

Be ever ready

Peter Kershaw answers some key questions on battery storage



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This article explores emerging development opportunities around electricity and focuses on the benefits and risks of battery storage or short-term operating reserve (STOR) energy initiatives.

Which types of organisations might consider energy storage developments on their estates?

Local authorities, hospital trusts, universities and charities should consider the merits of utilising their estates to store energy. High-energy-consuming organisations might see battery storage as a way of:

- producing their own energy to help reduce the costs of powering their estates; and/or
- creating an additional income stream by exporting excess energy to the National Grid.

Why is there a need for more energy storage on land in the UK?

- Traditional means of energy distribution from sources like coal-fired power stations are increasingly nearing the end of their operational lives.
- Renewable energy sources often only provide intermittent energy supplies to the National Grid.
- Electricity demand is set to rise as millions of electric cars are introduced between now and 2050.
- Battery storage can help significantly reduce the cost of regular investment in the UK electricity system and distribution networks.

How might this significant shift in energy storage and distribution impact on the UK?

The 2016 National Infrastructure Commission report *Smart power* emphasised the potential for the UK to be 'a world leader' in using some types of energy-storage technology. According to the Engineering and Physical Sciences Research Council, the UK is already currently 'world leading' in some niche areas of energy storage, including lithium-ion battery and supercapacitor research.

The National Grid's *Future Energy Scenarios* July 2017 report highlighted that electricity storage capacity totalled 4GW in 2016 and this could grow rapidly to almost 6GW by 2020. It pointed out that:

The energy sector is becoming more diverse with a move away from a small number of large companies to a wide range of smaller providers and innovators.

What energy storage development opportunities exist for landowners?

There is a diverse range of potential opportunities emerging for landowners due to the low and expected continued falling costs of battery storage technology. The following list is not exhaustive but includes:

- energy barns (large storage batteries connected to high-voltage electricity networks with multiple batteries and associated control systems located near to power lines and electrical substations and housed in air-conditioned agricultural-type units, or in containers on a hardstanding);
- retrofitting battery storage alongside existing solar farms;

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- retrofitting battery storage alongside existing wind farms;
- providing battery storage projects in conjunction with solar barn roofs;
- providing battery storage in conjunction with other

- providing charging points for electric cars.

How can stored electricity potentially be utilised by landowners?

Landowners can utilise the energy they store in many ways. Some examples include:

- replacing conventional transport fuels with electricity stored in batteries;
- regulating energy flows to maintain reliable flows for household, community and national electricity systems (by ensuring electricity supply matches electricity demand) – this helps make up for intermittent gaps in energy supply when a lack of sun and wind reduces the efficiency of solar farms and windfarms, when power produced by power plants is interrupted, or when flooding causes electricity grid failures;

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- small-scale renewable projects connected to local distribution networks;
- providing community battery storage projects, alongside photovoltaic technology, to provide neighbourhood/ community level energy distribution; and

- helping to improve the cost efficiency of energy supply by avoiding the need for future network expansion (this can be achieved by storing electricity when demand for the grid is low, in order to help reduce users accessing the grid when demand is high);

- enhancing the value of existing onsite energy generation; and
- helping to reduce landowners' electricity operating costs.

What is STOR energy?

STOR is about generating energy and then storing it for when 'rapid' provision of active power

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is required by the National Grid to help meet surges in demand. STOR energy can produce energy for the grid for as long as energy is required and can therefore potentially be a very reliable reserve to store and discharge energy to the grid whenever required.

What might the future hold for energy storage?

A cautious observation from the Houses of Parliament Parliamentary Office of Science and Technology, in 'Energy Storage' (Post Note 492, April 2015), concluded that:

The amount of future energy storage deployment is uncertain. It is also unknown if one or two technologies will dominate, or whether there will be a mix of technologies for different uses. Most observers agree that storage will become more economically viable as fossil-fuel-based alternatives become less competitive because of policies to reduce greenhouse gas emissions and long-term rising fossil fuel prices. Capital costs of storage technologies may also decrease. Other factors also influence the viability of each storage sector.

Risks

Potential risks when introducing battery-based energy storage and generation schemes include the following:

- Battery storage and STOR energy developments can potentially sterilise future residential development in and around land and thorough financial, surveying and legal advice should therefore always be sought before embarking on any schemes or entering into any agreements.
- Battery storage and STOR energy are relatively new technologies and the safety risk of each development should be closely considered.
- Battery storage or STOR energy may not be the only potential use for which planning permission could be gained.
- Planning permission is never the guaranteed result of submitting a planning application.

How might battery storage planning applications be received by local planning authorities?

Energy storage, especially from new battery storage technology, can potentially on suitable sites and on some constrained sites provide landowners with a new opportunity to maximise the potential of their

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land (if their land is appropriately located near to power lines).

Battery storage in particular can have the potential to provide a form of development that is relatively unobtrusive compared to other forms of development. This, coupled with the national need for energy storage, may well be seen as a favourable form of development by local authorities and local communities.

As with all proposed developments however, landowners need to think very carefully about their planning strategy before putting their proposals to local authorities and local communities to consider. They especially need to fully research the local and national planning policy context of their site.

Gaining planning consent for battery storage schemes

Planning consultants can help with the consent process, which includes:

- working with architects at an early stage in the development of the scheme;
- public engagement with the local community from the early stages of the proposed scheme;
- creating plans and documents required to support the application;
- potentially, additional expert technical reports that might be required to be commissioned to support the planning application;
- discussing the project before planning committees;

- liaising with councillors and other stakeholders to respond clearly and positively to any questions that may be raised in relation to the proposed development; and
- clearance of planning conditions (if planning permission has been granted), or appealing the council's

decision (if the application is refused).

Energy storage opportunities

The following organisations are all high-energy consumers and should therefore consider the merits of an energy storage scheme on their land:

- local authorities (to drive down the operating costs of their estates, or to provide community energy initiatives to reduce electricity costs for their residents and to address fuel poverty);
- hospitals (to drive down the operating costs of their estates and/or to maximise potential dual use of their car parks, excess or constrained land);
- universities (to minimise their operating costs, or to maximise the potential of their estates);
- charities (to reduce the overheads of their estate, or to maximise or diversify land bequeathed to them through legacy donations);
- commercial organisations (to reduce their operating costs and assist with reducing their carbon footprint); and
- farmers and rural landowners (to maximise or diversify the use of their land, lowering their overheads – often providing a useful development opportunity on constrained land). ■