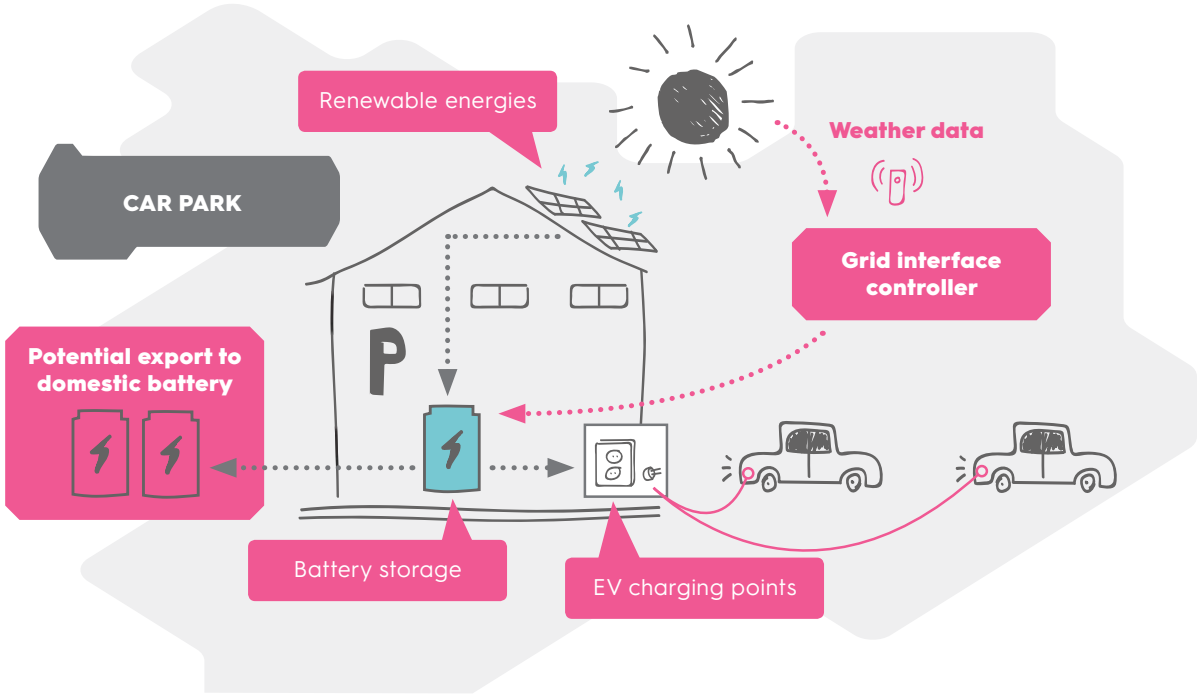
FACTSHEET G2 + G4

RUGGEDISED

EV-charging hub battery storage and optimisation of the integration of near-site RES

Glasgow

Smart electricity grid & e-mobility



These solutions represent a technological and business case challenge linked to the physical deployment and connection of onsite battery storage, as well as understanding how energy is purchased from local generators, supplied to the battery, and sold by the storage provider either to local points of consumption or to provide grid balancing services.

Main partners involved:

SIEMENS

SP ENERGY NETWORKS

Glasgow CITY COUNCIL

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 731198. The sole responsibility for the content of this document lies with the RUGGEDISED project and does not necessarily reflect the opinion of the European Union that is not responsible for any use that may be made of the information it contains.

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How does it work?

The objective of this solution is to devise a way in which renewable energy can be generated and stored at source to support demand from buildings and demand from electric vehicles. The inclusion of battery storage ensures that the maximum onsite usage of the renewable energy can be achieved, minimising any export to the national grid. This will result in raising the value of the power generated by avoiding purchasing from the grid and exporting at a significantly lower value. Further benefits will be extracted from the battery storage via offering ancillary grid services such as load balancing and voltage control. The project will evaluate the most advantageous control hierarchy to ensure that the renewable-generated power is utilised for the highest value and social amenity. The energy created by the 200kWp solar array will be fed into a battery and then directed either into a selection of fast and rapid EV charge points or to the base load demand of the building.

The development of control software and hardware will evaluate electricity market conditions and grid demand requirements, as well as potential oversupply from other renewables on the grid, and decide on how the battery is charged and discharged. Weather data will be used to monitor the probable level of generation coming from the renewables and thus affect the discharge rates to ensure that the required capacity is available for the following day. The feasibility of notional transfer of power between non-domestic and domestic batteries will be investigated.

This solution will also look at the opportunity to integrate vehicle-to-grid technology through application of the most current EV charging infrastructure ommunications software, thus integrating EV batteries as an extension of the smart grid, capable of providing energy to the grid as a demand response, as well as consuming energy.

Estimated impacts

The solution should utilise battery technology to:

- Significantly increase the utilisation of locally generated renewable energy.
- Provide ancillary revenues from the provision of grid balancing services
- Minimise export to the grid
- Provide resilience to the grid
- Minimise conversion losses by managing as much power transfer over DC before inverting to AC.

Replication potential

Glasgow City Council operates 6 multistorey car parks. In addition, a number of private car parks exist in the city. Successful delivery of battery storage linked to EV charging could result in deployment of this technology in Glasgow City Council-operated car parks alongside EV charging deployment. Additional work will be done to engage private car park owners regarding deployment on their sites.

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