

# VEHICLE TO GRID (V2G) – NETWORK IMPACT PROJECT



## FACTS

RESEARCH AREA	Network Planning & Design
START DATE - END DATE	Dec 2017 - Dec 2019
FUNDING MECHANISM	Network Innovation Allowance
ESTIMATED EXPENDITURE	£250,000
PROJECTS PARTNERS	NUVVE - Newcastle University
MORE ON	<a href="http://www.smarternetworks.org/project/nia_npg_014">http://www.smarternetworks.org/project/nia_npg_014</a>

## CONTEXT

Nissan and NUVVE have announced plans to roll out vehicle to grid (V2G) technology in the UK. V2G provides an opportunity for electric vehicle (EV) owners to earn income from their car battery through the provision of grid services, initially to National Grid, via an aggregator.

## APPROACH

This is a network impact and technology demonstration project to investigate the challenges and opportunities of bidirectional/vehicle-to-grid (V2G) chargers on distribution networks.

The first objective of the project is to examine whether Northern Powergrid designers and connections process are able to accept a V2G bidirectional electric vehicle charger under ENA guidelines before the need for reinforcement is triggered.

The second objective is to understand what the benefits of these chargers are and how they can support the distribution network. For example, the project will examine the extent to which electric vehicle batteries coordinated by an aggregator can alleviate network stress peak loading.

Finally, the project will look at the effect of these chargers on the supply power quality.

## EXPECTED OUTCOMES

This is a research project with the aim of revising our connections process for the connection of V2G chargers and providing guidance to designers on whether it would be appropriate to give any allowances in their design assumptions on applications to install vehicle to grid enabled charging systems on distribution networks. This V2G EV research will provide additional learning to inform designers about whether any de-rating will be appropriate after taking into account how these chargers can be externally controlled and extrapolation of the learning may enable different de-rating factors to be applied for different levels of vehicle charger penetrations.

This learning, as it emerges, will – if conclusive - be fed into Northern Powergrid's design policies and also into the review of Engineering Recommendation P5.

## LONG TERM PRIORITIES



Network Environmental Footprint



Network Reliability & Availability



Network Management & Flexibility



Demand-side Response



Network Planning & Design



Communication & Engagement



IT-enabled Process Improvements



Social Responsibility