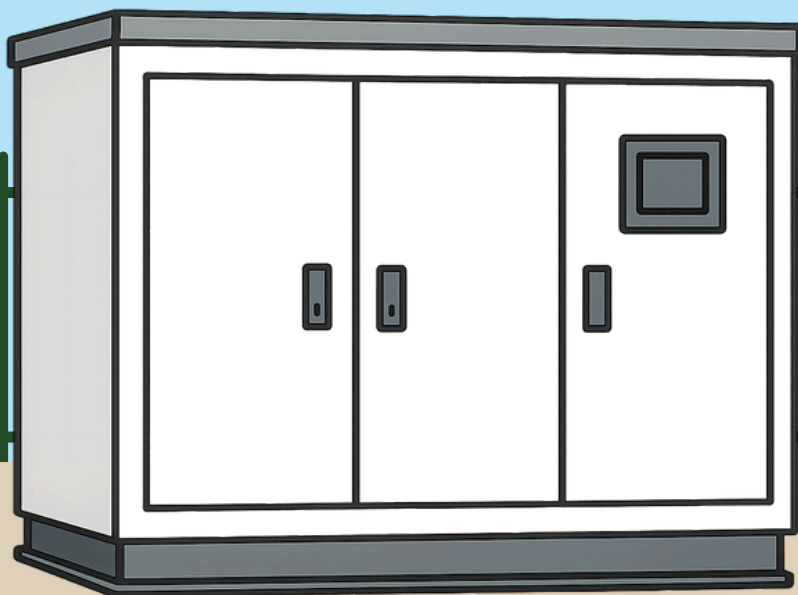




Case Study

Smart Battery Tariff



Summary

- **Location:** England, Henlow
- **Capacity:** 50 Kilowatts/107 kWh Battery Energy Storage System
- **Type:** Smart Energy Project
- **Designer and installer:** Vilion, Q Energy
- **Owner:** An independent retailer
- **Panel type:** N/A
- **Completion date:** June 2025



Vilion was founded in 2019, carrying the technological heritage of the top 5 global battery enterprises, and backed by a major shareholder, Itochu Corporation. Vilion BESS products have already been recognized in over 30 countries across more than 400 project sites, all while maintaining a zero accidents.



Q Energy is a Manchester-based technology company specialising in intelligent energy management. It reduces energy costs and carbon emissions through AI-driven optimisation of on-site assets. Together, they delivered smart energy solutions for many businesses across the UK.

Overview

The retailer was looking for a smarter and more flexible way to manage rising energy costs. Vilion and Q Energy addressed this need with the AI-powered Smart Battery Tariff, engineered to maximise battery optimisation and deliver consistently higher ROI. This has allowed the tariff to offer 15% guaranteed savings against the best fixed tariff in the market, giving the retailer confidence in the financial outcome from day one.

To accommodate different investment preferences, the solution was offered through both CapEx and CapEx-free battery options. Confident in the guaranteed savings and clear payback, the retailer chose to self-finance the 50 kW / 107 kWh Vilion BESS, which Vilion and Q Energy jointly engineered and deployed as a fully integrated solution.

The solution offers a unit rate 3p/kWh below the best fixed price, providing budget certainty and access to energy-trading benefits. It enables the battery to integrate with flexible tariffs and respond to wholesale market price movements, charging during low-cost periods and discharging when prices are higher.

By intelligently controlling the battery, Q Energy's AI optimisation platform also reduces non-energy charges such as peak-time costs, winter levies and shaping and risk charges. In addition to market-based optimisation, the system is integrated with the site's existing solar PV array, allowing excess solar generation to be stored and increasing overall solar self-consumption. Vilion's hardware and on-site engineering ensure all charge and discharge cycles required for these strategies are executed safely, reliably and with high operational efficiency.

The solution enhances the value of battery storage through wholesale trading while reducing payback uncertainty, making low-carbon investment lower-risk and financially attractive. It also serves as a strong proof of concept for wider rollout across similar high-consumption environments.

Project Summary

The retailer operates in a specialised environment that requires tightly controlled conditions for sensitive live inventory, creating a substantial and consistent baseload. This is further compounded by typical retail energy drivers such as comfort HVAC, long opening hours and continuous lighting, resulting in persistently high electricity demand.

To manage these costs, the retailer invested in a 150 kWp solar PV system to reduce reliance on grid electricity. However, even with onsite generation, overall consumption remains high due to the continuous operation of essential systems.

The client also plans to install EV charging stations to attract more visitors and generate supplementary revenue, adding to the site's overall energy requirements. Together, these factors contribute to annual consumption exceeding 550,000 kWh.

Recognising the need for a more effective and intelligent approach to energy cost reduction that would support sustainable growth and business expansion, the retailer turned to Vilion and Q Energy for innovative energy management solutions.

Outcomes/Solution



Vilion and Q Energy jointly delivered a fully managed Smart Battery Tariff designed to deliver guaranteed cost savings, maintain long-term budget predictability, and provide flexibility for additional performance-based rewards beyond a fixed tariff.

The solution provides the client with a guaranteed unit rate set 3p/kWh below the best available fixed tariff, supported by Q Energy's AI-driven optimisation and the Vilion's 50 kW / 107 kWh EnerArk Battery Energy Storage System. By switching to a flexible tariff from trusted energy supplier partners, the retailer enables Q Energy to trade on the wholesale market on its behalf. Q Energy's AI system forecasts the site's consumption every half hour and executes trading decisions in response to on-site demand and wholesale price movements. The platform also controls the battery to charge during lower-cost periods and discharge during peak-price intervals.

Because the site does not benefit from a solar export tariff, a key objective is to minimise solar waste. Through close collaboration, Vilion and Q Energy integrated the battery with the existing 150 kWp solar PV system, enabling the platform to forecast solar generation using meteorological data and dynamically adjust battery charge levels. This ensures excess solar energy is captured rather than curtailed, maximising on-site solar self-consumption and strengthening the overall value of the retailer's renewable assets.

Over the three-year contract term, the programme is projected to deliver £24,466 in guaranteed savings, strengthening the retailer's financial resilience. In the first operating quarter, the system recorded £8,737 in savings compared to best available fixed tariff rates, including both guaranteed and bonus performance savings.

Separately, the EV chargers benefit from the Smart Battery Tariff's reduced unit rate, lowering the energy cost per kWh and increasing profit margin on every charging session.

Local Benefit

The project delivers substantial operational advantages by maximising the site's solar self-sufficiency and making fuller use of clean on-site generation. By pairing the existing 150 kWp solar array with battery storage and optimisation technology, more daytime solar energy is captured and used within the store, reducing waste and lowering reliance on grid electricity.

The battery system also enables effective load shifting, allowing the store to avoid drawing power during expensive, carbon-intensive periods by discharging stored energy instead. This reduces peak loads, cuts operational costs, and meaningfully lowers the site's carbon emissions. In addition, supplying the newly installed EV chargers through a reduced-cost tariff enhances the store's commercial offering and provides a more convenient experience for visitors.

Community

The project supports Bedfordshire's 2030 carbon-neutral goal by increasing the use of locally generated renewable electricity and reducing overall demand on the regional grid. The investment also raises sustainability awareness among nearby organisations, demonstrating how local businesses can adopt practical and commercially viable low-carbon technologies.



Learn more about what's happening at [Vilion](#) and [Q Energy](#).



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