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AMAZING ENERGY

How to generate revenue from battery storage in 2021

The UK's energy system is undergoing one of the biggest transformations in its history, as a reliance on fossil fuels is replaced by a drive towards greener, cleaner energy.

Low carbon generators, such as solar and wind, are increasingly forming part of the energy mix. So too are interconnectors, which enable renewable energy to flow between neighbouring countries, with battery storage and flexibility providers playing a crucial role in supporting the transitioning system.

By 2021, operational battery storage capacity in the UK had reached around 1,300MW and with the UK targeting net zero carbon emissions by 2050, the sector is on track for strong growth.

Lower capital costs and strengthening revenue forecasts have both helped boost investor confidence, along with key reforms relating to behind the metre storage devices, which have increased the opportunities for smaller batteries too.

For utility-scale battery asset operators, there are a growing number of ways to generate revenue in this complex and continually evolving market, which is why working with a specialist optimisation partner is essential.

So, what are the opportunities to make money from batteries right now?

Battery storage revenue streams

The key revenue streams available to batteries today, focus on two core applications:

Frequency – Batteries can help maintain grid frequency by offering synthetic 'inertia'. This is increasingly important as more and more renewable generators come online and the system loses the inertial stability provided by traditional spinning generators.

Balancing the system – Batteries can help balance the grid, by storing energy at times of low demand and releasing it at times of high demand, when it is most needed (usually morning and afternoon peaks respectively).

Ancillary services

Ancillary services reward battery operators for supporting grid stability by helping keep grid frequency at required levels. In the UK – as across most of the world – this is around 50Hz. National Grid is obliged by its licence commitments to control the frequency and ensure it is within ±1% of this level.

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Large deviations in system frequency can be caused when there is too much generation compared to demand, and vice versa. For example, when a power station unexpectedly trips and shuts down. Battery asset owners can be financially rewarded for helping manage such incidents. Firstly, by being on standby and available to react, and secondly through utilisation payments that may also be available depending on the type of service.

Firm Frequency Response (FFR)

Over the past 5 years, as the UK's battery capacity has increased, the revenues available via FFR have reduced. This is because there is a limit to the amount of storage capacity that is needed. As more batteries have come online, the market has reached the point of saturation.

FFR is now being phased out in favour of a suite of new products, which includes Dynamic Containment (DC), Dynamic Moderation (DM), and Dynamic Regulation (DR).

Dynamic Containment (DC)

Dynamic Containment is one of the newest services to be launched by National Grid ESO. It is designed to act rapidly when triggered by a fault on the system, to catch and 'contain' the resulting deviation in frequency. When compared to FFR it establishes more demanding requirements, aiming to address the frequency deviations even quicker.

As opposed to the week-ahead and month-ahead procurement of FFR, Dynamic Containment is procured day-ahead. This means aggregators need to be analysing the data and making complex decisions every day.

In the same way as we have seen with FFR, this market is likely to become saturated in the coming years, which will impact on potential revenues.

Balancing Mechanism (BM)

National Grid uses the Balancing Mechanism to ensure there remains an almost equal amount of energy supply and demand, with frequency changes mopping up the difference. Battery operators can earn revenue by participating in the BM and helping National Grid balance the network, by charging or discharging power to move energy where it is needed.

As the BM is an ad hoc way for National Grid to utilise flexibility with little forward commitment, the financial rewards can fluctuate. However, we have already seen some very high prices this year.

In contrast to ancillary services, which only require a certain level of capacity, the balancing mechanism is a well-established source of opportunities. But it is one that requires real-time monitoring and specialist expertise in order to competitively price the bid/offer and correctly manage the state of charge through the wholesale power market.

The fundamentals of the Balancing Mechanism are also improving, making it one of the strongest available to battery operators today. In tandem, more attention is being given to smaller assets by National Grid, who traditionally only focused on large generators, such as combined cycle gas turbines (CCGTs), opening the door to further opportunities there.

Wholesale trading

As frequency-related ancillary services become saturated the value for storage assets will move towards wholesale trading and the balancing mechanism (BM). Wholesale trading, similar to the BM, requires constant monitoring and to achieve the optimum returns you should work with an experienced team who are experts in this area.

Within wholesale trading there are a variety of trading options (including day ahead, intraday, forwards) and different strategies will need to be tailored based on factors such as the type of battery, warranty, the market conditions – and even the owner's risk appetite. Before this occurs, it is important to have market access and a trading strategy that complements ancillary service delivery and manages the health of the battery without taking undue risk with imbalance prices.

In summary

The UK government's commitment to reaching net zero carbon emissions by 2050 continues to be a huge driver for the growth of battery storage.

As the demands being placed on the grid continue to increase, with the decarbonisation of the heat and transport sectors, this means more and more renewable energy will be needed. As these renewable generators come online, the amount of battery capacity required to help balance the grid will also need to increase, with solar, wind and storage sitting at the heart of the low carbon energy system of the future.

For battery asset owners, the financial opportunities are clear and working with a specialist optimisation partner who truly understands the complexities of the fast-moving energy market, will be key to achieve the highest potential lifetime yield.

Find out more

At Anesco, we offer a complete data-driven revenue optimisation service for storage and renewable assets. Our focus is on maximising the health and long-term revenue potential of assets, to generate the greatest potential returns. Combined with our industry-leading operations and maintenance (O&M) services, we can provide an efficient and effective all-in-one maintenance and optimisation solution.

For more information, please contact the Revenue Optimisation team: optimisation@anesco.co.uk or call 0845 894 44 44.

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