November 14, 2017 San Francisco NOTES

Summary
- Attendance: approximately 27 attendees via Webex
- Notes available online: http://www.cpuc.ca.gov/vgi/
- Agencies appreciated parties' specificity in comments and answered clarifying questions.

Action Items & Next Steps
- The next full Working Group meeting is a Webex on 12/1 8:30-11:30 AM.
- December 18 meeting in-person meeting in San Francisco
- Deliverables 2 & 3 will be addressed in the CEC's IEPR and future implementation of the VGI Roadmap and through informal ARB processes.
- Agencies should clarify presentation re: specific terminology and application of recommendations in parts of EVSE prior to posting.

Resources

- Email the state agencies (CPUC, CEC, ARB, CAISO, GO-Biz) with any questions or comments: vgiworkinggroup@cpuc.ca.gov

Detailed Comments

Applicable segments of PUC/ARB hardware proposal

- Carrie Sisto:
  - Agencies still need to determine whether the proposal will apply to residential facilities and lower power DC charging.

Use of multiple protocols

- Mike Bourton:
  - What protocols fully meet requirements? Why are we throwing away 6 months of effort? Decision to do this was made without final report.
    - Jennifer Kalafut: This WG is not a waste of time. The work has been very useful already and will be included in the final result, which will be reviewed by Commission.
    - Justin Regnier: Given multiple pathways, how to ensure that the market can function by letting implementation scale with minimal risk? Hardware specifications would allow that universal design and avoid stranded assets. Some solutions are unpredictable, but we can be certain that implementation can be repurposed. Want to avoid erecting artificial barriers that predispose the market.
    - MB: SEP 2 enables all pathways. This exercise has not examined cost. Hardware costs are not significant barriers to implementation (rather, cybersecurity and softcosts). Wants SEP 2 accepted.
    - JK: will take this into consideration
    - JR: There are other pathways

Metering

- Peter Klauer:
  - Metering for DR and other products have had difficulty in satisfying requirements for revenue quality metering. ISO is simplifying the process. Must be LRA approved for quality, security, and accuracy. Will compare the technological options to the capabilities needed for different service operators.
  - Josh McDonald: Use Handbook 44 accuracy, which is not exactly "utility revenue grade."
  - Jeremy Whaling: Agree with Josh
    - Options are metering at the home level or EV-specific metering.
    - Questions how to use the whole-house metering since house load can wipe out EV DR.
    - CISR form is a barrier. Keys to the kingdom. The automaker doesn't even need the W-H data – simply needs to send back to the utility and the CAISO.
    - EVSE-submetering if low cost
    - Vehicle data doesn't meet the utility requirement.
- Mike Bourton:
  - Add SEP & OCPP as a Northbound protocol, and separate northbound requirements into physical layer and protocols

Will specific protocols be referenced or not?

- Josh McDonald:
  - Proposal doesn't have application protocols, but now we are taking about application layer protocols.
    - Noel: Clarification: we are assessing comments that were asking for application layer protocols.

Which part needs to communicate?

- Jeremy Whaling:
  - Comment about daisy chaining?
    - Need to be specific about what is talked about: communications vs metering.
  - Josh Mcdonald: Aggregation or local BMS communication in ChargeReady RFP.
    - Gateway
    - Different EVSP vendors will have different architectures.
    - IPv6 as minimum – depending on the deployment.
  - Keerthi Shankar:
    - One connection per site. EVSEs communicate to gateway to internet.
    - Previously: $20/mo-spot for cellular.
  - Stephan Voit:
    - Mike Bourton is partially correct.
    - ISO 15118 capable of authentication, charging, communicating with an EVSP, charging according to constraints and power production requirements.
    - Via international standardization, car manufacturers are already requesting 15118 and OCPP. Suggests more functionality greater than IEEE 2030.5.

- Dean Taylor:
    - IPv6 for low cost and flexibility
    - Chargers are sent to central control
    - Concerned about standards, so what are the ways to reduce cost?
    - Sent letter on IEPR- large scale demonstrations.
        - Jennifer Kalafut: Keep in mind, this process is intended to set a minimum set of equipment standards for adaptability to enable VGI to greatest extent. Part of the futureproofing is saving ratepayers future costs.
            - Kelsey Johnson: Provide a specific rationale as why DC is not being discussed. From a communications/hardware side why?
                - Justin Regnier:
                    - Group understands Nuuve's use case is not synonymous with Fast Charging (10-50 kW DC)
                    - Full value: V1G
                - Noel Crisostomo:
                    - Will consider DC given Chargepoint's comment at call and product with Vivint.
                - Mike Bourton:
                    - Don't build a Cadillac. Be specific with a requirement.
                - KJ: What is the widget that would allow for V2G upgradability?
- Adam Langton:
    - Telematics can be used on any vehicles, but no VGI programs are possible without value.
    - Steve Davis:
        - BMW can do a lot with telematics, but the point of regulation is equipment.
        - A minimum standard would let the automakers point to it. What we have done is to replicate our disagreement that preceded this working group, during this process. The statement to not reference a standard southbound is troubling to the automakers. Failure if not able to make a decision. Never will be able to achieve agreement. Trenchant opinions. Get over this to enable production plans. Goes beyond grid integration, but to customer simplicity.
    - Justin Regnier: not holding out with technical – open to feedback.
    - Gadi Lenz:
        - IoTecha makes modules that support multiple protocols: 15118 + OCPP with physical connectivity options to enable futureproofing cost effectively.
        - Metering options with integrated modules.
        - 15118 certificates and authentication over TLS. Doable and working today.
        - OCPP + TCP implemented with central systems- all IP based.

Meter Accuracy

- Harry Haas (Siemens):
    - Captured telecom daisy-chain comment correctly.
    - We do not have 15118, but they are working on it and will have soon - supports.
    - Has revenue-accurate metering. Recommends use of accuracy portion of HB 44 (do not implement it in whole).

- Complies with ANSI C-12. HB 44 is not as stringent would be acceptable. Cost of adding a meter would be incremental for higher accuracy.
        - Embedded circuitry-based meter. Not a great incremental cost. Only offer a metering with a smart charger – as a package deal. An additional physical meter along-side a charging station is expensive because it is not designed within. Not problematic if it is pre-designed inside the EVSE.
        - Depending on the requirement of installation, as is with some programs, the cost to add a meter afterward requires a great effort.
    - Processes to add the traceability for the product is high compared to the incremental metering. Controllable by setting requirements for a particular program.
        - Incremental cost to add traceability in line with $100, rather than $10.
    - Differentiate revenue ACCURACY vs. revenue GRADE
        - Mike Bourton: The revenue grade definition implies traceability and certification. What is meant-- accuracy or other things?
        - Peter Klauer:
            - Any resource requires auditability, data retention. Consideration of ANSI C-12, but relaxing CAISO metering requirements would allow for options that are suitable for distribution level services for performance and settlement.
            - Open for discussion regarding:
                1. Are the meters of sufficient quality to meet a settlement level need?
                2. Submeter a portion of a facility, a series of devices below. E.g. the CPUC's Submetering Protocol.
            - Minimum requirements that aren't a utility meter, but are accurate.
    - Carrie Sisto: for EV only rates, the utilities are proposing to install separate meters.
    - Josh McDonald:
        - Public and multi-user EVSEwill pertain to HB44 accuracy due to the DMS requirement.
        - It is helpful for collecting data. Not for billing.
            - In ChargeReady, Level 1s don't require meters, Level 2s do.
        - SCE's metering requirement for its telematics pilot is GreenButton ConnectMyData to Whole House meter, using meters onboard the vehicles to collect baseline data. Vehicle charging data is not very accurate.
        - Calculating customers' response via a 10 in 10 baseline. Applying TOU EV-1.
    - Dean Taylor:
        - Minimum of IPv6?
            - Mike Bourton: Chademo doesn't use have a IPv6 - CANBUS

Cybersecurity

- Gadi Lenz:
    - Cybersecurity based on communications channel, authentication, session keys.
    - Don't know whether EVSE should have hardened processors and memory.
- Stephan Voit:

- o Smart meters back-end cybersecurity. Processors – EVSE in the public (outside), to ensure that anyone. Read certificates using TLS secure communication. Could be done with Hardware security module. Offering services about cybersecurity, random #s, "crack audits." Smart cards (SIM) to enable security modules. TPMs used in desktop computer for secure environments. With special hardware.
  - o Started for German smart meters. Smart gateway requires certificate.
  - o How secure do you want it? Higher levels will be more secure. There should be an analysis of cybersecurity like penetration tests.
- Jeremy Whaling
  - o Suggests bringing onboard a cybersecurity firm – depends on implementation.
  - o Cellular connections via bridge. By not implementing basic security requirements, could take control of the device, even with encryption.
- Abigail Tinker
  - o Weren't able to get to a determination given PG&E resources, support additional work.
- Mike Bourton
  - o Not the interfaces, but decoding. NIST Smart Grid – third party public device. Can protect data if opening data. Secure processor and memory.
  - o UL 2900 is used for medical devices, mandated by HIPPA.
    - ▪ SDG&E and PG&E penetration testing: 100-200k$.
    - ▪ UL 2900: $50k.
- Stephan Voit
  - o Opening a protocol securely 15118-2 allows for encryption and signatures are used across protocols and ensure that data is not manipulated.
  - o Cybersecurity is a process, but all of the processes are secure. All EVSE operators should analyze their systems.

EVSE to EV communications

- Jeremy Whaling
  - o PWM J1772 and HomePlug GreenPHY. 2/3 of the proposed pathway.
  - o 15118, SEP, telematics
- Gadi Lenz
  - o ISO 15118 is a full stack implementation. GreenPHY is the physical layer.
  - o There's no contention that ISO 15118 is the local layer most of the time
- Mike Bourton:
  - o Physical layer is not contended, only layer 7 (in the OSI stack) e.g. SEP vs ISO
- Hank McGlynn
  - o People keep dismissing SEP 2, but it is the only protocol that transfers Rule 21 functions into vehicle. In the future 15118 will include DER capabilities.

Value of grid services

- Bjorn Christensen
  - o CHAdeMO for DC because implementing commercial Enel/Nissan
  - o Value of V2G is higher than V1G
  - o Consider CDM for LEAF & Outlander implementation

- o Will reduce costs over time, cars/chargers need to be capable. DC chargers & V2G AC onboard bidirectional inverter provide 1300 Euro/EV-yr
    - Mike Bourton
        - Consider a duck curve for a EV adoption.
        - We won't have a value but for a valuable grid. Feeder trips.
    - Peter Klauer:
        - The goal here is to simplify the technology framework to enable revenue and reduce the costs and regulatory framework burdens.
        - Furthermore the ISO is not the only game in town.
    - Stephan Voit
        - Concerned about CHAdeMo, which has no definition for AC
        - Fast charging means charge now, where no grid support is available.
        - Pricing from UDel - $5-6k/year. As more cars are available, the prices reduce, but EVs could price mitigate RE integration
- Dean Taylor
    - o Closely monitor and track costs

Upgradeability

- Mike:
    - o Differentiation between consumer market- user installable.
    - o Don't require something so fancy.
    - o The use of the EVSE as a bridge does not need a truck roll.
        - Josh Mcdonald:
            - Concerns with something that can plug in. Who handles the problems with the module add-ons?
            - Wants remote upgradeability, sufficient memory, HPGP, IPV6
        - Gadi Lenz:
            - Agree against truck roll. Iotecha's hardware module is commercial:
            - Chip that does processor with HPGP, protocol stack embedded in the module.
            - Multiple ways to support an outside connection.
            - Over-the air firmare upgrades already viable, secure, and reliably
        - Harry Haas (Siemens)
            - Consumer electronics are relying on OTA updates. Automatically done. Chargers will have 2 processors.
            - Agree with challenges but chargers are increasingly reliable.
            - Module is securely plugged into NEMA4 enclosure.
            - Proposal supports major technology modularity, but you could have a charger that changes to upgrade to new technology.
            - CTA 2045 for plant Demand Response. CEAssn
        - Lisa McGee:
            - Maintenance for repair? Warranty requirements.

o Noel Crisostomo: Clarification, this proposal does not address warranty

- Mike Bourton:
  - Put a converter box to control the EVSE remotely.
    - o Pilot and ground for HPGP. Expand the length of the pins to another controller. Wired or wireless radio.

Moving forward with the Working Group

- o Dean Taylor
  - Wants to have a policy discussion on 12/18
  - Suggests continuing Deliverable 2 study next year.
  - Want to roll up sleeves on value and data.
- o Jeremy Whaling
  - Need to study value
  - Hard to get proprietary costs, but that's OK
- o Abigail Tinker
  - Don't pursue EVs as a silo. Would we want to disadvantage another resource to enable EVs to compete? Recommends coordination among proceedings.

Participants

- In Person: Mike Bourton, Jeremy Whaling, Quong Pham, Liam Weaver, Francesca Wahl, Keerthi Shankar, Jim Tarchinski, Jamie Hall, Dean Taylor, Joshua McDonald, George Bellino, Adam Langton, Abigail Tinker, Byorn Christensen, Kelsey Johnson, Chris Parkes, Jessica Allison, Rajan Mutialu
- Remote: Stephan Voit , Tyson Eckerle, Robert Uyeki, Mike Ferry, Matt Fung, Lance Atkins, Mahdi Ghamkari, Kiel Pratt, Kevin Schnepp, Jordan Smith SCE, John Mengwasser, Hugh McDermott, Harry Haas, Hannon Rasool, Hank McGlynn, Elise Keddie, David McCreadie, Bill Boyce, Steve Davis, Clay Collier, Gadi Lenz, Lisa McGhee, Rey Gonzales, Rich Scholar, Brian Chen , Alec Brooks, David Goldgraben
- Agencies: Peter Klauer, Stephanie Palmer, Noel Crisostomo, Justin Regnier, Carrie Sisto, Jennifer Kalafut