

Advanced Technology Integration

Transportation Electrification Technology Assessment and Testing

Controlled testing and demonstration of transportation electrification technologies are critical in addressing concerns about EV adoption. Key stakeholder concerns are presented in the illustration above.



Common Concerns and Complaints from Different Stakeholders Involved in Transportation Electrification

Quanta Technology offers three categories of transportation electrification technology assessment and testing:

- 1. EV Chargers Sub-Metering Accuracy Testing
- 2. EV Chargers Functionality Testing
- 3. EV Chargers Interoperability Testing



Category 1: EV Chargers Sub-Metering Accuracy Testing



Evaluates meter accuracy/performance under various conditions and calibrates as needed. This ensures accurate customer billing.



Category 2: EV Chargers Functionality Testing



Verifies the charger can follow the charging sequence and procedures. The focus is more on items such as charger ramp rate, ground fault protection, etc. The functionality testing of DC fast and ultra-fast chargers requires high-power setups.



Category 3: EV Chargers Interoperability Testing



Verifies that communications between charger, EV, and network comply with the applicable standard protocols (e.g., OCPP, ISO 15118 ...)

- EV charger-to-network communications:
 - Connection to third-party aggregators, or for the purpose of data exchange and telematics, implementing demand response (DR) programs, etc.
- Vehicle to charger



Specific Services

Quanta Technology experts have extensive knowledge in transportation electrification technologies and their requirements. That knowledge is bolstered by engagement in several projects and by hands-on involvement in compliance testing and verifications.

Service: Submetering accuracy testing and calibration using in-house-built testing tools (both AC and DC chargers) (using NIST Handbook 44)



DC Fast Chargers Submetering Accuracy Test Setup



DC Fast Charger Submetering Accuracy Tester



AC Level-2 Submetering Accuracy Tester Fully Portable Design for Field Testing





- Service: Charging stations functional testing (AC and DC chargers up to 500 kW) (IEC 61851, SAE J1772)
 - Service: Interoperability and conformance testing (CharIN-CCS, OCPP, IEEE P2030.1.1, ISO 15118, CHAdeMO)



DC Fast and Ultra-Fast Charger Functionality and Interoperability Test Setup Using RE-VAN



AC EV Simulator for Functionality and Interoperability Testing of AC Level 2 Chargers



QUANTA



Service: Assessment of EVSE impact on the host distribution grid and emerging topics, including V2G



Power Hardware in the Loop Setup for Testing Impact of 350 kW and 50 kW Chargers on the Host Distribution System Using RE-VAN





Service: Service centers of future design and engineering

Fleet electrification necessitates rethinking of the service center design and transitioning of energy source to a fully electric center. The service centers of the future will be required to support electric transportation fleets. To improve the resiliency, a service center should use battery energy storage systems (BESS) along with a local controller (e.g., a microgrid controller) to achieve efficiency, reliability, and integrity of supply and operation. Examples of key-use cases that are commonly discussed in relation to a fully electric service center include:

- Managing utilization of multiple energy resources (PV, BESS, etc.) and controllable loads (water heating, electric vehicle chargers, etc.) to support the day-to-day operation of medium and heavy-duty fleets
- Planned and unplanned island operation of the facility for responding to system events
- Managing electric vehicle charging load during peak time to minimize the impact on the grid and achieve cost savings



Service Center of Future – Conceptual Design





Our expertise spans from regulatory and impact assessment to pilot projects. The map below shows select Quanta Technology EV and DER activities throughout the United States.



Summary of Quanta Technology EV and DER Activities in the United States



