

New Power

REPORT

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MATTHEW RHODES, ENERGY CAPITAL

'By the time BEIS and Ofgem get there, our innovators will have lost the opportunity'



WHO CONTROLS ENERGY?



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It's about financial management, not energy

SUPPLY OPTIONS

Bypassing the supplier hub?

'Perhaps one of the new behaviours of the ESO is being more transparent'

*Charlotte Ramsay,
programme director, future role of
the system operator, National Grid*

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DANNY JONES, OFF-GRID ENERGY

'Suddenly, big automotive players are wondering whether they are part of the energy system'

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Diesel fuels power control

Danny Jones explains to Janet Wood how getting the most out of temporary power supplies has provided control technologies for the EV rollout

Despite its name, Off-Grid Energy had to do some rapid rethinking when Ofgem started to look at network charges. The company was supplying temporary or permanent storage that would help users make much more efficient use of existing on-site generators – often diesel engines – or expand their operations without having to upgrade their network connections.

Company founder Danny Jones says: “We had been talking to a non-electric utility that is a big electricity consumer. Just to take one component, how Triad affects them... with that change, it went out of the window. There are other considerations for this customer, but now we have to go back to the drawing board and think about different ways it can work for them. Were we in a position where that was a big part of our business, it would be a worry.”

I ask about other changes, such as making network company “red band” peak charges lower, and the combined effect on storage. Jones says: “It takes away an enormous opportunity. “If we want storage to deal with the technical challenges of balancing the grid, one of the things that makes that work is having the right financial instruments in place. I am a bit perplexed as to where that is going.” He says the Triad was “enormously effective... you take that away and I’m not sure what that is achieving”.

For Off-Grid Energy, plans to change the charging regime came as the company was considering how to invest and grow the business. The company had started by helping customers off the grid – often in agriculture – who were running diesel generators. The feed-in tariff made the difference: “Many of the customers we worked with in past days [when the tariff was 47p] are still making a profit on the feed-in tariff,” Jones says.

The company’s direction changed when Jones had an inspiration on temporary power during a Sunday motorway journey where he saw 13 diesel generators “with the flaps up on the exhaust, so I knew they were generating” but to almost no purpose. He saw that by using storage, “there was something to gain in cost savings but also environmental benefits”.

Off-Grid Energy now uses mobile battery storage and control systems, in the form of its Grid to Go packages, to manage temporary power. With that option, engines can be operated at optimum load and grid connections can be used more effectively. But Jones found it was hard to get traction in the established temporary power sector: “The users have no idea what their real power needs are – whether it is a construction site or a festival. They take the advice of the industry, they rent a generator and they don’t get feedback about how much power they have used.”

That has begun to change, not least because people like Jones have been “banging the drum”. But he adds, “the voice of the sustainability teams has got louder at board level” and, crucially, there is legislation – on air quality, not necessarily carbon emissions – to back change.

For example, London hosts half the UK’s construction, often run on diesel generators driving compressors, pumps and cranes. They are “mostly running old, poorly maintained, very dirty generators”, says Jones.

New GLA zero-emission zones for non-road engines will mean cleaner machines – but the new ones will also be “bigger, heavier and less fuel-efficient”. They have to be replaced – or, at least, run in the most efficient way. Temporary power – for other users, like festivals, as well as construction – is one space where control and storage can add efficiency.

Another use is managing an “undersized” connection. Jones gives construction as an example again, where “you get a temporary power supply from another building but it may give you less power than you wanted. We can make sure the supply is pegged at the capacity of the connection and use the energy >



“The risk is that the whole EV thing falls on its face because customers think they can’t charge”

WHAT'S THE ALTERNATIVE TO REINFORCEMENT?

Off-Grid Energy's original business was providing reliable power for those where the cost of connection is high. That is the kind of innovation needed for local energy systems, and to avoid reinforcement of the existing grid (as Ofgem has highlighted in proposals for the next RIIO period).

But Jones says it is a market that cannot take off because there is little information. The industry has no idea of applications, and the applicants have no idea about the companies that can design an alternative. Jones says it is pot luck and he would like "a more structured way that these alternatives could be made available to people". He adds: "Lots of those people who can't get connected – or where it is too expensive – will have gone and bought a diesel generator."

in the battery to meet the peak, and we can absorb regenerative energy when a crane is dropping. The alternative is to put in a diesel generator, but [because of the effect of the regenerative energy] it has to be oversized and it runs inefficiently."

THE EV PLAY

That experience in making effective use of a limited connection is more and more important as new users connect to the grid. Jones says, for example, that there is a "growing opportunity for clean temporary charging solutions to support the introduction of electric vehicles".

Jones says the switch to EVs could proceed with some dramatic upticks. "Suddenly, big automotive players are wondering whether they are part of the energy system. It's really interesting to think where that will go." However, he warns: "The risk is that the whole EV thing falls on its face because customers think they can't charge."

In fact, it is surprising how many examples there are already where charging has to be strictly managed. Jones says: "We are looking at materials-handling depots, where they are moving to lithium-ion for vehicles – forklift trucks, for example. It makes a lot of sense, but because of the fast charging, power requirements go up. But with a bit of smart management you can often get away with a very small requirement [for extra power] to deal with the problem."

A project to enable UPS to charge all the 170 vehicles that use its London depot was an example. Jones explains: "The incoming grid supply was not enough to manage the expected peak in demand. It would have meant another million pounds and a couple of years wait for another solution [upgrading the connection]. We have supplied a containerised version [of our Grid to Go technology].

"We have a management system that can monitor consumption, the load on the substation, and what's happening in the depot and can control charging of the vehicles. We can play on that to manage the distribution of energy to the vehicles that are connected. You still get a deficit, and that's when the battery will be able to inject into the depot." Although it is connected to the site through a hole in the wall, the battery is behind the meter and is the customer's asset.

"What is interesting is its layered capability," Jones says. The depot, "is a ghost town in the day, with just admin staff, and the baseload is next to nothing". Vehicles arrive in the early evening and plug in. "Then all the conveyors start up as they are sorting the parcels. It is a hive of activity in the late evening with everything being sorted and the vehicles charged." Activity falls again in the early hours and the power demand drops, and then "we can

recharge. But in the day we can say to UK Power Networks that... we can inject energy into the network and reflect services back. Another dimension is that we can absorb energy, if it is a particularly sunny or windy day, so UKPN can use that to help regulate the network." In future, if UPS wants to install solar PV at the depot, that can be absorbed or exported where necessary too.

"Putting these layers in makes it much more financially viable than it would be if it were just a battery to support charging of the vehicles," says Jones.

That is a lesson to be learned for grid-scale storage as well, he says. There have been lots of research projects, like those supported by funding from the Low Carbon Networks and Networks Innovation. Jones says: "People have maybe jumped in quickly to try out solutions that haven't been massively sophisticated and haven't necessarily worked particularly well.

"The early stage projects were quite simplistic in terms of what they did and there was a race to do it as cheaply as possible so the cost benefits could be stacked up. Lots was driven off the back of a diminishing solar PV sector that had had its bubble, and that was a market that had got used to asking how cheaply they could do everything, rather than asking how they could exploit the technology to the full." N

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