

Hi,

Please find a response below on behalf of Project ADSorB (<http://www.adsorb.ac.uk>), funded under the BEIS NZIP Longer Duration Energy Storage programme.

What are the opportunities that your innovation could unlock in terms of the future of distributed flexibility?

We are developing two technologies for longer duration thermal energy storage within domestic dwellings – a phase change material store with a target capacity of 10kWh and storage duration on the order of several days, and a thermochemical store with a target capacity of 140kWh with an essentially unlimited storage duration. In parallel, we are exploring the predictive control paradigms that may be employed to maximise the benefit of domestic storage devices that operate over a range of storage durations. Achieving these aims offers significant opportunities for both the occupant and the grid, minimising energy costs for the end user and providing a mechanism for peak shifting, grid reinforcement deferral etc for transmission and distribution network operators. The opportunities for distributed flexibility that may be unlocked through such innovations is potentially huge – whilst each individual store may be considered ‘small’ relative to grid-level storage devices, there are 28 million domestic dwellings in the UK. The vast majority of these will require some form of retrofit during the planned transition to low-carbon heating systems, with thermal storage offering a low-cost route to maximising the value of assets such as heat pumps.

What have been some of the major barriers your business has faced when seeking to unlock the potential of distributed flexibility?

Aside from the inevitable technical challenges involved in developing novel storage options, the primary challenges faced are commercial. At its simplest, if we are to convince consumers to invest in a domestic storage device, the financial case has to stack up convincingly. Assuming there are no policy incentives on the horizon, and leaving to one side some of the co-benefits of (for example, the value of thermal energy stored at point of use during power failure events) then this comes down largely to a simple return on investment calculation for many consumers. Maximising self-consumption from local generation (e.g. solar thermal and/or PV) and being able to take advantage of flexible energy tariffs currently dominates this calculation. Having a mature market for flexibility services – and devices designed to make use of them – could make a further major contribution to the commercial viability of these products. There is also a tension between the needs of the occupant and the electricity network. Again, having a mature market for flexibility services may go a long way towards addressing this tension, with flexibility services designed and priced in such a manner that grid and occupant needs are brought into alignment.

What is your vision for how to accelerate the delivery of accessible, coordinated and trusted markets for distributed flexibility? How could the current policy/regulatory environment change to better unlock your proposition?

Having a single exchange for flexibility services would be a major step towards realising a trusted market. At present the commercial case for domestic storage is dominated by the savings that may be achieved using particular energy tariffs, thanks to (1) accessibility and familiarity (all consumers need to choose a tariff!) and (2) the price differentials that may be achieved. The barriers to access for other flexibility services are far higher. The revenues that may be achieved are often viewed as too small to justify the complication for domestic customers. Having a single exchange could go some way towards simplifying the journey towards effective delivery of flexibility using CER, as well as potentially promoting a degree of “competition”/price discovery between services.

What are your views on the 4 archetypes Ofgem has proposed for a common digital energy infrastructure?

Our view is that there is great value in aiming for an offering aligned to either the middle or thick options. We feel a one-stop-shop with certainty over maintenance etc is a very desirable point to aim for. We also feel that enabling full optimisation is a highly desirable long-term target, and a huge opportunity would be missed if the design of a common digital infrastructure precluded this. We feel that the best balance between early implementation and rigour of approach may be to develop a roadmap of activities. This would prioritise delivery of a single exchange as an early objective (perhaps initially offering a limited set of services), enabling CER devices to be developed around this offering as soon as practicably possible and for price exploration mechanisms to mature. Work to implement future cross-sector optimisation could then be allowed to progress at its own appropriate pace in a “behind the scenes” fashion.