services such as regulation, ramping, or distribution system support. Submetering rules should also not preclude the option for sub-second response and communication times that are required for certain V2G services.

With respect to the four key regulatory issues in the White Paper: 1. The identification of the resource should be consistent with CAISO demand response frameworks; 2. The definition of who can aggregate should not be part of this proceeding, but instead of the proceedings addressing the relevant market service (e.g., DR, flexible capacity, etc.); 3. Third-parties are best positioned to solve the question of primacy of applications; and 4. It is essential that utilities

cooperate in opening opportunities to provide value on the distribution system that are coordinated through third-parties.

4. How should we address any safety and reliability concerns associated with VGI?

Response: Following market-based approaches to safety and reliability that are similar to the commercial solar industry will provide the strongest value. To that end, IEEE 1547 is a well-proven international standard that thoroughly addresses safety requirements for interconnection.

IV. AFV RATE DESIGN POLICY.

NRG welcomes new rates that both better reflect actual costs and provide lower charging costs to plug-in EV (“PEV”) owners. In fact, creative rate structures have been an integral part of the eVgo¹ residential subscription model, which encourages off-peak charging with financial incentives. eVgo also provides green energy supply options to customers. NRG believes third-party networks such as eVgo are well positioned to be responsive to consumer behavior in a way that can both best provide such incentives as well as address customer desire for greener products.

For workplace and commercial charging, demand charges already provide an incentive to coordinate different needs to minimize facility peaks. NRG eV2g technology enables that coordination in a way that provides the range when needed, without sacrificing the primary purpose of the vehicle, and with the potential to provide incentives to drivers for participating. Depending on the number of vehicles at a particular site, this functionality can have more flexibility with bidirectional power flows—for instance, a vehicle that must charge at very high power as quickly as possible can be offset by a vehicle that will be parked for a very long time, as the latter can back-feed power without negatively impact its driving schedule.

The following provides responses to questions raised in the OIR with respect to AFV Rate Design Policy.

¹ eVgo is the NRG subsidiary that provides EV charging services in California.

1. What is the utility experience to date regarding customer election to use PEV-specific tariffs?

Response: While NRG is not a utility, our anecdotal experience suggests that the consumer cost of accessing PEV-specific rates exceeds the benefits of those rates. This experience is consistent with utility comments at the December 4 VGI and Financing Workshop. This cost comes in the time and money to install a parallel metered service for the PEV rate. Since this cost exceeds the perceived benefit, customers choose the whole-house rate or to stay on the existing rate.

The sub-metering protocol work is a potential tool for addressing this cost challenge. If the protocol can allow for subtractive sub-metered rates, this can lower the consumer installation cost and time of accessing the rate. Furthermore, if the protocol can leverage the existing smart grid infrastructure and back-office utility resources, this can further lower the communications and systems costs of implementation. Finally, the installation and equipment costs to the consumer may be further reduced if there is an option for the EV service equipment (“EVSE”), itself, to be the meter as a certificated smart energy device.

2. What issues need to be considered when designing PEV rates for residential charging?

Response: Generally, NRG welcomes new rates that incent EV ownership, motivate grid-friendly charging, and reflect true cost-of-service.

As mentioned above, the residential customer’s cost of implementing segregated metering must be affordable.

Also, the rate must be economically sustainable. In other words, the rate must reflect true cost of service and transparently include any value that enables the chosen application to have a specifically advantaged rate. If the application-specific rate is enabled simply by cross-subsidization, the rate may not be sustainable. If the rate is not sustainable, the long-term investments made in vehicles and infrastructure will not achieve their required returns.

3. Should the Commission consider new rate tariffs for workplaces providing PEV charging?

Response: Given the rapid adoption of workplace charging at very employee-friendly rates, there is no clear evidence that new rates are required. However, if the Commission seeks strong

VGI integration of these vehicles, such a rate could be valuable to influence or command the charging behavior.

By contrast, multi-family residential communities have seen much slower adoption of PEV charging. One factor contributing to this slower rate is the risk of incremental demand charges on the host. We believe this issue could be addressed with a commercial rate for common-area residential parking similar to the residential rate that is otherwise accessible by home-owners. Enabling this rate for sub-meter and second customer-of-record (COR) would decrease installation costs and accelerate penetration through the use of service providers.

4. How can residential and workplace PEV rates incentivize smart charging and allowed controlled charging?

Response: Given the installation and equipment cost for smart charging, the customer will require access to a special program to encourage investment and participation. Assuming subtractive sub-metering with EVSE-embedded meters with smart charging, we believe incremental installation and equipment cost of this solution can be very competitive.

Furthermore, clarification that NEM applies to behind-the-meter energy storage devices (including V2G resources) is needed to avoid unintended financial penalties for providing services such as regulation, ramping, or distribution system support. Otherwise, NRG views much of the customer value for providing smart V2G and VGI services as coming from outside of rate structures, by way of, for example, DR structures that provide access to CAISO markets and capacity payments.

5. How should the Commission address demand charges for medium- and heavy-duty plug-in electric vehicles?

Response: The Commission should avoid application-specific rates that are simple rate-payer cross subsidization without an underlying economic basis. Pursuing this alternative can stifle market innovations in alternatives that are economically viable (e.g. distributed generation, storage).

V2G revenue has the potential to substantially offset demand charges for medium- and heavy-duty plug-in electric vehicles, such as the V2G school buses under development by TransPower.

V. FINANCING.

The following provides a response to the question raised in the OIR with respect to Financing.

1. Should the Commission direct utilities to provide financing to customer to encourage PEV adoption?

Response: The utility should maintain its focus on investing ratepayer capital in power distribution facilities that benefit the ratebase as a whole. The utility should not utilize its cost-of-capital advantage provided by ratepayers to compete with consumer and corporate lending organizations in financing investments on the customer side of the meter. Furthermore, ownership of charging facilities by utilities is contrary to prior Commission rulings intended to foster innovation and optimal customer service in a competitive third-party market for charging services.

VI. GENERAL.

The following provides a response to the question raised in the OIR with respect to the General topic.

1. What changes to the Commission's Rules or new Rules are needed to facilitate the goals outlined in this OIR?

Response: In addition to understanding the VGI opportunity better, there are several barriers to enabling a V2G market that are currently being addressed in other proceedings. It is important to acknowledge these barriers, and NRG supports efforts to use the present proceeding to assist the parties in participating in those proceedings. Actions to overcome these barriers include:

- Clarify that fast-track interconnection and NEM are not precluded for V2G.

- Implementation of Rule 24 to enable widespread customer participation in CAISO markets.
- Enable provision of VGI value to distribution systems.
- Support access to additional CAISO products by DR.
- Support CAISO DR products to include two-way power flow.

VII. CONCLUSION.

NRG looks forward to working with the Commission in this rulemaking to advance the State's goals for deployment of zero-emission vehicles and realizing the ancillary benefits such vehicles can provide.

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Respectfully submitted,

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