

Batteries need Batteries



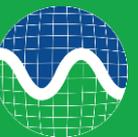
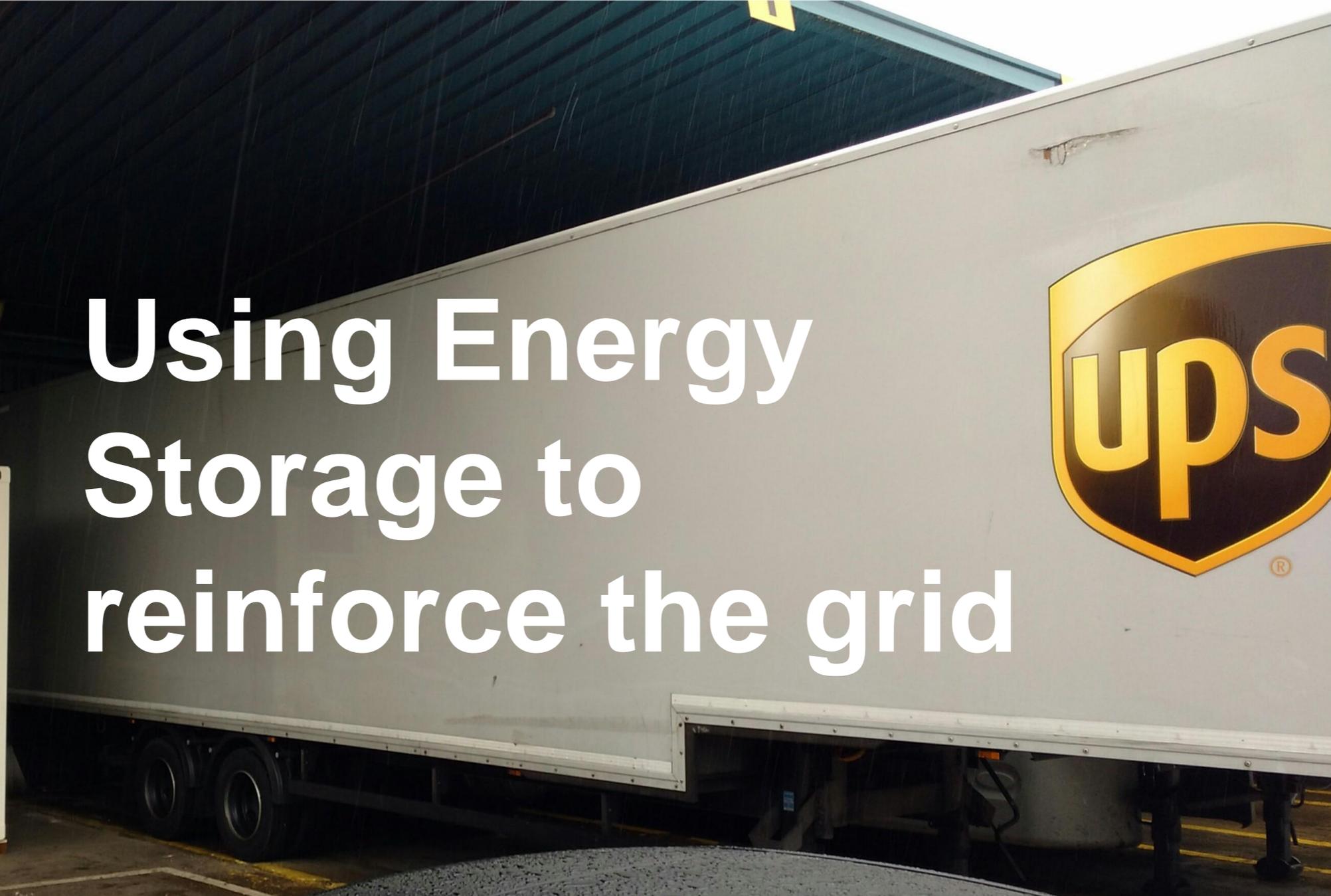
The case for Energy Storage in EV charging infrastructure



Case Study: UPS Camden



Using Energy Storage to reinforce the grid



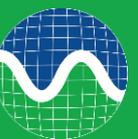
Infrastructure Challenges

What if an upgrade is too expensive, takes too long or not possible?



Power vs Energy.....

The role of battery energy storage.



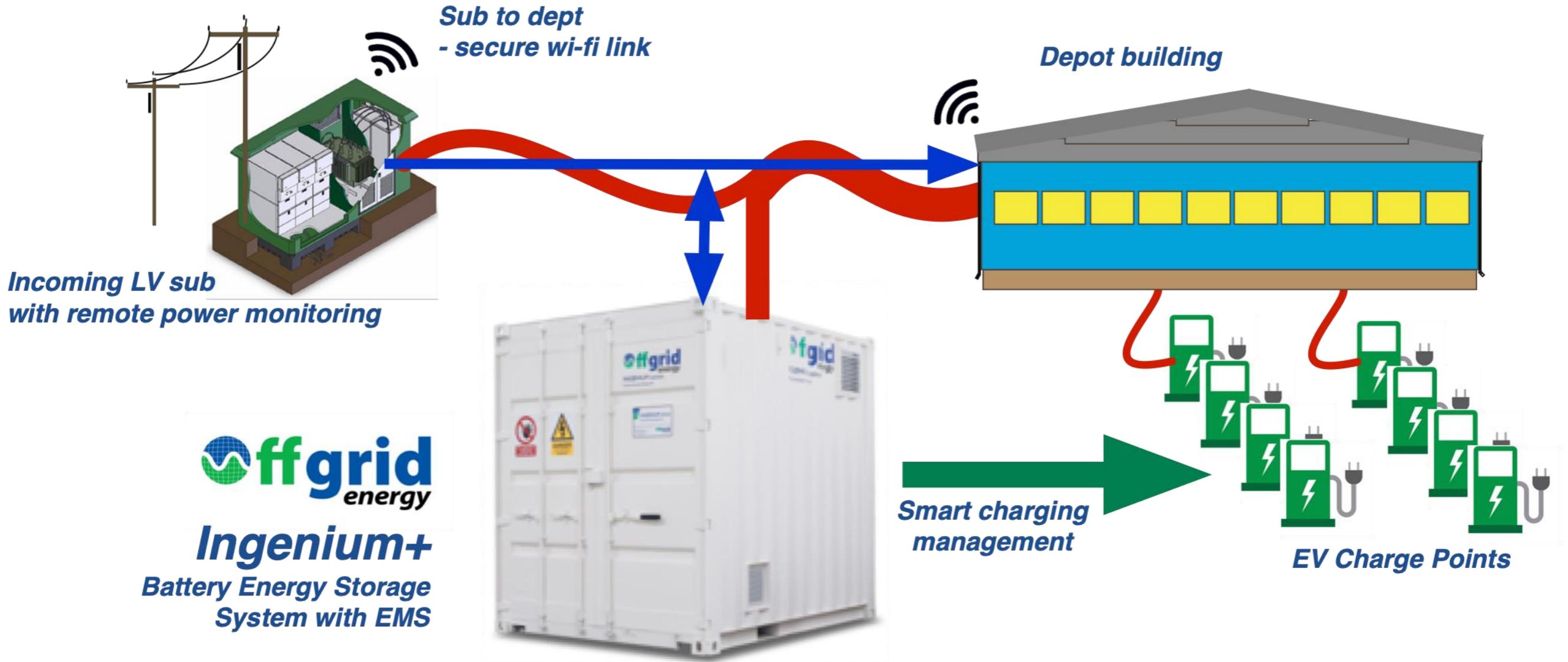
Camden: The challenges



- UPS ambition to fully electrify Camden depot supported by GLA and Cross River Partnership, motivated by introduction of ULEZ.
- 170 all electric vans each potentially charging at 22kW
- Worst case increase in power demand of +4MW
- Cost for grid re-enforcement £Millions & years planning and implementation.
- Issues with constrained local grid capacity

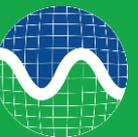


Storage + Smart Charging



Ingenium+

Battery Energy Storage
System with EMS

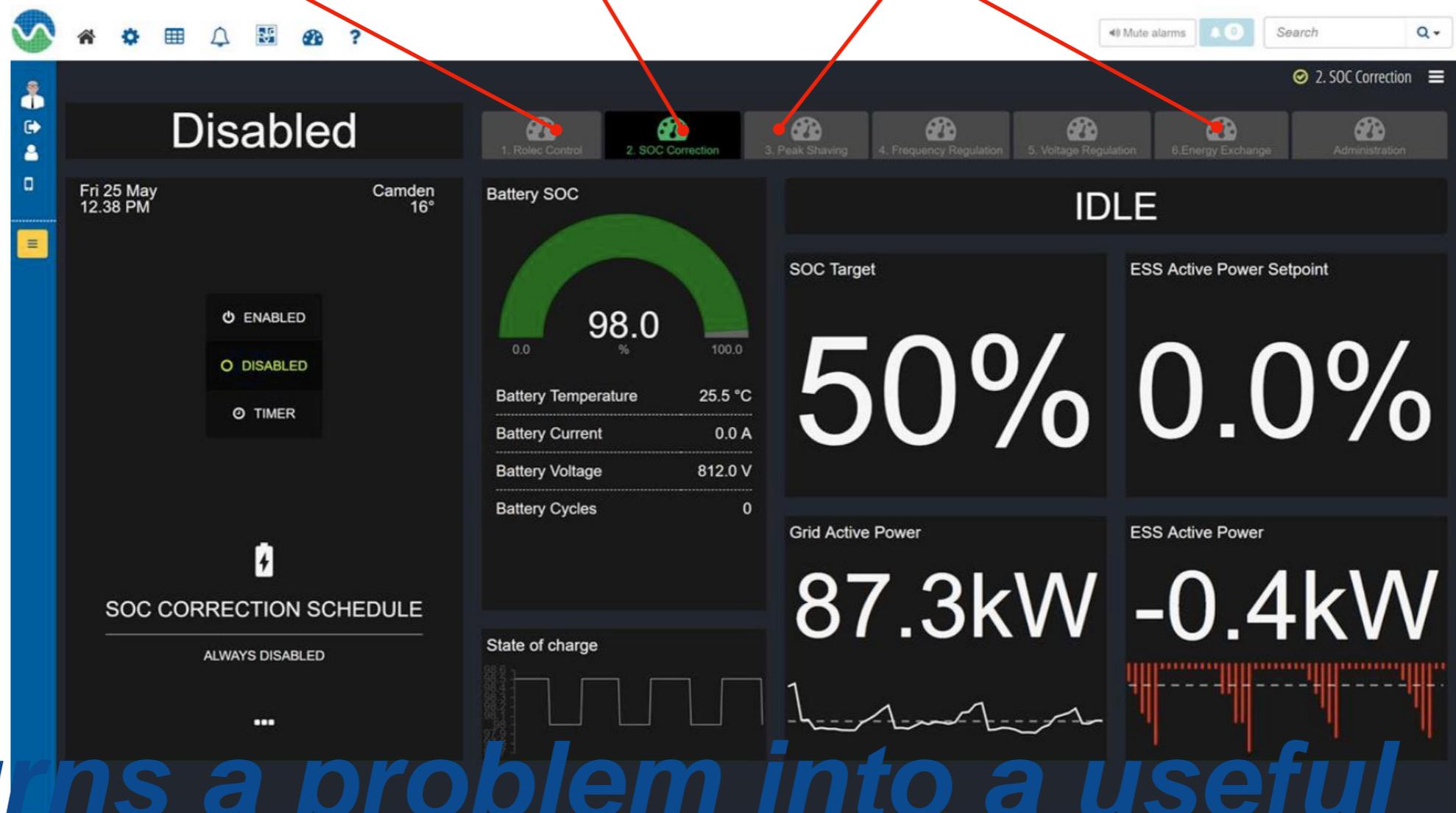


Operating modes:

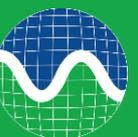
SoC correction

Depot control

Network control



Turns a problem into a useful asset.



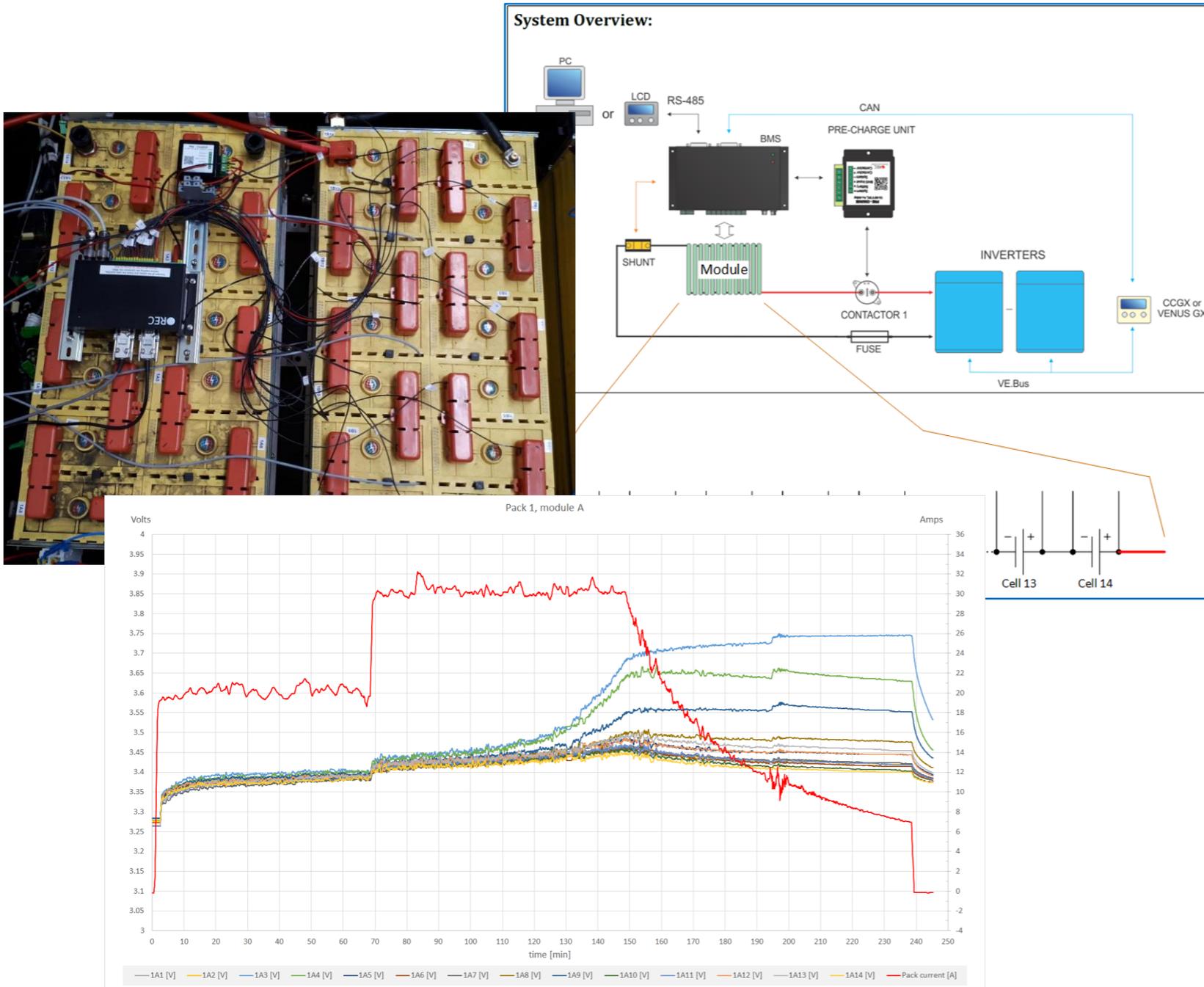
Benefits:

- **Delivered with 16 weeks**
- **Lower cost**
- **Customer's asset rather than a sunken cost**
- **Can be used for grid support services (useful to DNO)**
- **Option to self consume renewables**

Turns a problem into a useful asset.



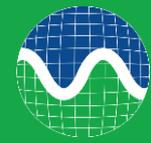
Battery 2nd Use



- **Asses**
- **Reprocess**
- **Re-Build**



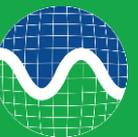
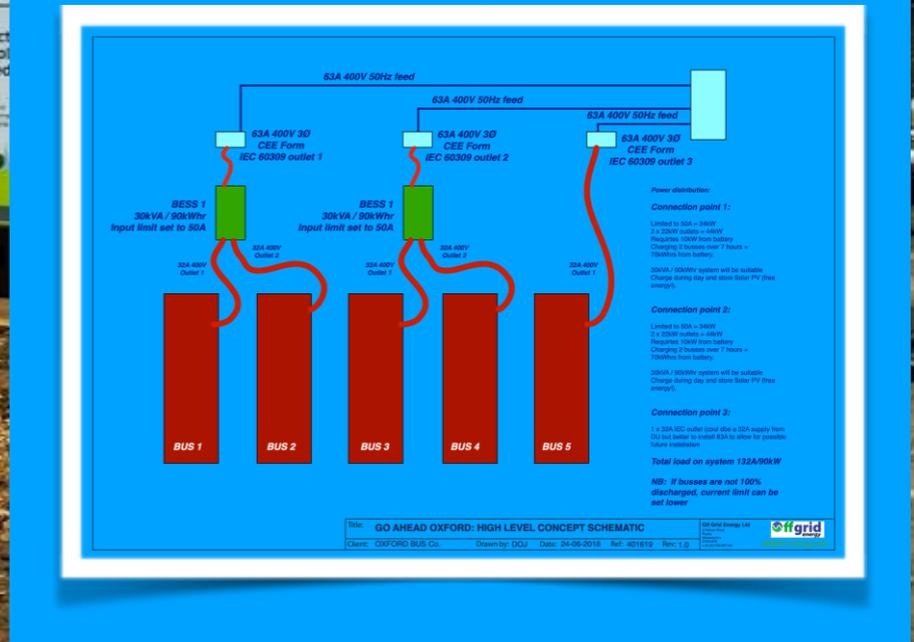
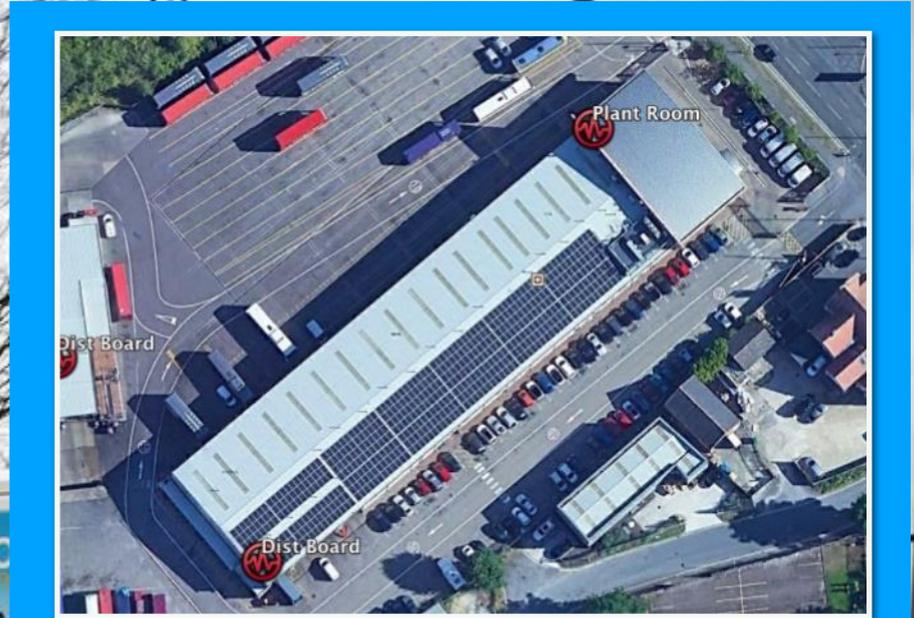
W.
**FULLY
CHARGED**
SHOW



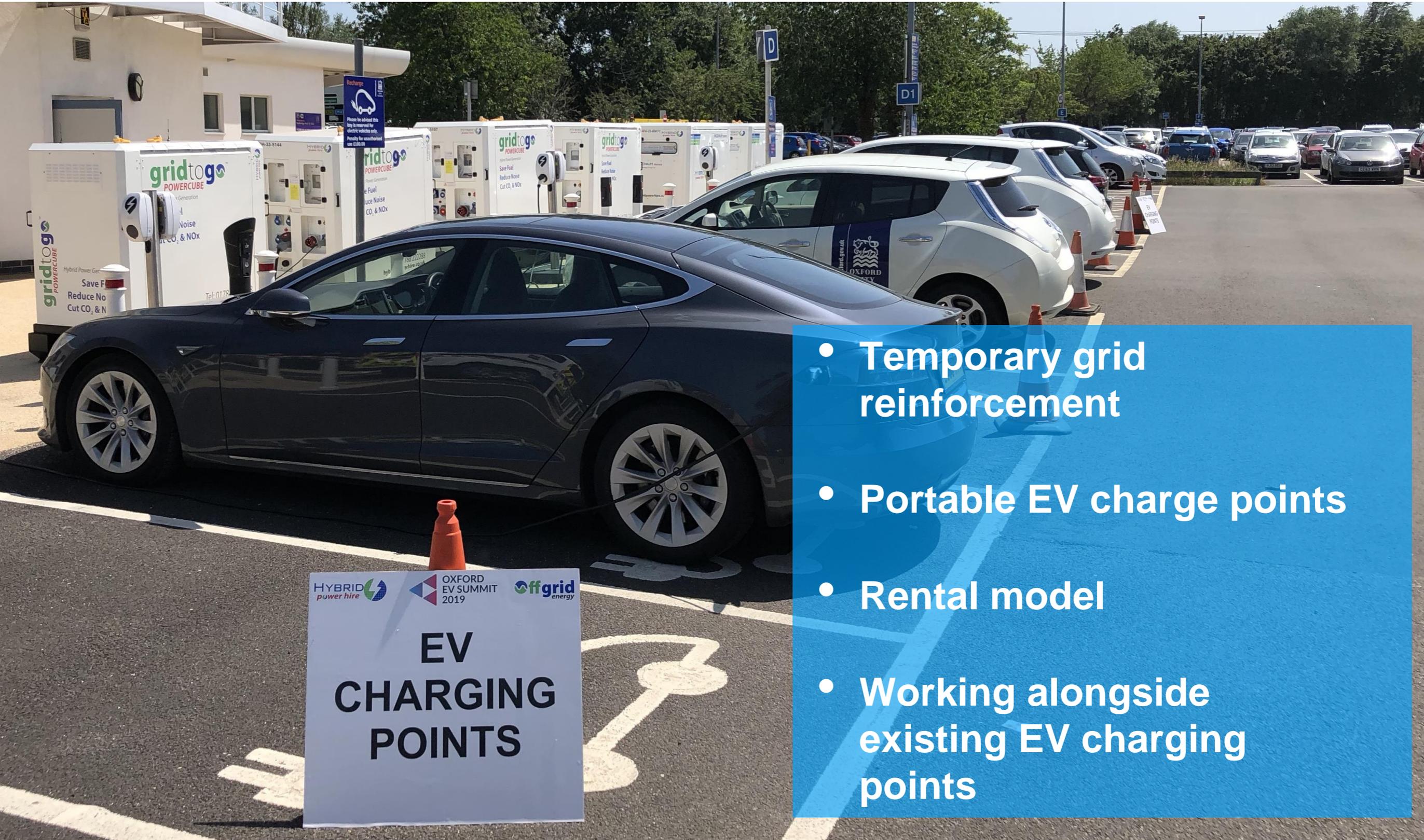
Case Study: Oxford Bus



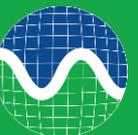
- Alternative to new connection
- Transferable asset
- PV self consumption
- Energy Exchange
- Intermediate solution



Case Study: Oxford EV Summit



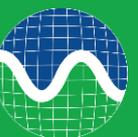
- Temporary grid reinforcement
- Portable EV charge points
- Rental model
- Working alongside existing EV charging points



Case Study: EV launch event



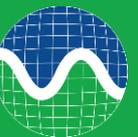
- Provision of temporary infrastructure at remote venue
- Stored capacity and power output modelled to suit event profile
- Zero emissions, no noise, no pollution



Case Study: EV Assist



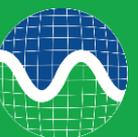
- **Mobile storage: Roadside and valet charging services**



Conclusions

Making storage cost effective

- **Short lead time**
- **Lower cost than reinforcement/new connection**
- **Integrate with smart charging and other technologies**
- **Self consumption of on-site generation**
- **Energy exchange**
- **Load shift / peak lopping**
- **Revenue generation**
- **Asset on balance sheet rather than sunken cost**





Thank you!

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