

It's Easy To Include Electric Vehicle SmartCharging in Automated Demand Response Programs.

FleetCarma receives OpenADR certification for SmartCharge Rewards and SmartCharge Manager platforms.

FleetCarma.com



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In order for service providers like FleetCarma to effectively support smart charging in various utility energy programs, it is essential for the company to support multiple industry standards, such as OpenADR. OpenADR is an open and standardized way for electricity providers and system operators to communicate Demand Response (DR) signals (electricity price or curtailment event) with each other, and their customers. These communications use a common language to deliver the signals securely over the Internet or any IP-based communications network.

As the most comprehensive standard for Automated Demand Response (ADR), OpenADR has achieved widespread support throughout the power utilities industry. The OpenADR standard is ideally suited to send price signals for specific programs, like EV charging or curtailment signals in the summer, when demand spikes from air conditioners, cooling and other factors. OpenADR makes it more affordable and technically feasible for power utilities companies to stabilize the grid during peak periods, when generation gets dangerously close to energy demand.

The importance of OpenADR

Wholesale electricity producers benefit from the standardization and interoperability of systems used on the grid by system operators, such as utilities and aggregators. These system operators, in turn, own the customer relationship and responsibility to keep energy demand within predefined parameters. They automate communications directly to their customers' control systems and electric vehicle chargers with price and event signals. The customers benefit from this relationship by leveraging the OpenADR interface already built-in to their products. This provides the customer with new efficiencies which result from participation in auto-DR programs, utilizing the OpenADR standard to provide standardized services and pricing.

Expensive investments in new electricity generation and upgraded transmission and distribution equipment can be delayed or avoided entirely through the efficiencies provided by OpenADR. As government entities, businesses and consumers continue to shift from vehicles running on fossil fuels to electric vehicles (EVs), the electric utility industry must adopt a more flexible, scalable and resilient grid.

The risks of unmanaged EV charging for local grids

The challenge for utilities is not that electricity generators cannot produce enough power, the most daunting problem is how electricity is delivered and managed over the "last mile" to households with electric vehicles. The Smart Grid supports the bi-directional flow of electricity, placing extra stress on local transformers. A common problem with electric

vehicles is the “Jones” effect. In other words, one neighbor purchases an EV, then another neighbor buys one, followed by another one. This scenario is common in Silicon Valley, where transformers are at risk of overloading by supporting too many electric vehicles in the neighborhood.

Residential transformers are generally built to manage between 10 and 50 kVA (x1,000 Volt Amps). A single plug-in electric vehicle (PEV) with a 240V, Level 2 charging system consumes about 7kVA. Charging multiple EVs at a time (known as clustering) using a single transformer can permanently damage transformers, or overload them and take them offline. This is a significant challenge for local utilities.

Charging requirements are considerable and continue to grow

Studies show that the rapidly rising penetration of electric vehicles is increasing the risk of transformer “loss of life” by as much as 10,000 times. This problem is not only disruptive to the lives of people directly impacted by power outages, it is also very expensive!

Several utilities are taking a proactive position with the potential impact of growing electric vehicle adoption:

- The Sacramento Municipal Utility District (SMUD) is replacing nearly 17% of their transformers due to EV overload.
- California and Texas are considering the implementation of notification systems to alert utilities to when a citizen purchases an electric vehicle to help them prepare for potential transformer replacements. Other regional utilities are considering adopting similar best practices.
- Bloomberg estimates that electric vehicles will represent 35% of all vehicle sales by 2040, placing greater demand on electricity grids and the energy companies that own and manage them.
- As more system operators and utilities adopt important standards, like OpenADR, EV SmartCharging can provide a cost effective and reliable method for managing the increasing load on utility grids, making adoption of demand-side programs essential to the stability of the grid.

FleetCarma’s approach to the EV load management challenge

FleetCarma offers several solutions and services for electric utilities to prepare for the growing energy demand created by EV charging, such as:

- SmartCharge Rewards™, a plug-and-play EV owner incentive program for owners to receive positive incentives for changing their charging behaviour through gamification principles. This turnkey solution provides utilities the ability to incentivise off-peak EV charging without the long timeline, hassle and substantial cost of installing submeters. SmartCharge Rewards by FleetCarma reduces EV charging costs for owners and increases grid resiliency for utilities.
- SmartCharge Manager™ provides utilities, EV charging providers or EV fleet managers with a powerful tool to directly manage EV charging networks. By providing easy access to vehicle data, administrators are better able to manage vehicle charging demand using real-time information such as battery state-of-charge. Real-time information enables better decisions and efficient deployment through OpenADR-based programs, to better manage EV charging times and electricity tariffs.

The importance of OpenADR Certification for FleetCarma

In a project trial using OpenADR and FleetCarma's EV Smart Charging technology, experts from the The Siemens Interoperability Lab provided invaluable support to the FleetCarma software development team. Information on system implementation, software debugging and OpenADR testing services ensured the development team that their newly developed gateway could interoperate with the Siemens Decentralized Energy Management System (DEMS). The Siemens DEMS is used by utilities to manage and administer their automated demand response programs, by shifting and shaping EV charging loads in Ontario, Canada. This project successfully demonstrated how utilities can utilize EV Smart Charging and other systems compliant with the OpenADR standard in their grid management programs

As the prevalence of electric vehicles increases, so will the requirements for utilities to effectively manage their impact on the grid. Like successful energy saving programs that operate through smart-thermostats, FleetCarma provides the essential technology for utilities to proactively manage electric vehicles in their territory. By obtaining OpenADR Certification, FleetCarma offers turn-key, EV load management platforms through its SmartCharge Rewards™ and SmartCharge Manager™ solutions that can work seamlessly with the many OpenADR certified solutions available today and in the future.

About the OpenADR Alliance

The OpenADR Alliance was formed 2010 by industry stakeholders interested in furthering the technical activities concerning the development, testing, and deployment of products and solutions based on the OpenADR standard. The OpenADR Alliance facilitates the acceleration and widespread adoption of standardized solutions to help create a more reliable and adaptable electrical grid. This standardized approach enables service providers, such as electric utilities and systems operators, to publish price and event signals that can automatically communicate with a wide range of consumer and commercially owned EVs and control systems. The OpenADR Alliance enables all industry stakeholders to automatically participate in automated DR, dynamic pricing, and electricity grid reliability programs utilizing the product and systems that they already own. This helps to eliminate the industry burden of stranded assets that are often the side-effect of their old DR programs. Further industry gains will soon be available through an investment in the OpenADR standard, as its functionality is expanded to support the growing requirement for managing Distributed Energy Resources (DER). For more information on the OpenADR Alliance and standard, please visit <http://www.openadr.org/>

About FleetCarma

FleetCarma is an award winning clean-tech solution provider that has been providing critical technology for the adoption and operation of electric vehicles since 2007. The company provides technology solutions to those industries sharing a common vision of sustainable transportation, such as electric utilities, fleet managers, environmental sustainability entities, and electric vehicle researchers and developers. For more information on FleetCarma solutions visit www.fleetcarma.com