

**READY TO TRANSFORM
YOUR ENERGY COSTS
WITH ENERGY STORAGE?**



CONNECTED
ENERGY

-STOR

WORLD LEADING + AWARD WINNING

Our award-winning British-designed energy storage systems and optimisation expertise are rapidly changing the way industrial and commercial energy users can realise financial benefits by providing load flexibility.



Following a £multi-million R&D programme, the E-STOR technology uses second-life electric vehicle (EV) batteries to deliver smart, affordable and flexible energy storage systems and projects.

We optimise E-STOR systems using our sophisticated operating software and load management services to maximise the potential for efficiencies and savings.

The benefits:

Modular	Scalable systems meet your specific site needs
Integrated	Integrated hardware and software provide everything you need in one box
Containerised	Easy and low-cost to install (and relocate as required)
Resilient	Autonomous operation provides resilience; operation continues even if site communications fail, or if part of the system requires maintenance
Flexible	Capable of providing grid services, peak shaving, time-shifting, optimising on-site renewables or any combination of these
Low cost	Integral second-life electric vehicle batteries offer a lower cost, more flexible and sustainable system
Extra safe	Due to the use of OEM safety systems embedded in the batteries and battery management systems, as well as additional Connected Energy systems
Sustainable	By using second-life EV batteries, we extend their life, making better use of their embedded carbon and energy; maximising the use of finite natural resources; improving the economics and sustainability of stationary energy storage systems as well as the original electric vehicles
Proven	Systems operational in the UK, Belgium, Germany and the Netherlands have demonstrated consistent reliability since 2014

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Connected Energy Technical Centre
Unit 12 - Hethel Engineering Centre
Chapman Way, Hethel, Norfolk NR14 8FB

SOFTWARE + SERVICES

Our E-STOR energy storage systems use sophisticated control and operating software.



Together, our software and services enable you to maximise the value of the system and your return on investment.

The full value of energy storage can only be realised if your system is continuously configured to maximise efficiency, availability and responsiveness. We work with you to ensure our technology works in harmony with your site's operating characteristics.

The benefits:

Cloud-based	Personalised access to our unique cloud-based back office enables you to monitor the performance of your system and adapts the operating parameters as either your energy tariffs, or site operations, change
Comprehensive	<p>Comprehensive data systems enable easy access to detailed real time and historical operating information to support commercial, operational and maintenance decisions</p> <p>These data systems also enable our operations team to track and analyse system performance to optimise operation and pre-emptive maintenance</p>
Site-based control	Our systems can be configured to integrate with building management systems or respond to other metered assets such as pumps, Solar PV or EV chargers
Responsive	A scheduler enables the creation of a hierarchy of operating rules that enable the system to respond to electricity tariff structures, on-site generation, grid constraints, peak loads etc in a predetermined order of priority
Revenue maximised	Straight-forward integration with demand response aggregators and virtual power plants enables revenue streams to be maximised
Personalised	Your involvement with the system can be as little or as much as you like. If required our operations team can take full control to maximise the value of your system

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FINANCIAL FEASIBILITY & FINANCE

Energy storage could result in savings of around £2.4billion per year in 2030 for the UK electricity system, according to the most recent House of Commons briefing paper, 'Energy Storage in the UK'. Naturally this will also mean significant savings for businesses that invest in energy efficiency, energy saving and energy storage systems.

Our dedicated analysts are experts in modelling the relationships between system size, site conditions, mode of operation and the value streams. They provide clear feasibility analyses and are available to advise and guide you through your cost saving journey. Our team can also advise on any finance options that may be available for your project.

The benefits:

Feasibility	We provide an in-house Feasibility Assessment of the battery storage potential: from the behind the meter energy bill savings, to the grid service revenue streams
Expert market intelligence	Independent reviews of the market mechanisms and forward-view of market trends
Independent validation	We offer detailed savings and revenue forecasts based on independent, authoritative industry sources also used to validate forecasts provided by our aggregation partners
Established relationships	We have established relationships with demand response aggregators and other key players to ensure that your final project is straightforward to deliver and meets with your expectations
Fully-financed systems	A fully-financed Merchant Storage option is available for suitable projects. The Merchant Storage model requires no investment from the customer and is based on the returns being shared between the customer and Connected Energy. Eligibility is assessed on a project by project basis

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E-STOR ENERGY STORAGE SYSTEM

E-STOR energy storage systems are convenient containerised units designed to be installed behind the meter on industrial and commercial sites.

Assembled from a modular configuration of power electronics and batteries they can be supplied in units from 60kW upwards.

E-STOR units are provided as complete systems including site integration and operating software.

What is an E-STOR system?

E-STOR energy storage systems are designed to enable sites to maximise revenue streams and minimise costs.

They can be operated by virtual power plants or demand response aggregators, or they can be operated in conjunction with other site assets – or both.

E-STOR systems can be operated to peak shave, optimise on-site renewables, manage grid constraints, respond to electricity cost differentials or provide grid services.

How is an E-STOR system controlled?

E-STOR systems are provided with comprehensive operating software and a cloud based back office enabling operating conditions to be set remotely.

Data can also be collected in support of operation and maintenance, financial reporting and the optimisation of system performance and efficiency.

Connected Energy's in-house team can provide guidance on how to best configure and operate a system for your site.

Why opt for an E-STOR system?

A higher degree of operating flexibility offered by E-STOR systems can result in greater financial returns than those offered by traditional energy storage systems.

E-STOR systems are robust and sustainable. Using multiple inverters, battery packs and autonomous control, they have inbuilt resilience. If there is a component failure or if the local grid or communications network fails, E-STOR systems continue to function according to pre-set conditions.

Utilising second life electric vehicle batteries, E-STOR systems make better use of embedded carbon, energy and finite resources involved in the manufacture of electric vehicle batteries.

Capitalising on the advanced safety systems inherent in the OEM batteries as well as additional in-house systems, E-STOR technology is exceptionally safe.



EXAMPLE E-STOR CONFIGURATIONS

	E-STOR 60/90	E-STOR 150/90	E-STOR 150/180	E-STOR 300/360	E-STOR 450/540	E-STOR 600/720
Applications	Site load management On-site renewable optimisation Site capacity reinforcement Voltage support Grid services					
Active Power (charge/discharge)	60 kW	150 kW	150 kW	300 kW	450 kW	600 kW
Apparent Power	60k VA	150 kVA	150 kVA	300 kVA	450 kVA	600 kVA
Energy (nominal at 1C rate)	90 kWh	90 kWh	180 kWh	360 kWh	540 kWh	720 kWh
Rated AC Current at 400V	87A	217A	217A	433A	650A	866A
Connection Voltage (3P)	400VAC +10%/-6%					
Frequency	50Hz					
Minimum Battery Voltage	310VDC	620VDC				
Maximum Battery Voltage	410VDC	820VDC				
Harmonic Distortion	< 3% at rated power, (at short circuit power > 40MVA)					
Power Electronics Round Trip Efficiency	≥95% at rated power (at optimum usage)					
Enclosure Type	Steel shipping container					
Enclosure Protection	IP64/5					
Ambient Temperature	-10 °C to +30 °C					
Altitude	< 1000 m (power derating may be applied at greater altitudes)					
Key components	Modular batteries & integral battery management systems Bi-directional battery charger(s) Isolation transformer Power control module AC Protection DC Protection HMI, router & communication interface					
Control	Customer & Aggregator interface portal					
EV Charging Interface (optional)	Open Charge Point Protocol (OCPP) via local area network to charge point					
Grid/LV Interface	G59/3 compliant relay					
Supporting Management System	Connected Energy Management Platform					
Weight (inc batteries)	4,659 kg	5,900kg	9,715kg	16,013 kg	2 x 12,864 kg	2 x 16,013 kg
Dimensions	Length: 3,445 mm Width: 2,438 mm Height: 2,591 mm	Length: 3,445 mm Width: 2,438 mm Height: 2,896 mm	Length: 6,512 mm Width: 2,438 mm Height: 2,896 mm	Length: 6,512 mm Width: 2,438 mm Height: 2,896 mm	Length: 6,512 mm Width: 2,438 mm Height: 2,896 mm	Length: 6,512 mm Width: 2,438 mm Height: 2,896 mm

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