

Bidirectional Chargers: UL1741-SB Waiver Request

March 18, 2024

Technical Standards Review Group

Industry Supporters

- Vehicle Grid Integration Council—a national 501(c)(6) membership-based advocacy group committed to advancing the role of electric vehicles and smart EV charging through policy development, education, outreach, and research.
- Fermata Energy—a leading provider of commercially proven vehicle-to-everything (V2X) technology that enables vehicle-to-grid (V2G), vehicle-to-building (V2B), and vehicle-to-load (V2L) services.
- Highland Electric Fleets—a leader in electrifying student transportation. Our team deployed the first Vehicle-To-Grid (V2G) programs in Massachusetts and Vermont, and partnered with Montgomery County Public Schools to build the largest electric school bus fleet in North America.
- Green Energy Consumers Alliance works to empower consumers and communities to speed a just transition to a zero-carbon world through green energy programming, education, and advocacy.



**Fermata
Energy**



Highland



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Massachusetts: Leader in Bidirectional Charging

- Massachusetts Department of Environmental Protection (DEP) formally adopted the Advanced Clean Cars II standards (ACCII) in March Of 2023.
- ACCII requires car manufacturers to steadily increase the percentage of vehicles they sell that are electric from 35% in model year 2026 to 100% in model year 2035.
- MA's ~5M light duty vehicles when transitioned to EV will be the largest DER on the system (>50 GW)
- Massachusetts is a leader in recognizing the importance of V2X technology and is home to some of the first V2G demonstrations in the nation.
 - Over 32 grid events in the summer of 2022, Highland's Beverly V2G deployment demonstrated the viability of electric buses as V2G resources, providing a template to scale the service at additional deployments in Vermont, Maryland, Colorado, California, Virginia and beyond.
 - BlueHub Energy, part of the national nonprofit community development financing organization BlueHub Capital, and Fermata Energy, the country's leading vehicle-to-grid (V2G) services provider, today launched the first V2G pilot program for multi-family affordable housing in the nation designed to increase affordable access to electric vehicles (EVs) for low-income drivers.



Bidirectional Chargers: Current Status

- In this case the UL standard acts as a barrier to entry for new DERs entering the market.
- Massachusetts is in jeopardy of stunting the development of the V2X industry due to the recent requirement that all devices seeking to interconnect to the distribution system be UL1741-SB certified.
- There are no current bidirectional chargers that we are aware of that have received UL1741-SB certification
- The limited electric vehicle bidirectional V2G-DC charging suppliers today have UL1741 or UL1741-SA certification (and some UL9741)
- The nascent bidirectional charging sector lags behind the larger and more mature solar and storage inverter manufacturers in achieving UL1741-SB certification

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- In recognition of the anticipated timeline for commercially available UL1741-SA/SB certified bidirectional chargers, the California Public Utilities Commission waived the UL1741-SA/SB certification requirement for bidirectional charging stations enrolled in the Emergency Load Reduction Program, Sub-Group A.5 – Electric Vehicle (EV) and Vehicle-Grid Integration (VGI) Aggregators. California adopted the UL1741-SB standard in August of 2023.
- New York State’s Joint Utilities recently approved a time-based waiver for UL1741-SB for bidirectional chargers. New York adopted the UL1741-SB standard on January 1, 2023.
- Given the above and the recognition among Massachusetts’ stakeholders of the importance of bidirectional charging, **we respectfully request that the TSRG recommend that the utilities waive the UL1741-SB certification for bidirectional chargers based on cumulative installed capacity at the circuit level.** We recommend that utilities cap the cumulative installed capacity of “non UL 1741-SB” bidirectional chargers to 500 kW per distribution feeder or higher based on EDC discretion.
- Until the cumulative capacity threshold is met, bidirectional charging stations with UL 1741-SA certification shall be recognized as eligible for interconnection in each of the utility service territories.

Bidirectional Chargers: Current Market Conditions

- All existing certified and listed bidirectional chargers are certified to either UL1741/9741 or UL1741-SA
 - BorgWarner (Rhombus) 60 kW – UL1741-SA
 - BorgWarner (Rhombus) 125 kW – UL1741-SA
 - Fermata Energy FE-15 15kW – UL1741, UL9741
 - Fermata Energy FE-20 20 kW – UL1741-SA, UL9741
- Several chargers are announced or expected to reach the market in the near future:
 - Wallbox – has announced Quasar 2 as UL1741-SB
 - dcbel – Has listing to some section of UL9741, potentially 1741-SB
 - Tellus Power Green: Commercial 20, 40, 60 kW targeting UL 1741-SB
 - InCharge US: Commercial, 22, 44, 66 kW targeting UL 1741-SB
- There are several bidirectional charger options that are not grid-tied
 - Ford F-150 Lightning via the Ford Pro charger/Sunrun system
 - Tesla Cybertruck
 - Kia – various Vehicle-to-Load options
 - Volkswagen – vehicle to home systems for offgrid discharge