

Initial energy storage asset testing discussed at first MANIFEST researcher workshop in Manchester

Date

07.09.17

Summary

Researchers from the MANIFEST consortium met at the University of Manchester in September 2017 to discuss initial testing on energy storage systems across the consortium.

Full report

As part of Work Package 3 (Grid Scale Integration), researchers from our project partner institutions are tackling an exciting challenge – how to meet current and future system needs through the control and integration of energy storage technologies with different characteristics.

Within the MANIFEST partner institutions, there is a [variety of different energy storage pilot plants](#) of varying scales. We have an assortment of batteries (lithium-ion, lithium titanate and, sodium nickel chloride, second life, lithium ion with lithium titanate cells), supercapacitors and thermal-mechanical storage (packed bed sensible heat, liquid air energy storage) technologies within the consortium.

In MANIFEST, operational runs of energy storage pilot plants will inform us of how the different assets perform in different scenarios. Using this data, we will be able to understand the different types of grid services that each asset (or combined assets) can provide. There is a large range of services which we will explore during the testing phase of the project, from Enhanced Frequency Response (responding to the grid's requirements in <1 second) to energy arbitrage (storing off peak electrical energy and discharging when electricity prices are highest), to name just a few.

As an action from the MANIFEST kick-off meeting (January 2017), the University of Sheffield agreed to lead a piece of work, in conjunction with the University of Manchester, on preparation of a calibration testing procedure for their respective battery energy storage systems (BESSs). The purpose of the calibration tests was to share the specification of each asset, demonstrate its operation to deliver real power, reactive power and frequency response, and to align formatting of initial datasets from the BESSs.



*Photo 1: Willenhall Energy Storage System
(Managed by the University of Sheffield)*



Photo 2: SieStorage Facility (Managed by the University of Manchester)

Sheffield and Manchester compiled the work into a report, [which is available on request](#) subject to approval from the authors. The output of the report is that we now have a snapshot of capability across two of our assets with respect to power control but also data logging capability. [If you would like to see the datasets from Sheffield and Manchester, please click here.](#)

During the meeting, researchers discussed the tests in detail, explaining the background and any interesting findings that occurred.

Researchers highlighted that a valuable next step would be to upload the calibration report and data to the UK Energy Storage Observatory (a deliverable of WP4), in order to demonstrate our activity but also to understand more about the processes surrounding data uploads. Birmingham, as WP4 lead, agreed to take this forward with Manchester, Sheffield, and the Science and Technology Facilities Council.

One of the key discussion points was how the consortium could extend the tests to the other energy storage assets available within partner institutions. As an outcome, Manchester offered to lead on the development of a MANIFEST based energy storage asset matrix. In the document, the capability

of the assets will be mapped, along with their ability to meet certain grid services such as those mentioned above.

Once the asset matrix is developed, researchers in the consortium will review it and, based on the information provided in the matrix, break out into smaller collaborative working groups to develop a longer-term test schedule. The test schedule is a major deliverable for MANIFEST and it will act as a driver for much of the research to come over the next few years. The tests will deliver valuable operational data that will be stored in UKESTO for the wider community to access.

Find out more

If you would like more detail on any of the items in this article, please contact Omar Saeed on o.saeed.1@bham.ac.uk or 0121 414 7608.