

How to break the vicious cycle of extreme weather and energy security, whilst saving money



Keith Robertshaw

The battery storage market is expanding and domestic and community users are expected to install small-scale batteries. This is linked to coal phase out and cold waves, such as The Beast from the East. PES invited Keith Robertshaw, Business Development Director from N-ERGY Power Solutions to clarify the link and explain why the batteries market could face a boost very soon as a result.

When the Beast from The East unwelcomingly visited the UK, residents were disturbed, and some were locked up inside unable to reach their jobs.

It went beyond impacting individuals, it cost UK supermarkets £22m as shoppers made 5% fewer visits to them. The services sector was massively affected as well with Purchasing Managers' Indices hitting a 20-month bottom low in March.

Few would make the link between Beast from the East and Climate Change and some might argue that such waves have always hit the UK.

But it is scientifically proven that climate change has been affecting the severity and the rapid frequency of such events.

Extreme weather events cause major destructions on every scale, including



Electricity carbon intensity (g/kWh)

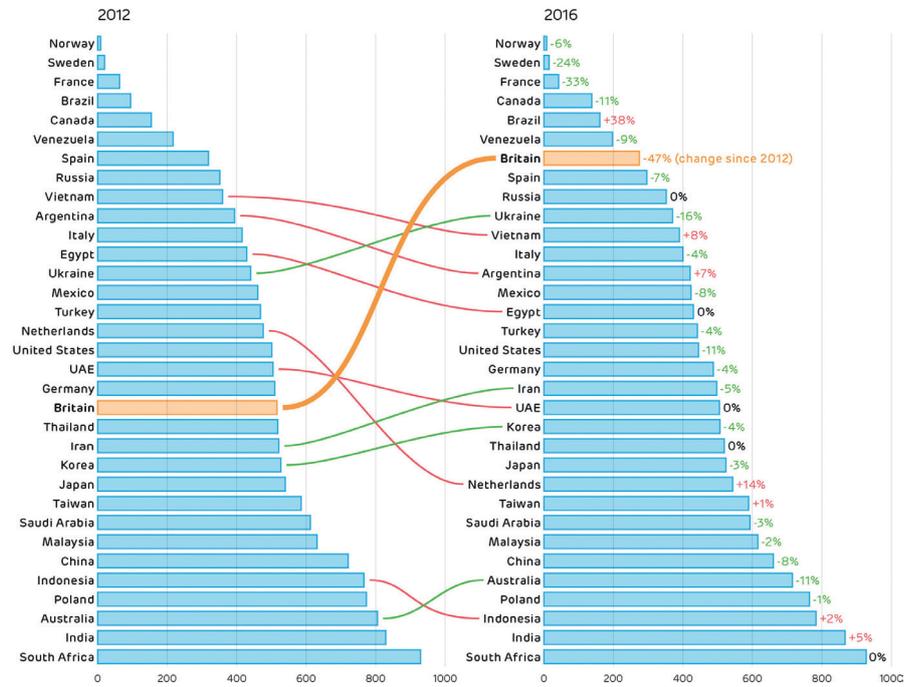


Figure 1

causing deaths. And fighting such events and climate change is an international mission. But on an individual level, people cannot survive such events without energy.

When talking about climate change, the energy sector is one of the first things that gets mentioned. It is one of the sectors that most affects climate change and one of the first sectors to get affected by it.

Commitment to lower carbon emissions through energy

One of the most prominent sectors that contribute to carbon emissions is the energy sector; The Intergovernmental Panel on Climate Change (IPCC) states that energy is responsible for two-thirds of the global anthropogenic greenhouse-gases emissions. This great contribution puts a huge weight on governments to reform the energy sector in a way to minimise carbon emissions while keeping

energy supply secure, affordable, and reliable to all customers.

UK carbon performance has improved significantly in the past three decades, with 42% of carbon emissions reduction and 67% of economic growth since 1990, according to the Clean Growth Strategy. UK's commitment to reducing carbon emissions has been fruitful and it is leading G7 countries in this regard after climbing 13 places up to be the 7th on the Carbon Power League.

Coal phase out

Almost a year ago, for the first time in 135 years, Britain has gone a full day on the 24th of April 2017 without the need of generating electricity from coal. Approximately, 8.4 GW of coal power capacity has shut down since 2010 with almost half of it happening in 2016 due to clean air legislation.

The UK aims to completely phase out from coal in 2025 and it launched a global alliance with Canada at the Conference of Parties (COP23) to gain momentum.

The two countries invited more states to join them for a complete phase out of coal by 2030. This was also open for non-state actors to join such as private sector organisations. The list had 58 actors as of the end of 2017 committed to completely stop using coal, including companies like Virgin and Unilever and sub-national governments like the State of Washington.

What is the alternative?

The UK had the greenest year in 2017 with many firsts in the energy sector with more renewables being installed in place. An accumulative capacity of 40.5 GW of renewable energy was installed in the UK with a 29.4% contribution to the total electricity generation. Wind and solar combined produced more electricity than any other moment. They produced more electricity than nuclear in 2017 (after gas which is considered a low-carbon source of energy by the EU).

Troubled alternative?

Renewable energy such as wind power, both on-shore and off-shore, and solar energy is intermittent by nature. And the problem goes beyond the cycle of day and night, when the sun is not shining or the wind is not blowing, to become a seasonal problem. Renewable energy will generate more electricity than the demand in some seasons whereas, in others, it will have minimum or no generation, according to forecasts.

This intermittency makes renewable energy a less favourable option for the government to cover the base load. But this does not mean it will stop renewables projects. The UK government has been under the pressure to create lucrative markets for even more renewables even at a higher cost.

What does this mean to UK residents?

Renewable energy intermittency can be solved by complimenting technologies and markets such as the Capacity Market and energy storage (batteries are just one example). The Capacity Market was introduced in 2014 to guarantee security in electricity supply in the cases of high demand.

An estimate of 3GW operational utility-scale storage was installed in the UK as of 2017. This number is expected to multiply in the coming few years with the renewable energy increasing capacity to meet a 15% target of the total energy mix by 2020. The domestic sector is expected to install 1kWh – 30kWh batteries whereas the commercial and industrial sectors will install 30kWh – 1MWh batteries.

Here are why these sectors should seriously consider installing battery storage at home, farm or business now:

Maximum benefit of renewable energy investment

The government has declared no subsidies will be granted to renewable energy projects before 2025 making the sector in its current form less attractive for new investors and less profitable for current ones.

The first subsidy-free solar farm had to depend on batteries to make financial sense. Farmers and households that installed AD plants, solar Photovoltaics or wind turbines tend to export almost half of their excess electricity to the grid. The current schemes have low export rates and high import rates resulting in financial losses.

Installing batteries make the point of generation is the point of consumption and this increases the profitability of renewable energy systems.

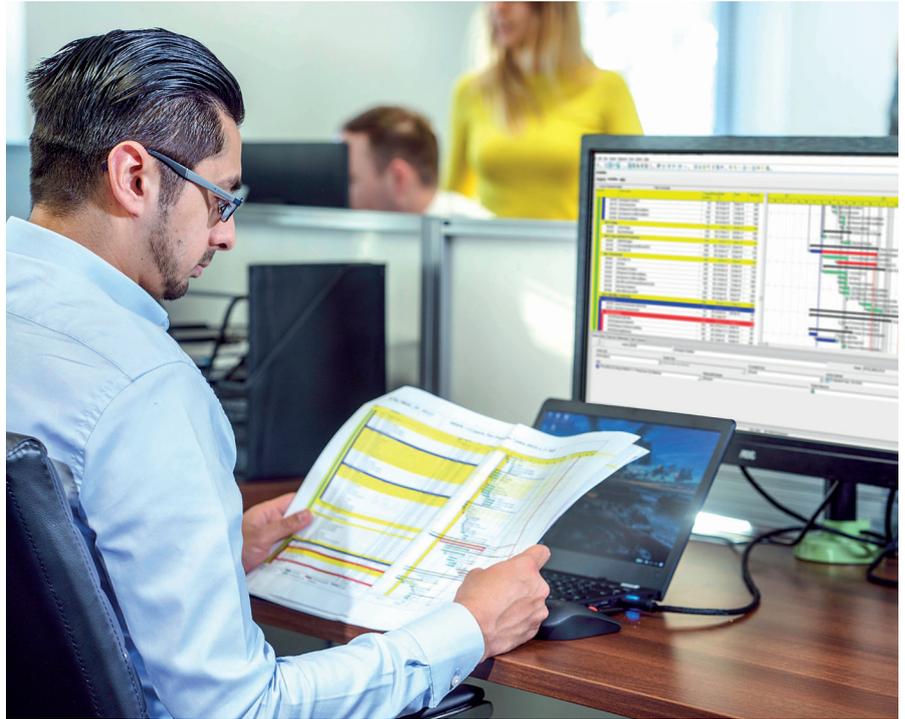
Petrol/diesel cars banned by 2040

The UK is banning the sale of diesel and petrol cars by 2040 but based on pollution levels, specialists think it is too late. The National Grid has declared that it can manage the phase out a decade earlier, proposing to move the ban to 2030. This means an increase of Electric Vehicles from 130 thousand now to 9 million by 2030.

For people who spend a lot of time commuting or businesses with a fleet for delivery or shipping, charging cars might be a bit inconvenient. Having batteries at home or where cars park when not in use makes perfect sense, especially when a renewable energy system is installed. This as well gives a sense of security in cases of black-outs or emergencies.

Extreme weather cases

Nine storms hit the UK between September 2017 and January 2018, these



with cold and heat waves create a serious challenge for the National Grid to secure electricity and minimise blackouts. But blackouts happen, and that is when people realise the importance of it especially when turning on a heater or a fan can literally save lives.

Batteries can be a great source of security in the cases of extreme weather events as consumers can always switch to them when electricity from the grid is not available. Similarly, it can help commercial

or industrial users avoid paying a fortune during the triads.

Regulations change

A few months ago, the capacity market was extremely displeased with the government's decision to change the de-rating factor for batteries. This change made short duration batteries completely unprofitable as it caused up to 80% financial losses to batteries with 30-minute duration.

'Batteries must be thought of as piggy banks, you store electricity in them when there is surplus or when you can afford it and you will definitely find it when you need it.'



Scottish Power has recently proposed a similar de-rating for Demand Side Response. This suggestion was unwelcomed by people investing in the market. And it creates a real concern for people thinking of installing behind the meter batteries in the future if the regulations are to change.

10 years back, people thought solar PV systems will get cheaper by time and decided not to make good use of governmental incentives, which have

stopped two years ago. A lesson can be learned from that and from the de-rating changes; the sooner people invest in batteries the better. Waiting for prices to drop can be less financially feasible when regulations change.

Cost, cost, cost

Signing carbon reduction agreements and committing to reforming the energy sector to reduce the greenhouse gas emissions has a cost. This cost is being paid by UK residents as a tax on imported electricity.

The less you import, the less you pay.

All the points mentioned above about batteries had one thing in common, maximising financial revenues. No one can deny that economic feasibility is a great motivator in times of expensive electricity and growing demand. Batteries must be thought of as piggy banks, you store electricity in them when there is surplus or when you can afford it and you will definitely find it when you need it.

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