

Enabling heavy-duty electric vehicle charging infrastructure through second life battery energy storage technology

Presentation by:
Nigel Dent, Head of Sales

**15 years
of innovation.**

**2 major environmental
challenges solved.**

- Reliable storage
for renewable energy
- An efficient second use of electric vehicle
batteries



E-STOR battery system

- Modular and scalable in design
- 300kW / 360kWh system
- Made from second life Renault battery packs
- 20' container
- Easy to install and manage
- Used as an individual system or multiple battery systems can be linked together.



Our product

Forthcoming developments

- 2MW / 4MWh systems
- Capable of combined power of up to 10MW
- Available in 2026
- Grid services compatible
- Batteries supplied as a service option





Case Study – OEM Truck Dealership

Charging eHGV on two grid constraint sites

How to enable eHGV Charging Infrastructure

- High-capacity chargers require up to 50xs the power of car and van infrastructure
- Most traditional fleet infrastructure was not built for such high energy use
- Our modelling for the eHGV sector showed that in the majority of cases, the local grid could not support high-powered charging
- What are the options?



Upgrade the local grid capacity

Costly

Long lead-in times: sometimes up to 5 years

Land ownership complexity

Sometimes impossible

Battery energy storage with dynamic load management

More cost-effective

Quicker

Sustainable: linked to solar or cleaner grid power

Potential to generate additional revenue





Dealership
and service
centres



High powered
charging



Power:
300kW



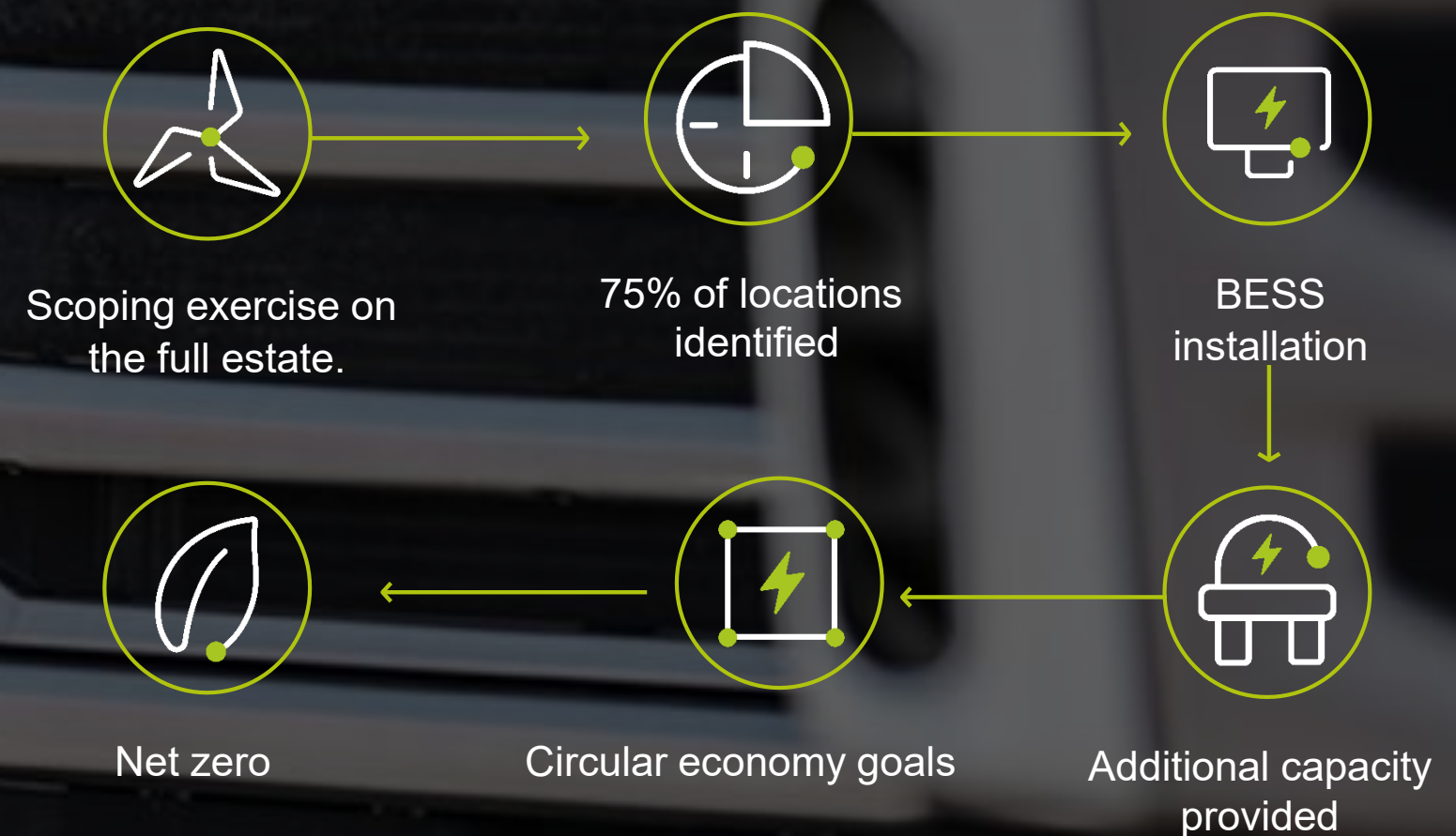
Capacity:
360kWh

OEM truck dealership

OEM Truck and bus dealerships in the UK lacked the capacity to install **high powered charge points** at their dealership and service centres.

Connected Energy's **battery storage system** helped to overcome the **challenge** of their grid constraints.

Allowing them to install the EV charging infrastructure they required without upgrades.



Site 1 challenge – powering a new 350kW truck charger

Site Name	Import capacity (kW)	Site Peak load (kW)	EV chargers (No.)	EV Chargers (kW)	Totals (kW)
Site 1	122	60			60
			5	44	220
			1	350	350
Totals	122				630

Site 1 solution with a BESS

Site Name	Import capacity (kW)	Existing Site Peak load (kW)	Additional EV charger site load (kW)	Total potential site load (kW)	Total site capacity (kW)
Site 1	122	60		60	122
			220	220	
			350	350	
E-STOR	300				300
Totals	122		570	630	422



Site 2 challenge – powering a new 150kW truck charger

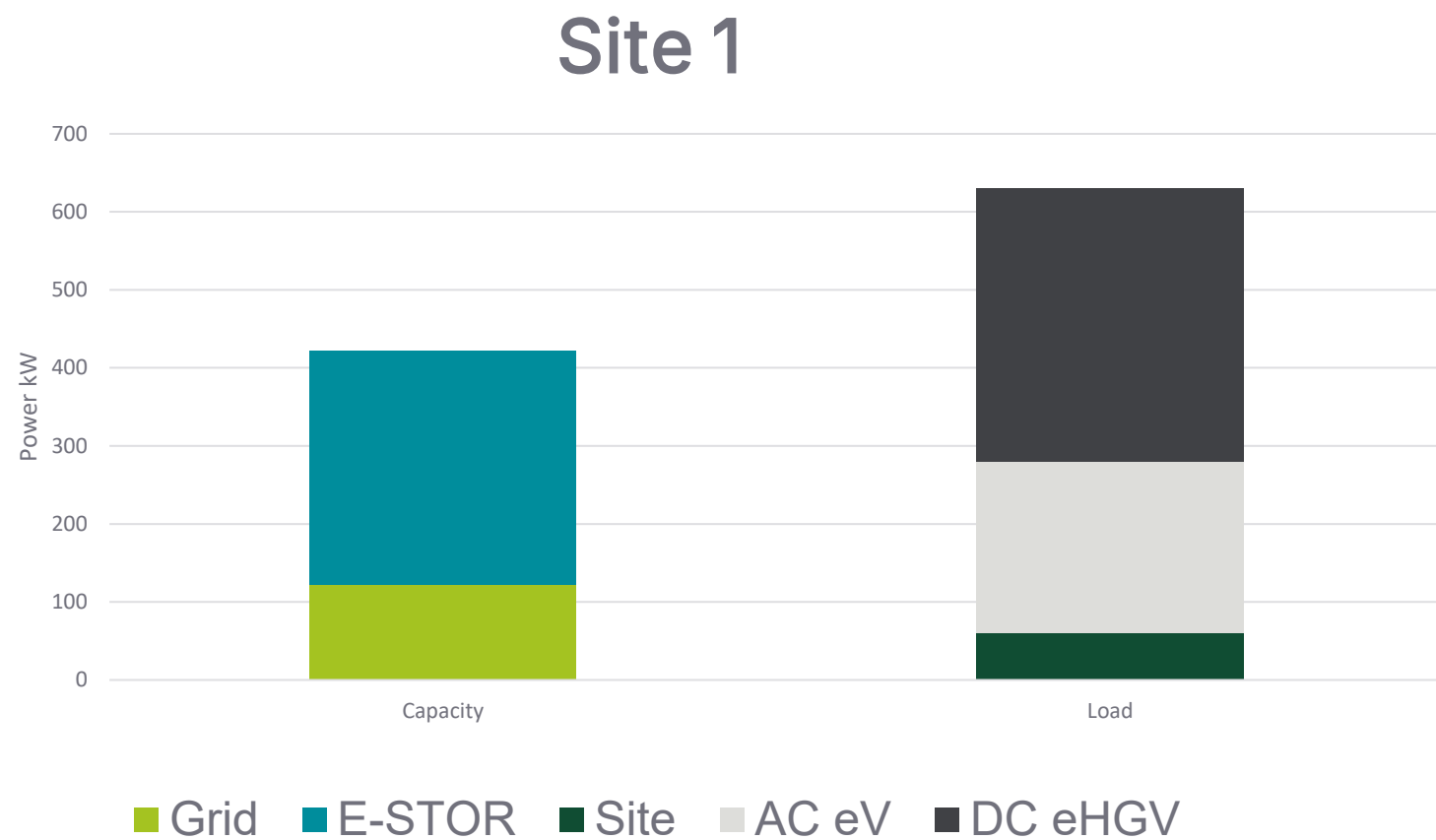
Site Name	Import capacity (kW)	Site Peak load (kW)	EV chargers (No.)	EV Chargers (kW)	Totals (kW)
Site 2	220	65			65
			2	44	88
			1	150	150
Totals	220				303

Site 2 solution with a BESS

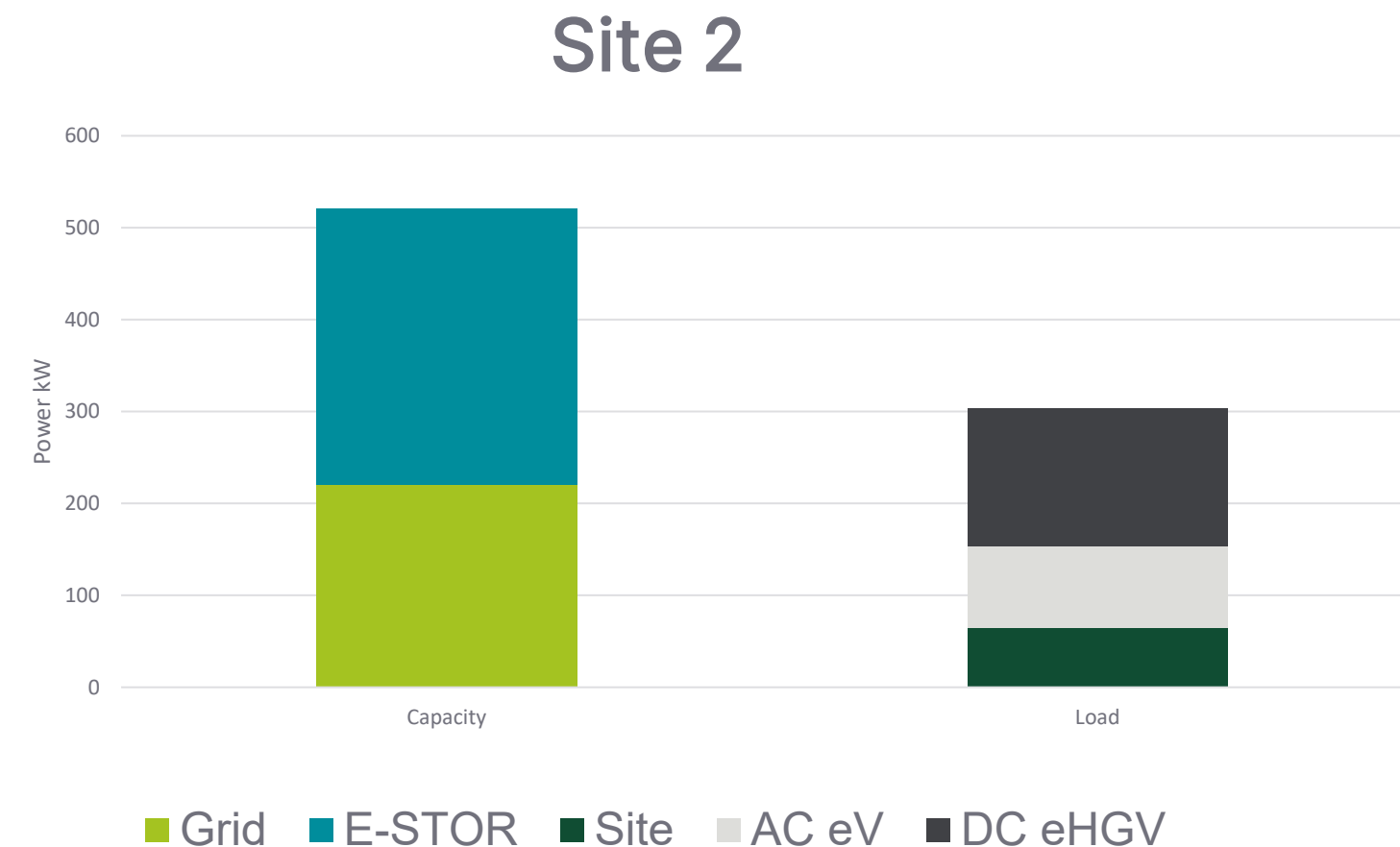
Site Name	Import capacity (kW)	Site Peak load (kW)	Additional EV charger site load (kW)	Total potential site load (kW)	Total site capacity (kW)
Site 2	220	65		65	220
			88	88	
			150	150	
E-STOR	300				300
Totals	220			303	520



BESS supporting new EV charging load



- Total potential load: **630kW** on a **122kW** grid supply
- BESS takes total available capacity to **422kW**
- BESS communicates total available power to EV Charge Point Dynamic Load Management systems with PLD operating as a safety device to avoid overloading the supply.
- Systems configured to prioritise the 350kW eHGV charge point over the AC EV charge points.



- Total potential load of **303kW** on a **220kW** grid supply
- BESS takes the total available capacity to **520kW**
- BESS communicates total available power to EV Charge Point Dynamic Load Management systems with PLD operating as a safety device to avoid overloading the supply.

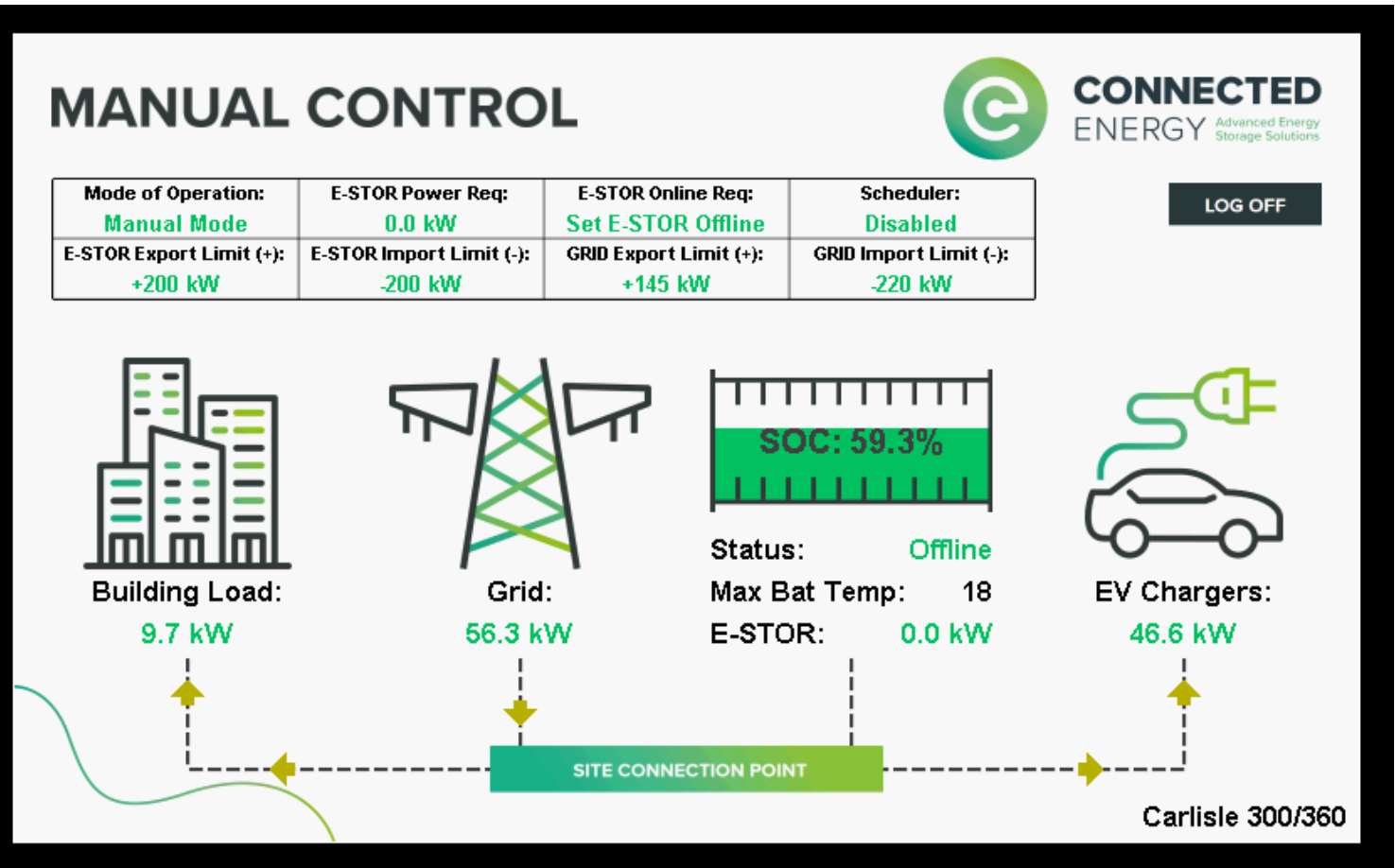
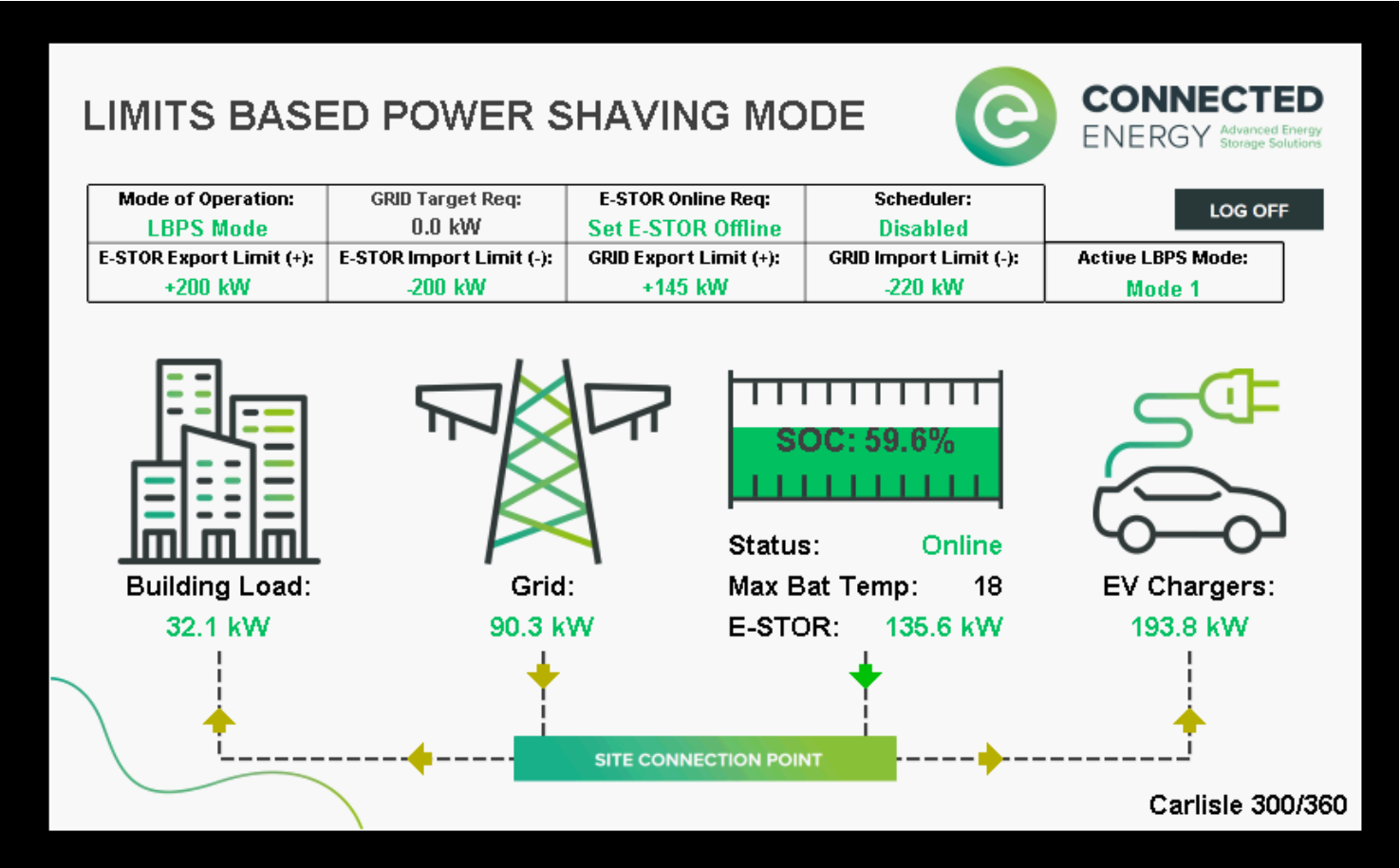
Dynamic Load Management (DLM)

Operation example – 200kW EV charging load

- BESS software set to target a limit to incoming site power of 100kW
- Maximum EV Charge Point load set at 250kW
- Hard limits maintained by Power Limitation Device (PLD)
- Real time measurement of incoming power by metering within PLD, data feed to BESS controller
- Total load is 225.9KW, above MIC of 220kW
- BESS will charge when total load <80kW

Operation example – 50kW EV charger load

- EV CP has been manually limited to 50kW max from BESS to DLM
- EV CP has responded to drop power below limit



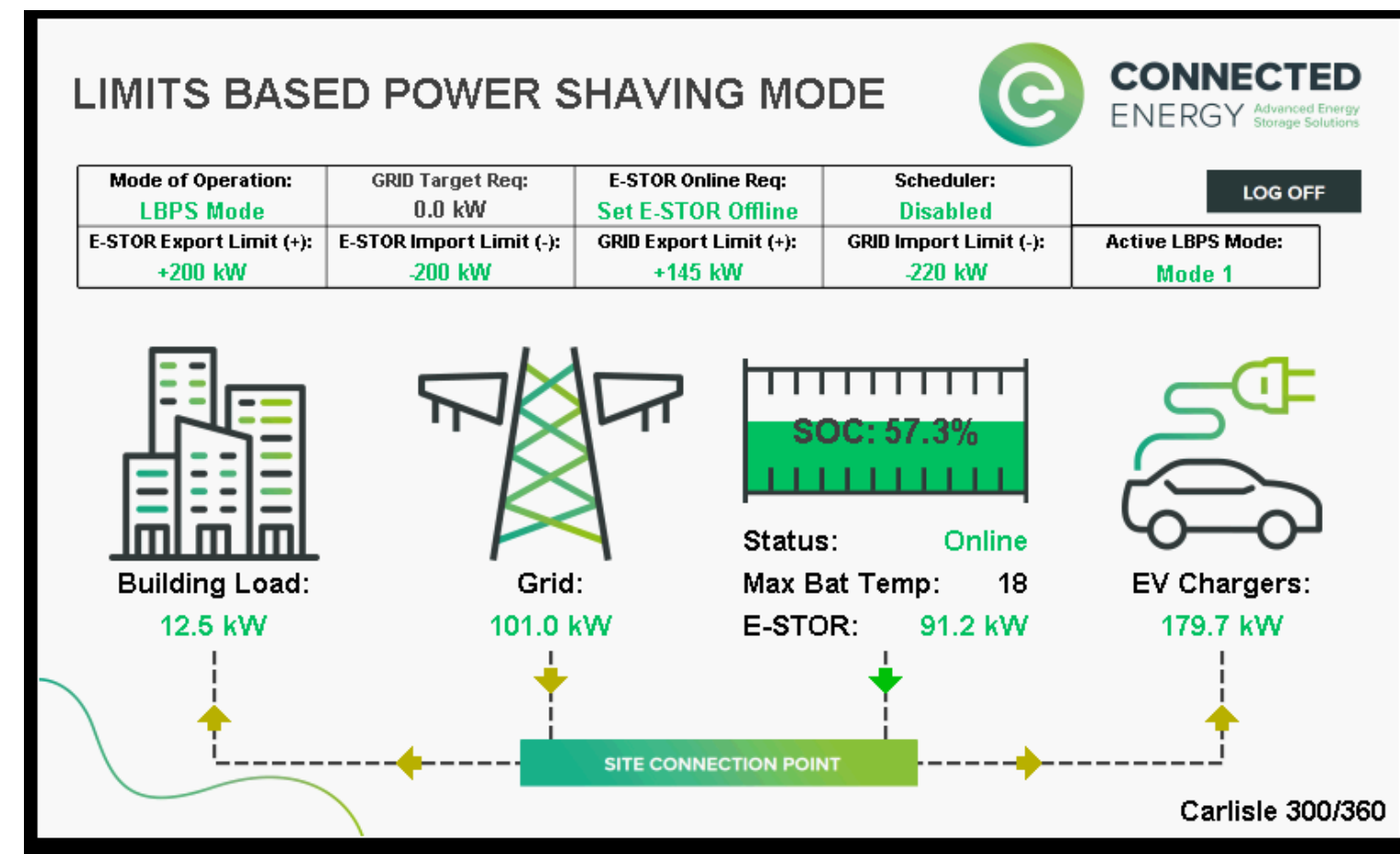
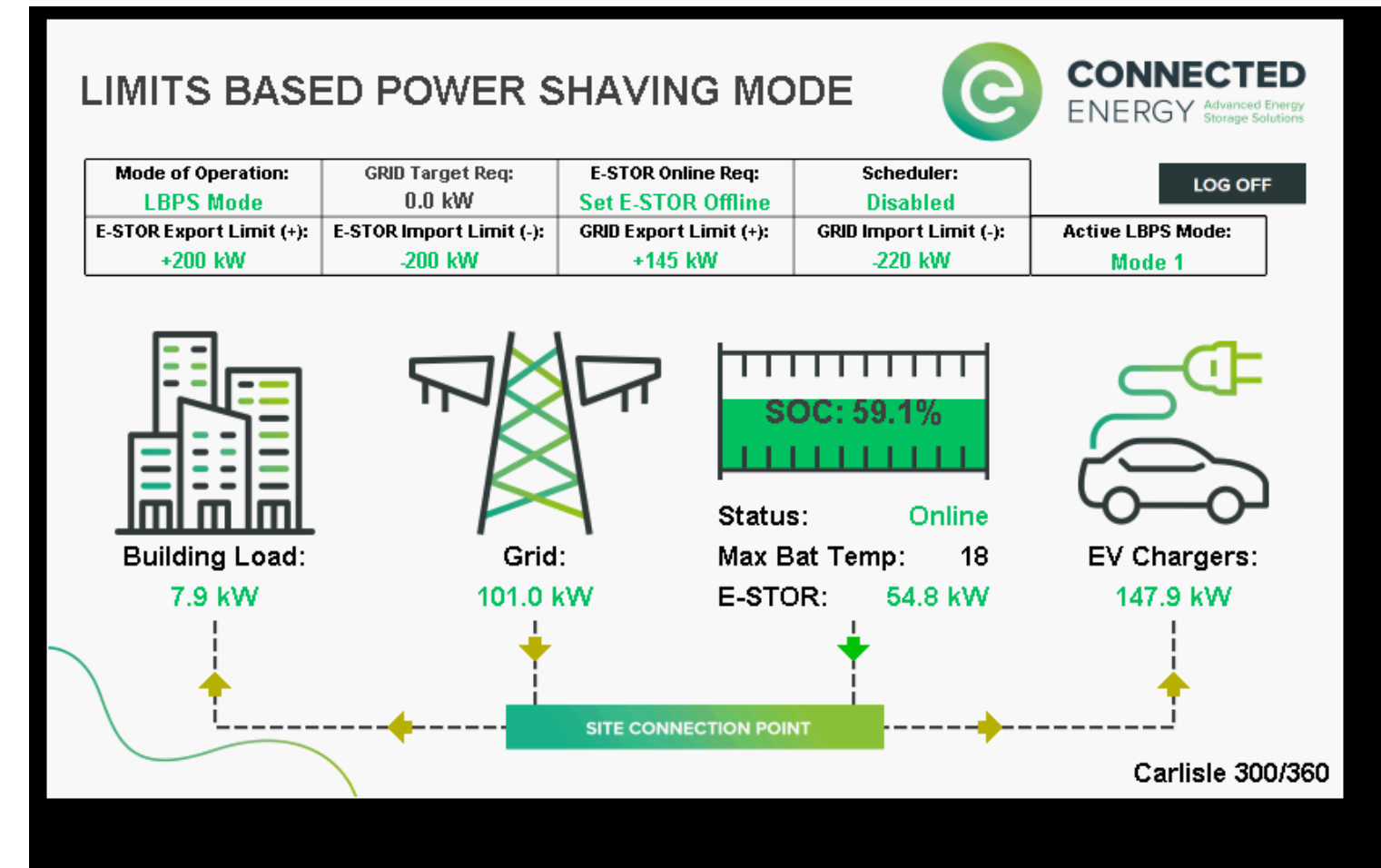
EV charger support

Operation example – grid import target limit 100kW

- Automatic control returns EV CP limit to 250kW
- CP load ramps up
- Grid import targets 100kW maximum

Operation example – EV charger demand increases

- CP load ramps up further
- Grid import continues to target 100kW maximum
- BESS supports the increasing load



Case Study Summary

- 2 OEM sites have E-STOR BESS installed.
- **Site 1** - Without the E-STOR installed the 350kW charger would not have enough available power anytime during 24hrs.
- **Site 2** – Without the E-STOR installed the 150kW charger would not have enough available power during the daytime with the 60kW site load.
- Dynamic load management at both sites gives priority to the eHGV high powered EV chargers.
- **Grid Services** – both of these sites could benefit from an additional £15k - £20k of demand flexibility grid service revenues.
- The two sites are utilising 48x Renault Kangoo batteries, previously used in a vehicle, and thus providing a positive carbon benefit over a 1st life system.



BESS in action



Truck depot: Europe

Grid import connection: limited to 100kW
Charger requirement: 300kW

- Power delivered by the BESS
- Power delivered from the grid

By using the battery to deliver the difference in power needed we're stopping the site from going over its limit, enabling trucks to charge as they need. As soon as a truck stops charging, the system reverts to charging from the grid, ready for the next vehicle.

Want to find out more?

Latest whitepaper

www.connected-energy.co.uk/ev-whitepaper

Calculate your own site

www.connected-energy.co.uk/ev-calculator



The role of battery energy storage in powering the next generation of high-powered EV charging

A whitepaper

Download today





EV charging and battery energy storage calculator

Get more power for your charge

Be it for a fleet depot, charging hub, EV dealership, or workplace, battery energy storage can support EV charging. Our systems can help to reduce the need for grid upgrades and help to manage peak demand so that you can get the power you need for EV charging at the speed and scale required.

By completing this form with your EV charging requirements, we can calculate whether a BESS could be right for your site and requirements, helping to overcome some of the key barriers to charge point deployment.

Start >





Connected
Energy



British innovation,
with global reach.

Connect with
us:



0191 495 7321



[www.connected-
energy.co.uk](http://www.connected-energy.co.uk)



[info@connected-
energy.co.uk](mailto:info@connected-energy.co.uk)



HQ

The Core, Bath Lane
Newcastle Helix
Newcastle upon
Tyne NE4 5TF

Technical

Centre Unit 30 -

32

Hethel Engineering
Centre Chapman Way,
Hethel Norfolk NR14 8FB