Energy storage for load shifting london

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Energy storage will be an important component of future energy systems. The aim of this roadmap is to assess its role in the UK"s transition to net-zero, and to identify the contribution of research and innovation to meeting the deployment challenges.

The Supergen Energy Storage Network+ is an integrated, forward-looking platform that supports, nurtures the expertise of the energy storage community, disseminating it through academia, industry, and policy, at a particularly important time when decisions on future funding and research strategy are still being resolved. The Network is supported by the EPSRC through grant EP/S032622/1.

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Energy storage can play a critical role in the transition to a low-carbon energy system. The precise scale and nature of this role will depend on technological, system and policy developments. However, there is a well-defined need for measures that provide energy system reliability and resilience across timescales, to meet demands for power, heat and transport. The challenges will shift through the 2020s to the provision of GW-scale capacity, to cover days of demand for electricity; and then to weeks or months of TW-scale demand for heat.

Currently, the growth in variable RES generation is increasing the need for ancillary services to maintain network stability.A number of energy storage technologies can provide these services, with electrochemical batteries now competitive in some markets, such as frequency response and short term system capacity..

During the early 2020s, there is likely to be a continued increase in large-scale generation from variable RES that displaces fossil fuel generation, though there are uncertainties around the levels of firm and baseload capacity. Increased distributed generation and a growing up-take of EVs will drive a need for more flexibility in the system, especially at a local scale.

Energy storage at GW-scale will have the opportunity to provide intra-day peak shifting and inter-day load levelling to maximise the utilisation of available generation capacity on existing networks. Energy storage facilities could be distributed and aggregated to meet local and national needs. Additionally, batteries will increasingly be used for EV applications that could be integrated into the energy system to provide flexibility,

if technical and policy/regulatory measures are in place.

There is also a risk of jurisdictional arbitrage, that late-stage development and deployment moves to overseas markets where the value of energy storage can be exploited, and the value from innovation funded in the UK is lost.

For energy storage to fulfil the roles and provide the value identified in this Roadmap, then a number of actions will be required. Some of these are a continuation of existing measures, others are new and should be implemented now, while for others preparations should be made to implement them in the coming years. These actions, the energy storage potential they are intended to reach, and the recommended timing for their implementation are describe below and summarised in the table.