

Open Energy Stand Alone PV/battery system for the bike hub Pilot Report

Project Title:	Stand alone PV/battery system for the bike hub	
Delivered by	Open Energy	
Start date:	1/1/21	End Date: 15/6/21
LEADER Theme:	Climate change	

1. Introduction

A new bike hub has been built close to the new riverside venue in Newtown. This building will be used as a base for bike hire, and to provide a safe facility for bike parking and storage for the public, and for charging of electric bikes.

A mains connection was investigated, but would have cost a very high figure because the network does not have a high capacity at that point, and Scottish Power (who provided the connection to the Riverside Venue) would not permit an additional building to be connected in addition to the connection provided to the Riverside Venue. For this reason, alternative means of supplying electricity were investigated.



PV panels mounted flat on the roof of the bike hub, providing light and charging for electric bikes.

The option of a self-contained PV/battery system was proposed. The main use for electricity will be lighting and charging of electric bikes, neither of which will require a very heavy supply.

The main limitation would be to ensure there was sufficient power in the winter months when the amount of daylight is least. Some simple calculations were carried out to work out the likely power requirement for lighting during December and January, and working out what PV capacity would supply this (using the PV estimator at PV GIS) . The system as eventually specified included the following:

System specification for bike hub PV/battery

- 4 x 305W solar panels
- 1kW inverter
- 12V 140aH lead acid battery (1.6 kWh of storage)

The total cost of installation, including equipment and installation was £5,362.

The system was installed in July 2021 and is now functioning and providing the building with light and power. Monitoring its effectiveness will allow us to assess whether this would be an appropriate solution in other situations.

2. Challenge

One problem that arose in the installation is that since the discontinuation of the Feed in Tariff, many of the local solar PV installers (often these were existing electrical contractors) have stopped this part of their service. One local installer was identified for the work, but part-way through, and before we got to the installation phase, they informed us that the one staff member that looked after PV installations has retired and they were not intending to continue with PV installation.

An alternative local supplier was found, but Newtown has gone from having several local PV installers to just one still active in this sector, because of the cuts to PV funding.

An additional challenge, as yet not fully resolved, is to what extent the shading that the building experiences will affect the yield from the solar panels. There are trees to the south of the building which will affect output during parts of the morning, so the site is not ideal for solar panels. This has been taken into account in sizing the system, but the result will only really be known once we get into the winter months.

3. Solution

A replacement installer was identified, but there is a lack of PV installers in the Newtown area, and this will have an impact for people with existing PV installations who will find it hard to get servicing and maintenance carried out.

4. Benefit

The installation here will provide carbon free light and power to the building at less cost than providing a mains installation. It will also act as an example to demonstrate this option for other similar situations.

There is considerable interest in battery systems installed in conjunction with PV panels, and these are being promoted heavily by PV salesmen. Our calculation at the moment is that for a grid connected system, it is still not financially attractive to install a battery system, but prices have come down considerably in the last few years and if this trajectory continues, it will in the near future become an attractive financial option.

5. Result

This installation has solved a power supply problem in Newtown in a way that also is low carbon. The falling price of PV and batteries means that a stand-alone system such as this is becoming much more practical for many remote situations where small amounts of power are required.



The test will be whether power can be supplied continually through the winter months when sunlight levels are low. The system has been designed to accommodate this but the affect of shading and other issues cannot be accurately predicted.

6. Project Contact Details

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