DOCKETED	
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V2G Interconnection Rules

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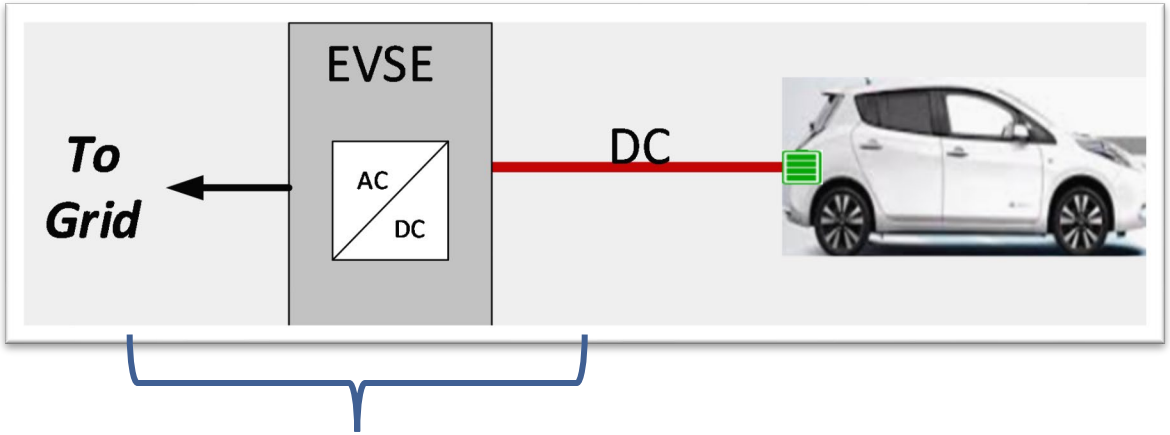
Agenda

- Welcome
- V2G-DC Approved Interconnection Rules
- V2G-AC Approved Interconnection Rules
- Q&A

V2G-DC Ready & Enabled For Bi-Directional Operation

Scenario: *Customer purchases a V2G-DC Systems (EVSE +EV) and the EVSE is factory programmed for Bi-directional Operation (Customer does not want to program the EVSE for V1G operation while the processing Interconnection Request)*

- *Customer must submit an Interconnection Request to support the required operation (non-export, NEM paired storage, etc.)*
- *Customer must receive PTO prior to connecting the system in parallel with the grid*



Minimum Interconnection Certification Requirements (Note 1)

For up to March 31, 2023 (note 2) (Note 3)

a) UL1741+ SA (including all optional tests)
b) Phase 2 communications via compatibility testing (E5000/E5036)
c) Attestations for Smart Inverter Function 1 compliance (Monitor Key Data) and Function 8(Scheduling)– E5000/E5036

Commencing April 1, 2023 (note 2) (Note 3)

a) UL1741 + SB (using IEEE1547-2018)

Note 1: Other requirements may be necessary depending on the method of operation (such non-export)
Note 2: Assuming Commission Approves Transition Advice Letter.
Note 3: Can use either of the requirements from September 1, 2022, to March 31, 2023: is approved by Commission

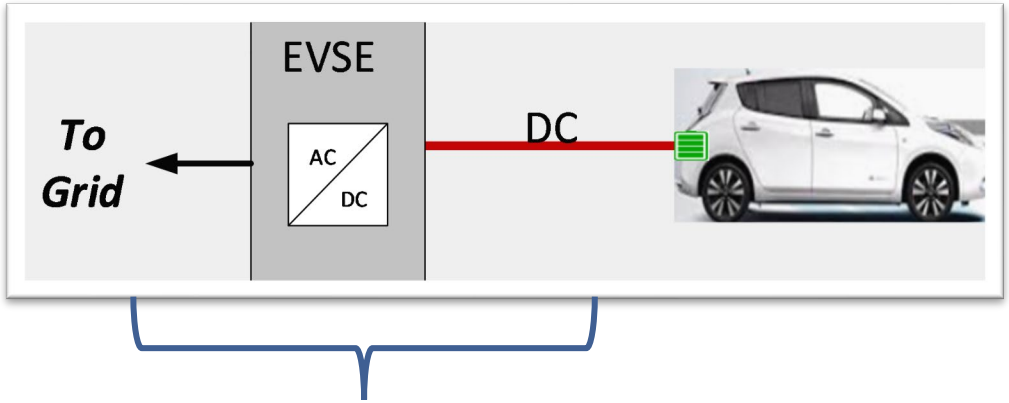
From PUC Decision: D.20-09-035

OP 39: Proposal 23c is adopted. Vehicle to Grid Electric Vehicle Supply Equipment with stationary inverter for direct current charging of vehicles (V2G DC EVSE) may be interconnected under the current Rule 21 language if the EVSE meets Rule 21 requirements, including UL 1741 SA and other updated smart inverter standards.

V2G-DC Capable But Not Enabled as Bi-Directional Operation

Scenario: *Customer purchases a V2G-DC System (EVSE +EV) and the EVSE is factory programmed for V1G Operation (Customer does not want to request Interconnection at this time)*

- *Customer can purchase a V2G-DC capable systems (EVSE+EV) and operate it as V1G*
- ***While not monitored****, V2G-DC capable systems that are operated as V1G must meet the applicable certification requirements (see previous slide), the EVSE must be factory set to V1G operation supported by UL PCS certification, the EVSE operation cannot be changed to V2G without first receiving Permission To Operate (PTO) from the utility.*



Customers may request Permission to switch to bi-directional mode

- Must complete and submit Rule 21 interconnection
- Must receive Permission To Operate (PTO) for bi-directional operation from the utility
- Only Manufacturer or approved third party installer may reprogram the EVSE to bi-directional operation

- A 5-year grace period for the EVSE (from EVSE model year) will be allowed for compliance to interconnection standards
  - Example: Customer purchases an EVSE with Model year is 2022. if the EVSE complies with ALL 2022 certification requirements, that EVSE can be approved for interconnection up to 2026 even if the standards have changed, such as going from UL1741SA to UL1741SB (assume no safety implications)

From PUC Decision: D.20-09-035

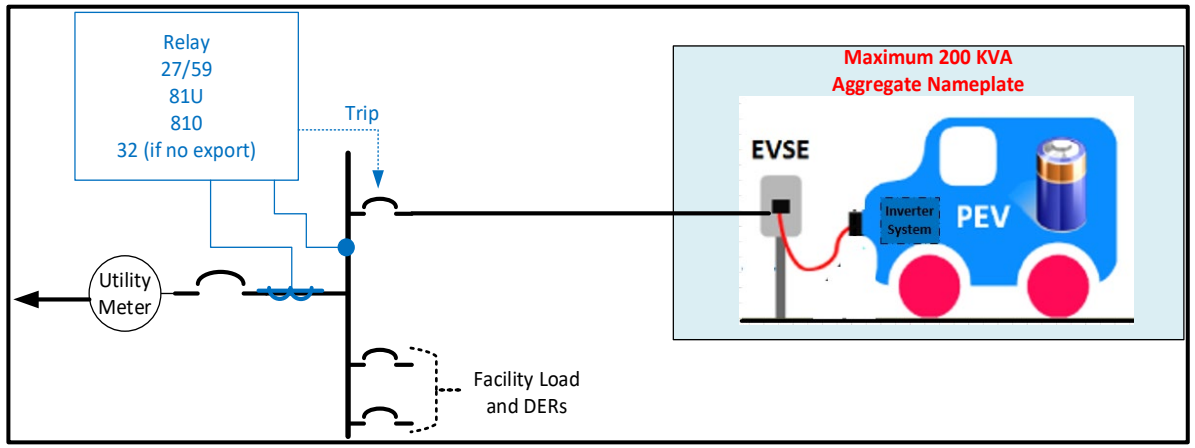
41. Interconnection applicants with a Vehicle to Grid Electric Vehicle Supply Equipment with stationary inverter for direct current charging of vehicles (V2G DC EVSE) system **may request permission to switch to bidirectional mode after completing the Rule 21 interconnection process and receiving permission to operate from a utility.** Only the manufacturer or approved third-party installer may program or enable bidirectional operation after the permission to operate is given by a utility.

V2G-AC Interconnection

Summary

- V2G-AC interconnection **is currently not** allowed (expect for pilot projects – see below)
- Several standards are being developed to support V2G-AC: UL1741SC, SAE J3072, SunSpec J3072-2030.5 Profile
- Projected completion of standards: Q4-2022
- Once standards are developed, several complex issues remain that need to be resolved prior to allowing interconnection of V2G-AC systems
  - Certification processes
  - Listing requirements
  - Default settings exchange and monitoring
  - Etc.
- Projected timing for V2G-AC Interconnection included into Rule 21 - **TBD**

V2G-AC Pilot Projects Are Allowed For Interconnection



- Exempt from Rule 21 Smart Inverter Requirements
- A temporary pathway for V2G-AC pilots has been approved by the Commission
- Pilots will not rely on EVSE-EV equipment (such EV inverter)
- Pilots will rely on Utility Interconnection Handbook requirements
  - Such as relaying installed at the PCC
- Consult your local utility interconnection representative for any specific information

Q&A