Good morning. Siemens is pleased to participate in this technical conference, having been one of the signatories on the petition that was submitted to the Commission to commence an EV proceeding. We see transportation electrification as a pivotal trend much like what happened to telecom and one that offers tremendous benefits to EV owners, ratepayers, and society as a whole. Siemens is providing workplace charging to our employees and working on electrifying our own global fleets. In fact, we were the first corporation of our size to commit to zero net carbon emissions, in our case by 2030.

Siemens offering in TE encompasses what we refer to as the plug to the grid hardware and software ecosystem – and includes light, medium, heavy-duty vehicles as well as off road solutions. The goal of our policy efforts is to promote policies and global best practices that drive market growth and consumer adoption of EVs. I’ll focus on two of the key policy tools that are needed for EVs to act as DERs, which are smart charging and open technical and payment standards.

We believe the most important factor in adoption is lowering the Total Cost of Ownership, in terms of both economics and consumer convenience. One means of reducing costs is having access to low-cost, off-peak electricity – which includes times when renewable resources are abundant. Another is leveraging EVs as grid assets, as DERs.

One way to do this is what we call “V1G”. This means managing charging so it happens off peak, and, by that, we mean both the overall system peak as well as the local distribution peak. In addition to this regular off-peak charging, V1G includes the ability to turn off chargers for demand response events that typically occur 50 to 100 hours per year when the system or local grid experience especially high peak loads. At the system level, V1G can lower capacity costs and wholesale energy costs at peak. For the grid, V1G can reduce or avoid the need to reinforce the grid to support EV charging.

Another DER approach is V2G, which means using the EV’s battery to send power back onto the grid for demand response or to provide ancillary services to the wholesale market.

To make V1G and V2G work, we need both the right financial incentives and smart charging technology. Time-varying prices and demand response payments are obvious, with time-of-use rates being a good start but day-ahead hourly prices being even better. The problem with time-
varying rates is that EV drivers are usually happy with those rates for their vehicles but often don’t want those for their home or business. EV-only rates are a good solution and offered by a number of utilities. Which brings us to smart chargers.

Smart chargers are defined by three key features that empower EVs to be DERs. First, they have sub-meters built into them. EV-only rates can be done by adding a second utility meter, which can be expensive as we heard yesterday, or using a billing-accurate sub-meter. This is being done in SDG&É’s Power Your Drive program, which has an EV-only, day ahead hourly price option. SDG&É put us and other EVSE providers through the ringer to qualify our equipment, but the result is a much more cost-effective solution.

The second defining feature of smart chargers is that they are networked. This means they have communications capability to receive price signals and control commands, as well as to send consumption data back to consumers. EV owners can program their chargers to turn on only when prices are low or to turn off when demand response events are called.

The third feature is IT, the integration of EVSE with back-end systems. For EVs to be effective as grid assets, as DERs, they need to interconnect with various parties. They need to connect to some combination of utilities for billing and other uses, EVSPs for charging management, ESPs and aggregators for DR programs, customers for accessing data and controlling their own chargers, and, in the case of V2G, to EVs themselves.

This brings us to open standards. Proprietary standards with closed networks have been a barrier to more widespread use of EVs generally and as DERs. Proprietary standards have also resulted in stranded assets in some cases.

I'll highlight four technical standards – before your eyes glaze over, remember how the Internet did not take off until TCP/IP and HTTP were adopted. For EVs, the first standard is for communications from the cloud to the charger to manage the charger and charging activity; most of the industry has gone with Open ChargePoint Protocol for this. The second is for communications from wholesale market operators or utilities for demand response events. The industry is converging on OpenADR for this. The third is for communications between different public network operators so that EV owners can belong to Network A, charge on Network B, and get a single bill from the one to which they have subscribed. This is important for consumer convenience and EV adoption. The emerging standard here is the Open ChargePoint Interconnect protocol, OCPI. The fourth is for communications between the charger and the EV
itself. The standard used for this is one Siemens helped develop and has been adopted globally. It is called 15118.

Our advice to policymakers is not to mandate specific standards. Instead, we advocate for regulators to require that any publicly-funded charging infrastructure comply with open standards, but that the specific equipment standards be specified by the relevant organization at the time of procuring equipment. This could be utilities, including those offering rebates for chargers, or public agencies giving out grants.

While I’m talking standards, I’ll also highlight the importance of open payment standards. EV owners face huge barriers in utilizing public charging networks, because each network requires its own RFID card or key fob. Many also require subscriptions. The lack of charging infrastructure, including easily accessible public charging, was cited by 85% of consumers in a recent survey as a reason they did not purchase an EV. This was even higher than the 83% who said a main barrier was the cost of the vehicle itself. Some states have recognized this problem and are requiring open payment standards, such as credit cards. Let me stress that this is for public locations only. Massachusetts, Nevada, and California have already adopted this in some cases or are considering it.

EVs provide critical benefits as DERs to the markets and to the grid, which translates into lower costs for both EV drivers and other ratepayers. At the same time, a number of technical requirements need to be met to enable this functionality and create these benefits. Therefore, our position is that any publicly-funded EV chargers should be smart and should comply with open technical and payment standards.