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Onsite solar for business



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Expert viewpoint:
Centrica Business Solutions

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What is onsite solar?

Onsite solar refers to a solar photovoltaic (PV) system which is installed either on buildings or land on an organisation's site. The system is connected to the organisation's electrical network on its side of the main meter to provide power to its site.

Onsite solar is also referred to as being "behind-the-meter". Offsite solar, which directly provides solar power to the grid, is known as "in-front-of-the-meter". Typically, offsite solar refers to large solar farms.

It is also possible to connect a nearby solar installation (usually a ground-mounted system) into a customer's site as a behind-the-meter installation via a private-wire electricity cable.

The size of an onsite solar array will depend on roof space availability or spare ground capacity. As a simple guide, a 1MW rooftop solar project starts at around 4,000m² for

a pitched roof up to approximately 9,000m² for a flat roof, allowing for interrow shading. A 1MW ground-mounted project starts at around 9,000m².

Over the past 12 years, thousands of UK businesses have benefitted from the installation of solar generation on their sites. Many of these installations were undertaken with the benefit of Feed-in-Tariff subsidies, but this financial support is no longer available. More recently, a combination of solar cost reductions and energy cost increases have again made solar an equally worthwhile investment, with good paybacks.



A BIG YEAR FOR SOLAR

2021 has been heralded as "potentially the most significant year to date" for the UK's solar industry, which added 730MW of new capacity, an increase of 36% compared to 2020 levels.

Latest figures from Solar Energy UK, published in February 2022, showcase how the UK has added

730MW of new solar capacity, a 36% increase on 2020 levels, when 538MW was installed.

According to the body, some 369MW installed in 2021 was rooftop solar, the highest total since 2015 when 839MW of capacity was installed. The 2015 levels reflect the "significant" subsidies available to solar at the time.

In total, solar PV capacity in the UK now sits at 14.6GW, up 5.3% compared to 2020 levels. Solar Energy UK notes that all three solar markets – residential rooftop, commercial scale and ground-mount – are seeing stable growth without the assistance of subsidies.

SOARING ENERGY COSTS

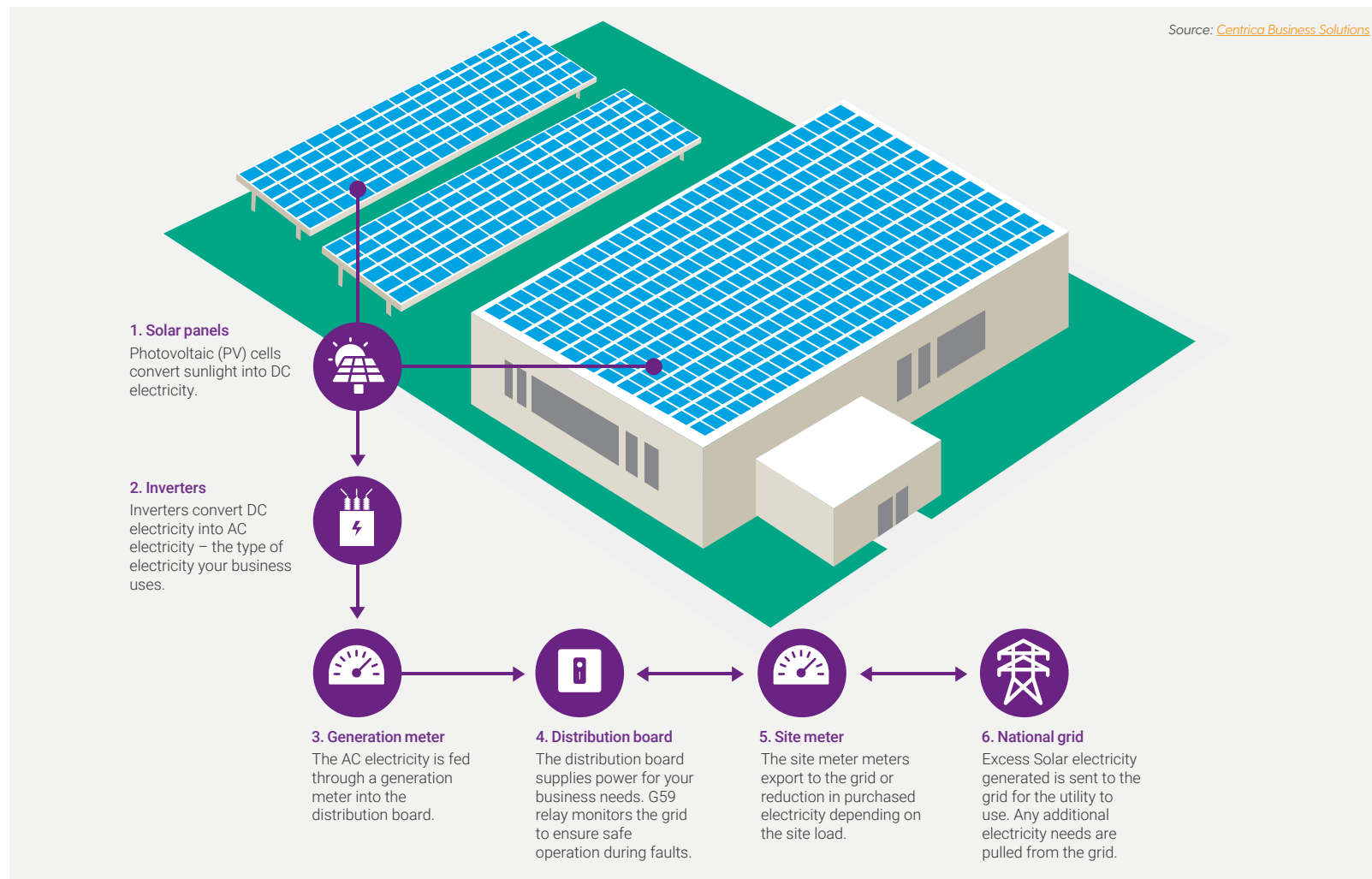
Energy prices have soared by an alarming level since June 2021 amid the demand for power in different industries and supplier constraints. As economies around the world recover from the pandemic, energy prices continue to steepen.

Indeed, the Federation of Small Businesses (FSB) estimates that, between February 2021 and August 2022, electricity bills have risen by 349% whilst gas bills are up 424%. As such, 53% of firms expect to collapse, shrink or, at best, stagnate over the next year, the FSB claims.

At a domestic level, households are braced for Ofgem to double the retail energy price cap to an estimated £3,600 from October. At a business level, without a corporate price cap, organisations are more exposed to sharp increases in wholesale energy markets.

Against this backdrop, onsite solar can play a huge part in helping alleviate some of these issues, by protecting firms from such price rises.

How does it work?



What type of business is onsite solar most suitable for?

Any organisation which consumes power during the day can benefit from using solar generated on its site. The key for a business is to install solutions which create the right balance between the use of renewable power and how they currently use energy.

Onsite solar is ideal for a business which has half-hourly metered

consumption, and where there is also weekend load.

Where a business does not own its site, but is in a leased property, additional factors that would need to be considered include: How long does the business intend to be at its current site, what is the current length of the lease, and is there landlord approval? This can vary dependent on an organisation's current lease agreement.

A business will also need to consider whether it has adequate land or sufficient roof space for an optimal size system for its load. A solar provider can quickly assess a project using Google Earth and some simple software modelling tools.

TOP TIP TALK TO YOU LANDLORD

If on a lease, a business should make sure it discusses installation of solar panels with the landlord before investing time and money to develop a project.

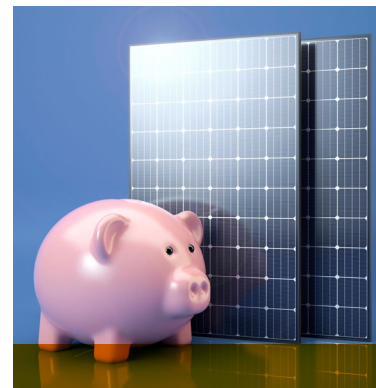
What are the business benefits of onsite solar?

Environmental

The primary way solar energy positively impacts the environment is that it reduces carbon emissions and greenhouse gases because the input fuel is sunlight. Unlike fossil fuels, solar power uses no pollutants and needs no other resources to function other than clean water to clean the panels.

Financial

Investing in onsite solar provides free power from the sun and a long-term fix of energy cost for a % of site requirements – beyond the capital investment. It also reduces a business's demand from the grid, thus lowering operating costs.



“Onsite solar provides a long-term view of energy cost for a % of site requirements... In fact, it can lower an organisation's electricity costs by as much as 30%. Many businesses see solar payback between 5-8 years.”

In fact, it can lower an organisation's electricity costs by as much as 30%. Solar paybacks of between 5-8 years are typical for many businesses, although individual situations may differ.

Staff

Installing solar power at a site can help educate staff, many of whom will have environmental concerns, about the advantages of this type of renewable power. And it can help give them a sense of pride in the place they work in.

Not only that, it can also inspire staff behaviours to look at how they use energy at work and in the home, and make adjustments to make their own lives less carbon-intensive.

Reputational

Installing solar can help demonstrate that an organisation has clear environmental goals, whether net-zero or a desire to fundamentally change industries views on using power.

It can also set an example for an organisation's supply chain and show its own customers that it is focused on the green agenda. People increasingly want to do business with companies that are seen to be doing good.

What are the costs of onsite solar?

This very much depends on the complexity, scale and type of project. It will depend on the number of connections, access requirements and long-term operations and maintenance aspirations.

Typically a metal-style pitched roof in a trapezoidal shape provides a lower cost base for solar panels. Meanwhile, flat roof projects will generally be more expensive because additional materials will be needed, such as ballast and framing to raise the pitch of the installation.

Ground projects come with similar considerations, but additional items such as security will also need to be taken into consideration.

What is the expected return on investment?

Solar is a long-term investment where paybacks can vary depending on a long-term view of energy costs, the complexity of a project and commitment to invest in operation and maintenance which aligns to an organisation's original business plan.

As mentioned earlier in this guide, solar can lower an organisation's electricity costs by as much as 30%. Many businesses see solar payback between 5-8 years.

What are the funding options for onsite solar?

The Feed-in-Tariff ended in April 2019. Currently there are no alternatives providing funding support, although for excess power that is exported to grid, all electricity providers are obliged to offer a Smart Export Guarantee. This provides export payments for any power generated from the system that is not used onsite.

A power purchase agreement (PPA) is the typical funding mechanism for solar. The PPA provider owns the system and will charge a customer for every kWh of energy that is generated. The PPA provider will also require a lease for the roof or ground where the system is installed.

There are other commercial financing solutions available on the market, including leasing via asset financing or even hire purchase agreements.

TOP TIP TAKE A LONG-TERM VIEW

In the current energy climate, a business should make sure it takes a long-term view - 25-30 years - when assessing whether solar installation is right for its site. This will avoid a distorted view of the benefits.

“Commercial solar installations hit 97MW during the months of April to June, which is more than any quarter since April 2019.”

What are the key considerations when looking to invest in onsite solar?

Site requirements

A business will need to ensure it has suitable electrical infrastructure to connect the solar to its site. It will also need to make sure it has suitable roof or ground space, including structural considerations.

Staffing requirements

Installation of solar should have very little impact on staffing requirements at site level. However, a business will need to ensure its onsite facilities team are familiar with how PV works and what to look out for if there are any issues. This can be supported remotely by the PV provider's own O&M teams.

Installation and maintenance

The design of the array needs to have long-term maintenance in mind, including arrangements for accessing the system for maintenance. Solar has little or no moving parts and, if designed and installed properly, very little can go wrong. It is important, however, to have an agreement which provides annual maintenance and can demonstrate a preventative maintenance regime.

For larger projects, there are organisations which can provide monitoring services to continually monitor the site and make sure it is performing as expected.

Grid connection and availability

This is crucial to the enablement of solar. It can take typically up to 65 days for the network operator (DNO) to process a request. Potential upgrading of the local network may be a requirement to enable a solar project for any site. Most solar providers can assist with applications to the local DNO. This can have an effect on the overall budget of a scheme as well as the timing of when solar can be physically connected, particularly for larger systems.

Planning

Planning permission may be required for solar installations. Whilst there are

permitted development regulations for solar PV installations, planning rules do vary between England, Scotland and Wales. In general, ground-mounted solar installations of any significant size will require planning permission, but even quite large rooftop installations may be classified as permitted development. Note that permitted development still requires approval from the local planning authority before commencing installation.

Intermittency

When the solar is not generating, a business will be importing energy from the grid. There is a potential for battery usage to store solar power at times of excess generation (peak shaving), but the commercial benefit of needs to be carefully assessed. This will depend on a number of factors, including the costs and size of the battery, and whether the battery can be made available for other services.

Data requirements and demands

In order to optimise the size of the solar installation, a business should provide historic energy consumption data and a forecast of future energy demands. This is key for the designer to size the array and forecast the commercial benefit for the business.

Timing

It is crucial to understand the development timing of a project. Considerations that need to be understood are grid connection and planning, which can vary dependant on the size and location of the array.

How can onsite solar connect with other onsite energy technologies?

Solar can act as a baseline to a smart grid and enable the capabilities of long-term development ie incorporating an expanding EV technology requirement.

Solar power is driven by the sun and the generation profile will therefore vary by time of day and year. Energy storage technologies, such as Lithium-ion or Flow batteries, can help balance supply and demand aspects.

“Solar can act as a baseline to a smart grid and enable the capabilities of long-term development ie incorporating an expanding EV technology requirement.”

As we transition to a distributed energy system, the volatility of the grid is increasing. By supporting the national grid operator with flexibility from its generation or power consuming assets, a business can access financial incentives and create new value.

In terms of connection with battery systems, a proprietary BESS (battery energy storage system) control system can help reduce peak consumption and reduce costs to supply site load at those times. It can also ensure optimal and cost-effective use of the onsite solar generation.

Optimising the BESS to reduce peak consumption and reduce costs to supply site load at those times, and

also to ensure making an optimal and cost-effective use of the onsite solar generation.

BESS will improve resilience of the site in case of grid supply disruptions, such as voltage sags and spikes, and brownouts. BESS can also be used to improve the power quality of the energy that supplies the site.

What is the future of onsite solar?

As previously mentioned in this guide, investments in onsite solar installations are continuing to increase across the UK, despite the ending of subsidies. This growth in onsite solar installations only looks set to continue as many businesses look to achieve net-zero targets and mitigate against rising energy costs.

The global and UK aspirations to reduce carbon coinciding with market pressures from oil and gas has placed solar at the forefront of providing solutions to challenges that both businesses and domestic customers are facing. Solar as a product can provide long-term renewable power solutions which help reduce the market demand from the grid. ■



EXPERT VIEWPOINT

Solar offers sunny relief from rocketing energy bills

Graham Phillips, Head of Solar Sales, Centrica Business Solutions

Rocketing energy prices and lower technology costs mean that investment in onsite solar is delivering faster payback than ever before.

Now is an ideal time to benefit from long term cost savings and advance your net-zero goals by generating 100% renewable power.

Attractive financial returns

Lately, we've seen the return on investment for solar PV projects increase by a third. For one client we were predicting annual energy savings of £43,000 six months ago, but this has risen to £78,000 today. Of course, the bigger your onsite solar array, the higher the potential savings.

Typically, you'll achieve payback within 5-8 years, but this has the potential to improve should the cost of energy continue to provide uncertainty. Considering that solar PV systems have a 25+ year lifespan

and are easy to maintain and operate, you can lock in to long term energy cost savings and future-proof your sustainable energy needs, while protecting your business from continued market volatility.

You can make use of unused space on rooftops or spare land to site your solar panels. This can also supply additional future renewable power needs, such as electric vehicle charging infrastructure and electric heat pumps in place of gas heating systems.

Unlocking the benefits of financed solar

If budgets are tight, there's potential to access zero CAPEX funding options. Our single solar finance

contract covers the complete costs of installing, operating and maintaining your solar asset on a performance-based cost model. Once a project is operational, you repay the investment via your realised energy savings. Power Purchase agreements may also be available.

Solar PV savings in action

We're installing 4,248 solar panels at the British Army's [Defence School of Transport](#), which is the first of four pilot projects. Across all four sites, annual savings of £1m and 2,000 tonnes of carbon dioxide equivalent are predicted.

As part of a £4.7m energy upgrade at [Hereford County Hospital](#), we're

installing more than 300 rooftop solar panels, while we've also worked with partners to design and construct a cost-effective large scale solar PV system for The London Borough of Southwark.

Among many water companies that are using solar power to reach net-zero, we're working with [Affinity Water](#) to generate nearly 1MWp of renewable energy by installing solar panels at its Chertsey production site.

Solar battery storage

Linking solar with [battery storage systems](#) can deliver even greater cost and carbon reduction by maximising solar utilisation and optimising energy use via peak power avoidance and Demand Side Response strategies, which can unlock flexibility revenues.

Solar battery storage also provides an uninterrupted clean power supply that can create carbon free back-up power to ensure resilience in the event of grid supply disruption.

Win-win on cost and carbon reduction

Onsite solar installations can deliver immediate cost and carbon advantage, while achieving greater security over supply and energy prices. You can also get ahead of tighter environmental regulations and higher carbon taxes, while future-proofing your organisation to capitalise on the benefits of the electrification of transport and heating.

Click here to see how onsite solar from Centrica Business Solutions can drive cost and carbon savings.