



# Let the green beers flow

by Fred Hartshorn, Country Manager, UK, Invinity Energy Systems

BrewDog made a big splash this summer when it announced its intention to become carbon negative by planting 1,500 acres of native woodlands, the "BrewDog Forest".

It's a bold and admirable plan, but there are simpler, more cost-effective and more direct methods of reducing your climate impact.

The cost of solar power has plummeted by 82% over the last ten years, to become a "no-brainer" for any manufacturing business to save money and showcase its green credentials.

Solar panels help by generating cheap power during the day and reducing the amount of energy a brewery imports from the grid. However, this is the UK after all, and you can't always rely on sunshine! This is where energy storage comes in.

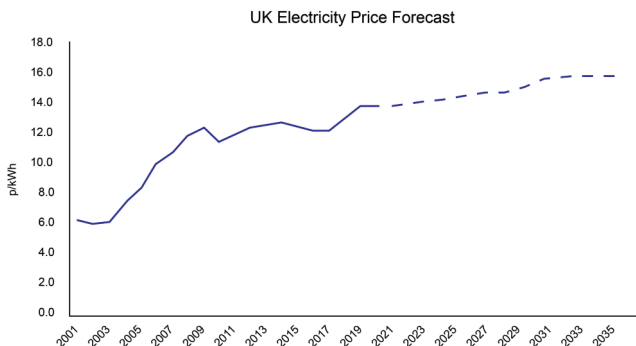
## Working on sunshine

Energy storage allows you to charge your battery at times when you are producing an abundance of cheap energy i.e. during the middle of the day and then discharge it later at the end of the day when the peak electricity costs kick in on your tariff.

Having solar and energy storage together means breweries maximise the amount of solar power they use, especially during peak times when it's most expensive to buy from the grid. This also means that you can directly and effectively reduce your carbon emissions at source, rather than offsetting them "after the fact" through carbon capture methods such as planting forests.

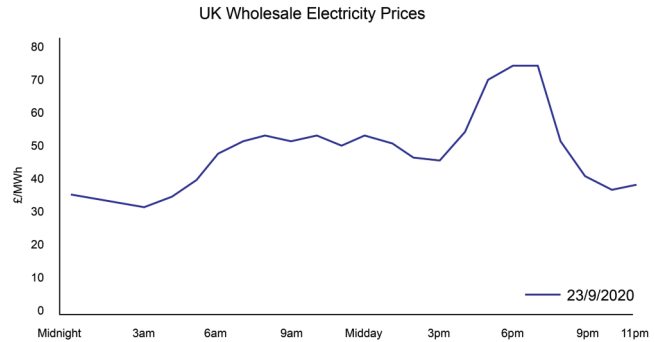
By its very nature, the operation of a brewery is extremely well suited to benefit from clean energy solutions like this. Energy usage in breweries varies depending on size, location, and product, but brewing, fermenting, filtering and packaging beer are all very energy intensive processes.

On average, it takes 15-20 kWh of electrical power to brew one barrel of beer at a typical price of around 14p/kWh. For smaller breweries, this electricity cost will be even greater as they can't gain access to the cheaper tariffs available to the larger players. These prices are also set to rise in the years to come according to UK government data.



UK electricity prices, 15 year forecast. Source: Department for Business, Energy and Industrial Strategy (BEIS)

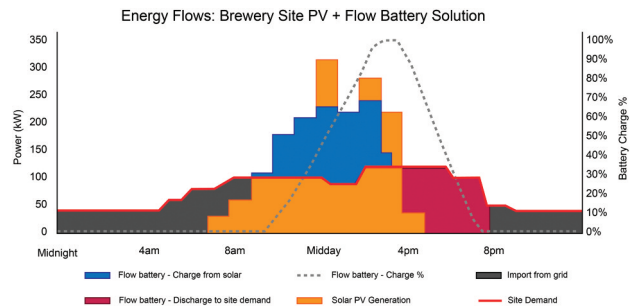
Brewing is a 24/7 operation and energy is demanded around the clock. As a result, breweries are more exposed than many other industries to peak power prices (which typically occur between 5-7pm, when national power demand is at its highest).



UK wholesale electricity price fluctuations over a typical day. Source: UK Day Ahead Auction Prices, Nord Pool

## Solar Powered Brewing

We modelled the impact of installing solar panels with one of Invinity's vanadium flow batteries at a mid-sized UK brewery (producing 150,000-200,000 barrels a year) and the impact is dramatic. You can see the daily operation of the system in the graphic below.



Daily operation of a PV + flow battery system at a brewery

Installing 700kWp of solar panels coupled with a flow battery system could lead to a 50% reduction in a brewery's energy bill annually and reduce its carbon footprint by up to half, offering a ROI of 2.1.

A brewery with bills of around £140,000 per year would save as much as £2.8 million over the 20 year lifetime of the project assuming energy costs rise in line with inflation (CPI, 2%) year-on-year.

Vanadium flow batteries are well-suited to the brewing sector as, unlike the dominant technology, lithium-ion, they don't degrade, so don't need to be replaced often, even when used heavily. They are also non-flammable and can store and discharge energy for longer, to flatten the peaks in demand over the course of the day.

## Green recovery

Pre-Covid-19, profound changes were already under way in the industry to shift towards a more sustainable model. However, despite widespread adoption of renewable energy by brewers, the integration of energy storage to maximise those assets, is relatively low.

Now is the time for that to change, as major breweries look to build back better and 'invest to save', so that when the pandemic ends, the drinks can flow.

For further information:

[www.invinity.com](http://www.invinity.com)