



Nuvve Corporation Announces Four Years of Consecutive V2G Operations of Electric Vehicle Fleet in Denmark

V2G technology leader provides 4 years of nonstop V2G frequency regulation service from Frederiksberg Forsyning

SAN DIEGO, CA – Sept. 29, 2020 – [Nuvve Corporation](#), a San Diego-based, green energy technology company and the global leader in vehicle-to-grid (V2G)O technology has been performing ongoing frequency regulation service for the Danish grid operator, Energinet, for four consecutive years. The first fleet of vehicles began service in September 2016 at Frederiksberg Forsyning, a municipal water and gas utility company in Denmark.

The operation started in collaboration with Danish Technical University (DTU) which led several research projects with different automotive OEM manufacturers alongside Nuvve to demonstrate the benefits of V2G technology. Specifically, the project aggregated multiple electric vehicle (EV) batteries to provide a primary frequency-controlled reserve service (FCR-N) to Energinet, the transmission system operator. Eastern Denmark is part of a wider Noordpool market area encompassing Norway, Sweden, Finland and the Baltic countries, and has a dynamic frequency regulation market particularly well-suited for aggregators of small-scale resources such as EV batteries.

With early input from Energinet, Nuvve was able to adapt and develop its V2G software to match requirements for market participation and interconnection to the grid. Because EV batteries have a finite capacity, Nuvve's software is able to ensure a fixed capacity delivery to the FCR-N market from variable assets: EVs that plug in and out at different times with different states of charge. Intelligent aggregation is what turns V2G into a strong case for providing FCR with grid services. After the DTU project ended in January 2019, Nuvve continued operating under a commercial agreement with the customers.

"Energinet considers cooperation across sectors, with startups, and with commercial partners to be crucial for us as a transmission company to contribute to Denmark achieving its very ambitious climate goals," says Signe Horn Rosted, area manager at Energinet. "Today, we have an electricity system where large parts of energy production fluctuate and this requires completely new technologies such as V2G and market solutions in order for us to ensure supply and stability in the electricity grid. Electric car batteries participating in the frequency market is clearly one of the innovative solutions we need."

The vehicles used in this commercial V2G operation are each connected to 10kW bidirectional DC chargers that are controlled by Nuvve's V2G GIVe™ platform. As soon as a vehicle is plugged in, Nuvve's software automatically takes control of the vehicle's charging and discharging. Nuvve bids the available capacity in the batteries by aggregating multiple vehicles



across eastern Denmark on the frequency-controlled reserve market. Nuvve also ensures the vehicles have the energy required to drive when needed. From the user perspective, the V2G operation is seamless. They can use Nuvve's fleet management app to set driving needs for any given day so their driving duties can always be fulfilled.

"At Frederiksberg Forsyning, we are proud to have been pioneering this technology that is now a showcase around the region" said Kristian Beyer, head of strategy. "Nuvve has made it easy for us to use V2G and being on the forefront of green technology is very important to us and to the city of Frederiksberg".

Over the four years, Nuvve has been able to accumulate hours of valuable learning on fleet operation and energy market behavior. Nuvve has since expanded its commercial V2G operation to other customers in Denmark. The Frederiksberg Forsyning fleet is driven primarily during the day and is parked during nights and at weekends, allowing it on average about 17 hours of available market participation per day. Energy markets fluctuated over the two-year period from 2017 to 2018 but allowed each vehicle to contribute approximately US\$2,000 in market revenue on average. The revenue allows Nuvve to provide its customers with a lower total cost of electric vehicle ownership through benefits such as reduced charger costs, low or free energy costs to drive, fleet management tools, and yearly maintenance.

"From operations on the ground to market bidding and participation in Denmark, we have shown a continuous benefit with end-to-end EV charging controlled by our platform", said Gregory Poilasne, chairman and CEO of Nuvve Corporation. "Next year, we are looking forward to expanding our customer base in the Nordics with new efficient V2G chargers suitable for fleets and even home use."

From its office just outside of Copenhagen, Nuvve is participating in additional V2G research projects and is in the process of developing commercial partnerships to continue its growth in the Nordic region.

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About Nuvve Corporation

Nuvve Corporation is a San Diego-based green energy technology company whose mission is to lower the cost of electric vehicle ownership while supporting the integration of renewable energy sources, including solar and wind. Our proprietary vehicle-to-grid (V2G) technology – Nuvve's Grid Integrated Vehicle (GIVe™) platform – is refueling the next generation of electric vehicle fleets through cutting-edge, bidirectional charging solutions. Since our founding in 2010, Nuvve has been responsible for successful V2G projects on five continents and is deploying commercial services worldwide. For more information please visit www.nuvve.com or follow us on LinkedIn and Twitter.



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