

Power to your business

Episode 4: The future of clean energy

JULY 2024

Welcome to the fourth webinar in our Power to Your Business series.

In July 2024, Solarsense brought together a panel of experts to look at some of the latest innovations in clean energy and find out what they mean for your business.

We heard how the renewable energy sector has changed in recent decades and the different factors driving the ongoing growth of solar. The panel spoke in detail about three new technologies: SolarEdge, an energy management solution; TesVolt, a cutting-edge battery storage system; and GridImp, a smart energy control system. The session concluded with a discussion of the latest and best options for financing clean energy, followed by live questions from the audience.

This paper captures key messages that came out of the event. To watch the full webinar visit www.solarsense-uk.com or for specific questions please contact Solarsense at info@solarsense-uk.com or on **0333 772 1800**.

With thanks to our panel



Christelle Barnes is UK country manager at SolarEdge Technologies and is also vice chair of trade association Solar Energy UK, where she has recently been re-elected for a second 3-year term.



Stephen Barrett launched Solarsense in 1995 in an effort to provide local homeowners and businesses with a sustainable alternative to fossil fuels. Since then he has led the business to deliver more than 20,000 solar installations across the UK.



Tim Cook is a commercial energy consultant at TDC Renewables with more than a decade of experience in the clean energy sector. He works with a wide range of businesses to deliver strategic direction for their on-going energy needs.



Matthew Doughty is an expert in electrical engineering and is Business Development Manager at Tesvolt, a leading manufacturer of energy storage systems for commerce and industry.



Stuart Graham has worked in the asset finance sector for 17 years and is a Director in Lombard's Specialist Sectors Team, focussing on Renewable Energy Finance.



Richard Ryan has worked in the field of energy and the built environment for almost 20 years and is co-founder and commercial director at Gridimp.



A 317kWp solar PV installation for leading drinks brand, Brothers Drinks. Comprised of 772 solar panels and incorporating SolarEdge optimisation with an online monitoring portal, the solar PV system was connected at the start of June 2024 and is expected to pay for itself in less than 3-years.

A changing landscape

Times have changed since Solarsense was founded almost 30 years ago. In the early days, solar was only installed by enthusiasts for environmental reasons. It later became a good investment for homeowners, but only because of generous government subsidies in the form of the feed-in tariff.

Nowadays, thanks to dramatic improvements in the cost and efficiency of solar panels, subsidies are no longer required – solar PV offers a short payback (as little as 2-years in some cases), and many businesses are investing in renewables for energy security as well as the financial benefits. This means that energy storage, as well as on-site generation, is becoming increasingly important.

“We’re looking at how we can make solar power work for us 24 hours a day. We can do that through energy management. We can do that through storage. So, there’s been quite significant changes in in the last few years. A typical solar installation now looks very different to what it did five years ago.” – Christelle Barnes, SolarEdge

It’s not only solar panel technology that has improved: batteries have also become smarter and less expensive, they can now be combined with AI to make decisions on behalf of the customer.

Solar PV Optimisation and Monitoring

Founded in 2006, [SolarEdge](#) started as an inverter manufacturer with a desire to do things differently: they wanted to make energy generation and the usage of electricity smarter.

In a traditional solar PV system, the panels are connected in parallel with a standard string inverter. This means that if the output of one of the panels is reduced, for example by shade from a tree or chimney, or because of bird mess, then all the panels that are connected in that circuit will under perform. In contrast, with SolarEdge, each panel – or pair of panels – operates independently.

“The joy of SolarEdge is that if you’ve got a panel mismatch or shading over one panel, the system still generates to its maximum potential. It can also identify panels that are not working correctly and need to be looked at.” – Tim Cook, TDC Renewables

The SolarEdge system includes a detailed monitoring portal to enable businesses to get a full picture of what their system is generating, how much energy is being used on-site and what is being exported to the grid. This has enabled some of Solarsense’s clients, such as Alderman’s (pictured above right) to adapt their shift patterns so they are making better use of the solar power generated on-site, for example by working at weekends during summer months instead of late nights.



A 263kWp solar PV system installed at Alderman Tooling in Plymouth (estimated to pay back installation costs within 3 years and generate a net profit of £3 million over the next 25 years).

Innovations in solar panel technology

Solar panels have dramatically improved in efficiency in the past 10-15 years. A decade ago, a standard panel had an output of 225-250W; the same size panel nowadays would produce around 450W. Panel manufacturers are also now offering much longer warranties. Ten years ago, panels typically came with a 12-year product warranty and a 25-year power output warranty; this has recently been extended to 15 or 20 years, with a 30-year power output warranty. This means that a solar panel installed today will still be 85% as efficient in 30 years – that’s a long-lasting asset.



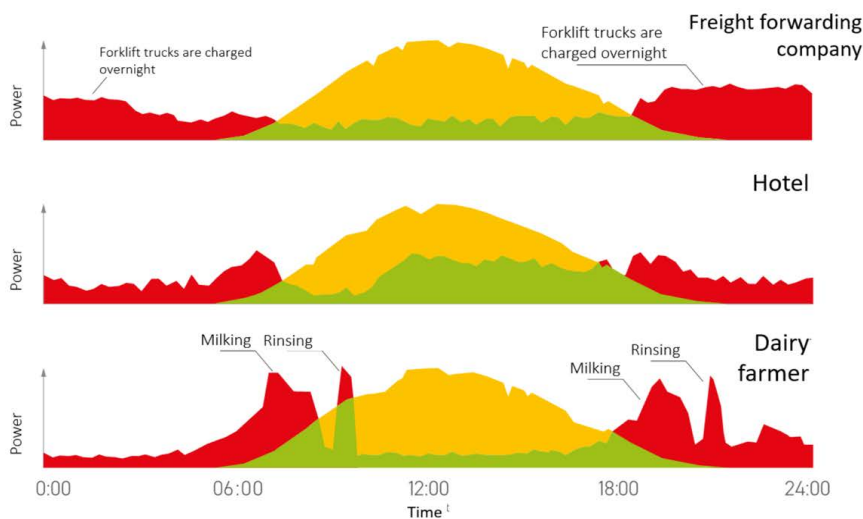
Battery storage

Founded in 2014, **TESVOLT** produces award-winning battery storage systems for commerce and industry. With more than 5000 projects worldwide, the German based manufacturer is leading the market for renewable energy storage solutions.

TESVOLT energy storage systems are the economical choice for the most demanding applications. From 10 kWh to 30 MWh outputs, connected to low or high voltage, on-grid or off-grid - their broad product portfolio covers the full range of applications and can be individually adapted to your requirements.

Whether your business is aiming to reduce your reliance on the National Grid via self consumption optimisation, cut your energy costs with peak shaving, or using a battery as a backup in case of power failures - the broad product range from TESVOLT offers a whole host of potential applications for all types of business in every industry sector.

One of the key reasons for installing a battery is self-consumption optimisation, explained Matthew Doughty. This is about consuming as much of the energy you generate yourself as possible – rather than exporting it to the grid – and minimising what you need to import, especially during peak demand between 4pm and 7pm. The below graphs show the energy profiles of three typical businesses without battery storage. It is clear to see that much of the self-generated energy is not used on-site and sold at a low rate to the grid.



■ Electricity drawn from the grid
 ■ Self-generated electricity
 ■ Self-consumption solar energy



A 134kWh TESVOLT TS HV 70 Outdoor Energy Storage Solution installed for Avon Fire and Rescue Service. Integrated with 352 solar PV panels, the system stores any excess electricity for use during peak demand, reducing their reliance on the National Grid.

Even without on-site solar energy generation, businesses may choose to charge up a battery at a time when energy prices are low (e.g. at night) for use during peak times. Battery storage can also enable businesses to supply extra power (above their DNO connection capacity) for machinery if they are constrained by grid capacity, or provide back-up power for emergencies.

“While more and more businesses are considering investing in batteries as part of a solar installation, it is not a case of ‘one size fits all’. If you expect to use 95% of the power you generate on-site, it’s not worth the capital investment. However, if the split is more likely to be 50/50 or even 60/40, it is certainly worth considering” – Tim Cook, TDC

When investing in an energy storage solution it is worth getting expert advice to make sure the battery is the optimal size, capacity and performance, connected in the right way (AC or DC) and comes with the right warranty – not all batteries are the same! If comparing quotes from more than one supplier, it’s important to make sure you are comparing like for like.



St Mary’s Old Boys RFC installed solar panels and a battery storage solution so they could use the solar energy they generated during the day to power their flood lights, bar and cellar at night. The installation was completed within a matter of days, immediately resulting in a repayment of over £1000 from their energy provider and a reduction of £200/month on their utility bills.

Dynamic tariffs

Battery storage may soon become even more important with the advent of more flexible pricing in the energy market. On the wholesale energy market, the price already varies by the half-hour and in 2026 this will be passed onto consumers: businesses will start to be charged up to 48 different unit rates over a 24-hour period. This will make self-consumption optimisation even more critical as the pricing will reflect the availability of renewable energy throughout the day.

Smart energy controls

The Department for Energy Security and Net Zero has confirmed that UK electricity generated by wind, solar and hydro outstripped fossil fuels for the third time in four years. Renewables' share increased to a record 46.4% in 2023 – up from 41.7% in the previous year, mainly thanks to wind and solar generation shares reaching new record highs.



Avon Fire and Rescue Service Clean Energy Project combining solar PV, solar thermal, heat pumps, TEVOLT battery and EV charge points.

Renewable generation is intermittent. It changes when the wind blows or when the sun shines. This affects the availability and therefore the cost of energy at different times of the day. As described above, this will soon be reflected in a more dynamic model for energy pricing which creates more risk for businesses – as well as new opportunities.

GridImp is a smart energy control system that enables businesses to mitigate that risk by automatically adapting their consumption habits to reflect the varying costs and availability of energy.

“Let’s say it isn’t as sunny today as you expect and so your PV panels aren’t going to produce as much energy as you expect. You’re not going to change your consumption habits because you’re busy. Everybody’s busy. Should you delay your EV charging? Should you turn down your air conditioning? You need an agent to make those day-to-day optimisations for you” – Richard Ryan, GridImp

Using AI, GridImp forecasts on-site generation, consumption and price changes to create a plan throughout the day to optimise energy usage. This could result in thousands of tiny adjustments that may seem small on their own but quickly add up: some early adopters of the technology have reduced their energy costs by as much as 50%. Others are getting paid a third of their energy back through flexibility payments – this is where they can modulate their demand to take the strain off the grid.

Energy management is likely to be one of the next big things in the clean energy sector. SolarEdge has also recently launched an energy management solution that can be integrated with its inverter technology and monitoring platform (see page 3).

Renewable energy finance

Lombard's specialist finance team has seen an 80% increase in lending for renewable energy projects between 2022 and 2023. Director at [Lombard](#), Stuart Graham, told us this “avalanche of demand” was a response to the huge spike in energy costs – which has served to move the issue up the agenda for businesses – combined with the decline in technology costs and improvement in solar panel performance.

As well as solar PV, Lombard finances a range of other renewable technologies including heat pumps, battery storage, LED lighting, solar carports and EV charging infrastructure, as businesses start to take a more integrated approach to decarbonisation.

There are multiple options for funding available to businesses, including overdrafts, bank loans, revolving credit facilities, payment plans, cash, or asset finance via a lease purchase. However, asset finance has several advantages: it is a standard piece of documentation, it comes with minimal fees (compared to bank loans, for example) and the only security required is the assets themselves. It can be set up quickly and can be used to fund 100% of the project, without the need for a deposit.

“Every business, and every business case, is unique but typically I would expect a payback period of 4 to 7 years. We can structure the monthly payments so that you’re paying off more in those high-generating summer months and get it as close as possible to a cash-neutral investment.” – [Stuart Graham, Lombard](#)

Your questions

Q. If you are replacing solar panels with more efficient ones, what happens to the old panels? Can they be recycled?

Solar panels have been known to last more than 50 years, says Tim Cook, so Solarsense works with charities to reuse old panels. For example, the team recently fitted a refurbished solar PV system at the Brightwell (pictured), home of the West of England MS Therapy Charity. These were later integrated with three Tesla Powerwall batteries and will save the charity approximately £5000/year on their energy bills.



Q: How will the recent change of government affect the growth of clean energy?

It's early days, says Christelle Barnes of Solar Energy UK, but the initial signs are promising. Today we believe there's around 18.6GW of solar installed across the UK and the Labour government has set a target of 50GW by 2030, so that's a significant increase. There's also mention of investment – though I don't foresee any return to subsidies for solar as it now makes such good business sense on its own. In the world of electrification, solar is not just a 'nice to have'; it's becoming a necessity.

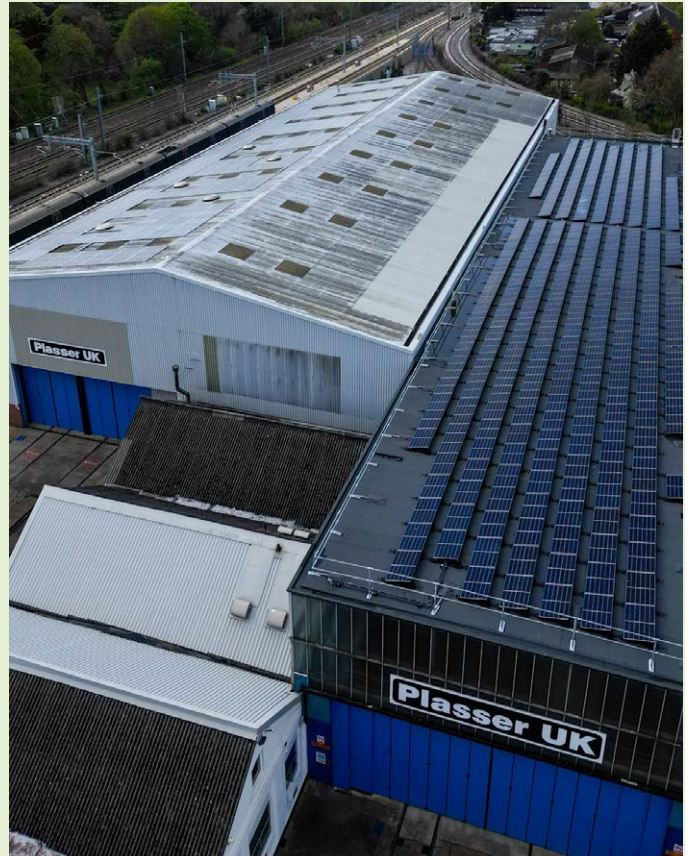
Q: Can new technologies be integrated easily into existing technology?

In short, yes! Tim Cook from Solarsense told us that updating an existing system might take one of two forms. Firstly, you might look to upgrade your existing solar installation with more efficient panels, whether that's replacing the old ones or, more likely, expanding the system because you've got a bit more roof space. If you already have the feed-in-tariff, you can keep it on your existing system as long as you keep the new system separate.

Secondly, in most cases it is possible to add an AC coupled battery storage system to an existing solar system to increase on-site consumption of the power you generate, and also to take advantage of off-peak charging rates.

Q: Will rising interest rates reduce demand for solar projects?

The main thing is to look at the long term gains, says Stuart Graham of Lombard. The interest element is only there for 4 or 5 years, and the assets are on the roof for at least 20 more, generating free energy for the business and mitigating all sorts of risks. The reality is that it might push your payback period by 6 to 12 months but when you're talking about a 25 year, 30 year lifespan of the products that's almost irrelevant – you've got to keep it in perspective.



Plasser UK installed its first solar system in 2015 and expanded it with an additional 339 panels eight years later.

If you have further questions please visit the Solarsense website www.solarsense-uk.com/ or call **0333 772 1800** to speak to a member of the team.

You can watch the full webinar at [Power to your Business Webinar – Episode 4](#)