Powering Production

A guide to controlling energy costs and building businesses resilience with solar PV.

Geo Green Power

Who this guide is for

This Powering Production guide is designed for those with operational responsibility for manufacturing facilities, including operations managers, directors and facilities managers. It also examines the environmental and business cases for solar PV, making it a must-read for those with sustainability and financial oversight responsibilities.

Contents

"Manufacturing is one of the UK's most vital and energy-intensive sectors. It's also one that feels the effects of rising energy costs and operational disruptions more sharply than most.

For more than a decade, I've worked within manufacturing businesses and have seen firsthand how cost pressures, customer expectations, and shifting regulations influence decision-making and the industry.

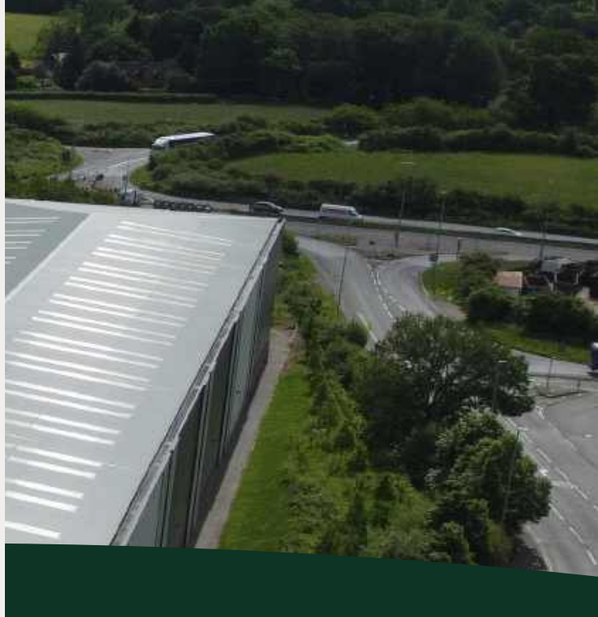
Likewise, at Geo Green Power, we've worked alongside UK manufacturers since 2010, so any investment must deliver value, whether that's through long-term savings, improved resilience or measurable progress towards environmental goals.

Solar PV is no longer something to consider in the future. It's a practical option for right now. With electricity costs staying high and pressure on the grid increasing, generating your own energy puts you in control. Solar is no longer just an environmentally driven decision, but one that makes robust commercial sense.

This 'Powering Production' guide brings together knowledge, experience and data to help you make an informed choice about solar PV for your business. Whether you're exploring solar PV energy for the first time or revisiting it in light of new business pressures, we hope this guide shows you what's possible."

"Solar is no longer an environmentally driven decision, but one that makes robust commercial sense."

Andrew Sanderson, Marketing Manager, Geo Green Power



Manufacturing: the energy challenge

The manufacturing sector faces a perfect storm. Whether a large-scale production firm for the automotive and aerospace industries, or a medium-sized food or plastics processor, businesses face high and rising demand for energy, coupled with price instability, ageing systems and growing scrutiny of environmental performance from customers and/or investors.

As a result, energy decisions have become strategic, affecting everything from margins to market position.

Sources of energy pressure

Energy-intensive operations

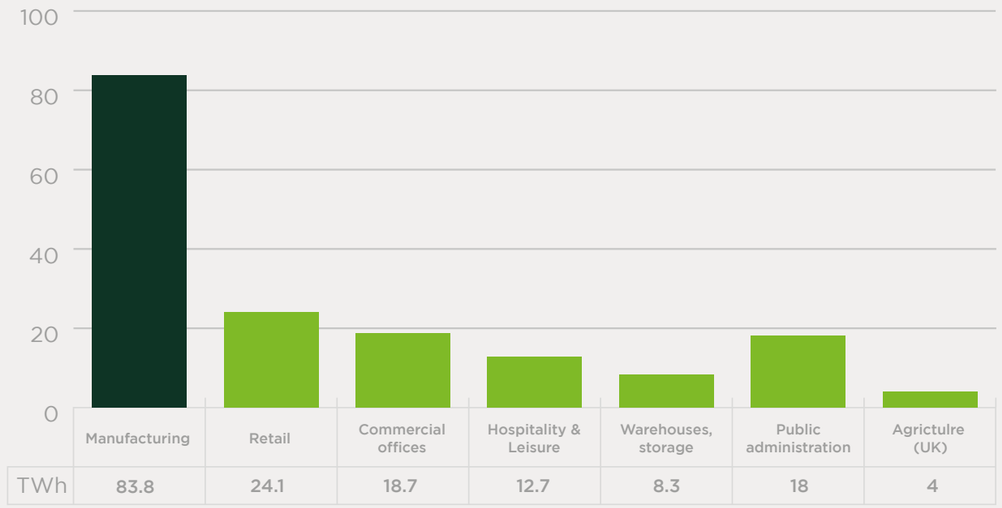
Processes such as casting, moulding, forging and machining operate at high temperatures, high speeds, and continuously, resulting in significant energy demand.

In 2021, manufacturing consumed over 83.8 TWh of electricity.[1] That's more than any other non-domestic sector and almost enough to power every single home in the UK Pharmaceuticals, chemicals and food processing alone account for around 40% of that total.

Rising and volatile energy prices

The UK has some of the highest industrial electricity prices in Europe, with prices 46% above the median of International Energy Agency member countries.[2] What's more, costs are projected to remain high due to global market shifts and the electrification of heat and transportation, which will increase electricity demand even further. For businesses working to tight margins, these rising prices can quickly become unmanageable.

UK non-domestic buildings electricity usage 2021



	Manufacturing	Retail	Commercial offices	Hospitality & Leisure	Warehouses, storage	Public administration	Agricultre (UK)
TWh	83.8	24.1	18.7	12.7	8.3	18	4

1 AMA Research (2024), Non-Domestic Rooftop Solar PV Market Report, based on BEIS ECUK 2021 data.
2 https://www.gov.uk/government/statistical-data-sets/international-industrial-energy-prices
3 AMA Research (2024), Non-Domestic Rooftop Solar PV Market Report, based on BEIS ECUK 2021 data.
4 AMA Research (2024), Non-Domestic Rooftop Solar PV Market Report, based on BEIS ECUK 2021 data.

Avoiding policy and carbon levies

Even when energy prices fall, manufacturers still face unavoidable costs. Policy and carbon levies such as Contracts for Difference (CfD), Feed-in Tarrifs (FiT) charges and the Renewables Obligation are charged to larger businesses to fund the transition to cleaner energy and stabilise the grid.

While it was recently announced that 7,000 British businesses will see their bills reduced by 25% as levies are removed[3], the changes do not apply to all manufacturers and will not take effect until 2027. An immediate way to reduce exposure to levies is for manufacturers to use solar PV to generate their own energy and reduce their reliance on the grid.

Managing outdated machinery

Machinery and equipment can quickly become outdated and inefficient, but budgets often don't always allow for timely upgrades. Data shows that compressed air, refrigeration, motors and drying equipment frequently operate below modern efficiency standards, yet collectively account for over one-third of manufacturing energy use.[4]

"It's critical that manufacturers take a longer-term view, considering energy beyond the next price increase. Instead, it's about building resilience with an energy strategy that will deliver for the next 10 to 15 years."

Andrew Sanderson, Marketing Manager, Geo Green Power

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Why solar, why now?

UK manufacturers are operating in an energy landscape that looks radically different from what it was even five years ago. Volatility has replaced stability. Energy prices have spiked, the grid is under strain, and scrutiny from investors, customers and regulators is intensifying. Meanwhile, manufacturers are under pressure to improve margins, reduce emissions, and maintain their competitiveness.

In this context, solar PV is no longer on the periphery; it's a core strategy for resilience, cost control and operational certainty.

1. Greater control over energy costs

With average industrial electricity prices in the UK rising over 70% between 2021 and 2023,[5] many manufacturers are seeing energy become one of their largest yet least predictable overheads. By generating a portion of their electricity through solar, businesses can gain greater control, or, with specific financing schemes, lock in lower, stable energy costs for up to 25 years. This protects margins and makes long-term planning more predictable.

2. Free up budget for other upgrades

By reducing reliance on grid-supplied energy, solar systems can deliver immediate operational savings, especially when installed under a Power Purchase Agreement (PPA), which requires no upfront investment. For many manufacturers, this creates headroom to invest in other priorities such as machinery upgrades, training, automation or efficiency improvements.

3. Meeting ESG and compliance expectations

Large UK businesses are now required to report in line with Task Force on Climate-related Financial Disclosures (TCFD) recommendations. Solar provides a clear, reportable reduction in Scope 2 emissions, with every kWh generated onsite a kWh that doesn't come from the grid.

4. Reduce exposure to grid constraints

The National Grid's own projections indicate that the electrification of transport and heat will increase demand and strain on local infrastructure.[6] In areas undergoing upgrades or nearing capacity, manufacturers risk being left behind if they delay investment. Securing and using local generation capacity now helps mitigate that risk and positions businesses ahead of future constraints.

Why now?

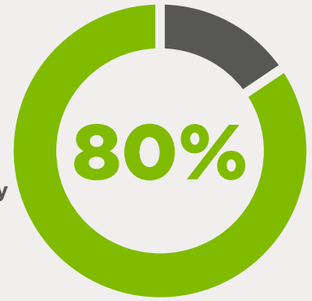
- Stabilise energy costs
- Free up CapEx for other investments
- Reduce Scope 2 emissions
- Avoid future grid constraints
- Respond confidently to customer and investor expectations
- Make intelligent, data-led decision on energy

5. Respond confidently to customer and investor expectations

Sustainability is now often embedded in procurement criteria, customer contracts and investment mandates. Generating renewable energy onsite demonstrates a proactive approach to climate responsibility and resilience. It reassures customers, strengthens bids and gives stakeholders clear evidence of commitment.

6. Solar systems are more advanced and more productive

Today's systems are delivering more power per panel and more value per pound. Panel efficiency has increased by more than 100% in the last decade, while **installation costs have dropped by over 80%**. Combined with faster installation times and improved inverters, this means manufacturers now achieve quicker returns and longer-term benefits, all with minimal site disruption.



7. Smarter, data-led energy strategies

Modern solar systems don't just generate energy; they help you manage it more effectively, too. With real-time reporting and intelligent monitoring platforms, manufacturers can take a more strategic approach to how they generate, use and store energy.

These systems can track generation and consumption, as well as import/export, in real time and across one or multiple sites, giving you a complete view of system performance. This capability enables businesses to make data-led decisions that improve efficiency, reduce waste and support long-term energy planning.

Integrated systems also support:

- Battery storage management, allowing you to store surplus energy and discharge it when grid prices are high
- Optimised EV fleet charging, helping you prioritise internal energy needs, eg for fleet charging, before exporting to the grid
- Proactive maintenance, with early issue detection to avoid downtime and performance loss
- Scalable planning, by highlighting future opportunities for expansion and investment

[5] Digest of UK Energy Statistics (DUKES) 2023
[6] https://www.nationalgrid.com/the-great-grid-upgrade/how-uk-electricity-grid-being-transformed

How solar supports the manufacturing model

Operational needs, physical footprint and long-term outlook make manufacturers ideally placed to benefit from solar investment.

Continuous, high-volume energy demand

Most manufacturers operate long, daytime shifts or continuous production cycles. This makes it easy to design a system to meet this consistent energy demand and maximise solar investment with limited surplus.

Large, stable roof areas

Manufacturers typically own or occupy large facilities with significant roof space. These are often underutilised assets that are perfect for solar installations.

Manufacturers already account for around 20% of all non-domestic rooftop solar, but there's still huge room to grow. The sector has an estimated 107 million square meters of available roof space, enough to accommodate 10GW of solar capacity, equivalent to the power required for around 3 million homes.

Long-term property occupation or ownership

Manufacturers tend to stay on their sites for the long term, which improves payback timelines and makes solar a more attractive strategic investment.

"Manufacturing businesses already understand optimisation and solar gives them another lever – one that's cleaner, more stable and delivers financial return."

Andrew Sanderson, Marketing Manager, Geo Green Power

Sector-Specific benefits

Food and beverage

Manufacturers in the food and beverage sector often have year-round refrigeration, automation and lighting needs, but at the same time face mounting pressure from retailers and customers to decarbonise and demonstrate provenance. Solar offers energy savings and a tangible way to deliver carbon reduction.

Chemicals and pharmaceuticals

As some of the UK's highest energy users, chemical and pharmaceutical manufacturers operate continuous processes with complex compliance requirements. Solar helps de-risk rising grid prices, bringing greater stability in cost.

Multi-site operators

Businesses with multiple sites can use pilot projects to test and learn their approach to solar before scaling across their portfolio. Phased investment also lowers risk and accelerates internal buy-in.

Tailoured solar solutions for your business profile

Manufacturers are well-positioned to benefit from solar energy, but no two operations are alike. We take the time to understand your site, energy profile and business priorities, then design the most effective solution to meet them.

Rooftop solar

Rooftop solar is the go-to solution for most manufacturers, making use of otherwise underutilised roof space. It delivers energy where it's needed, with minimal disruption and strong returns.

Ground mount systems

Where roof capacity is limited or energy needs are high, ground mount installations offer greater scale and flexibility. Ground mount systems are often suited to larger sites or those with adjoining land.

Solar car ports and EV integration

Turn car parks into power stations. Car ports with integrated EV charging support fleet electrification and demonstrate visible environmental improvements to staff and visitors.

Battery storage

Battery storage can be used to store solar energy for when you need it most, whether it's evenings, cloudy days, or during price spikes. Battery systems extend the value of your solar installation and support energy resilience.

Batteries can be:

- Charged using excess solar generation
- Set to charge from the grid at off-peak times
- Integrated into wider energy management systems

Smart integration

Forward-looking manufacturers are now combining solar with AI-powered systems and real-time monitoring to:

- Optimise generation and usage
- Predict maintenance
- Support demand-shifting across shifts or seasons

Funding options

One of the most significant shifts in solar adoption has been driven by the flexibility of funding models. Today, solar is no longer restricted to those with large capital reserves. With multiple finance options available, and many that require no upfront investment, manufacturers can take control of their energy without delaying other business priorities.

Capital Expenditure (CapEx)

CapEx is the most direct route to solar ownership. The manufacturer funds the system upfront and benefits fully from energy savings and any tax or depreciation benefits.

Best for: Businesses with healthy reserves or sustainability investment mandates.

Advantages:

- Full system ownership
- Immediate savings on energy
- No interest or third-party involvement
- Carbon savings

Power Purchase Agreement

With a PPA, a third party owns and operates the solar system, meaning there is no upfront cost. The manufacturer purchases the electricity it generates via the PPA at a fixed rate. This rate is typically below market cost and is agreed upon for a period of between 10 and 15 years, but can be up to 25 years, providing long-term stability in energy costs.

Best for: Manufacturers seeking savings without capital expenditures, or those with tight cash flow.

Advantages:

- No upfront or maintenance costs
- Long-term price stability
- Option to buy the system later
- Carbon savings

Asset Finance

Spread the cost of the system over a fixed term, typically four to seven years. Ownership remains with the purchaser, and the system is treated as a balance sheet asset.

Best for: Manufacturers wanting ownership but needing to preserve cash.

Advantages:

- Own the system
- Spread the cost over time
- Significant energy savings
- Carbon savings

Grants

Grants can cover up to 100% of the system cost, acting as a subsidy rather than a form of finance. These may be sector, location, or innovation-specific.

Best for: Businesses eligible under regional or government funding schemes.

Advantages:

- No repayment
- Same benefits as CapEx without the upfront cost
- Can be combined with other incentives
- Carbon savings

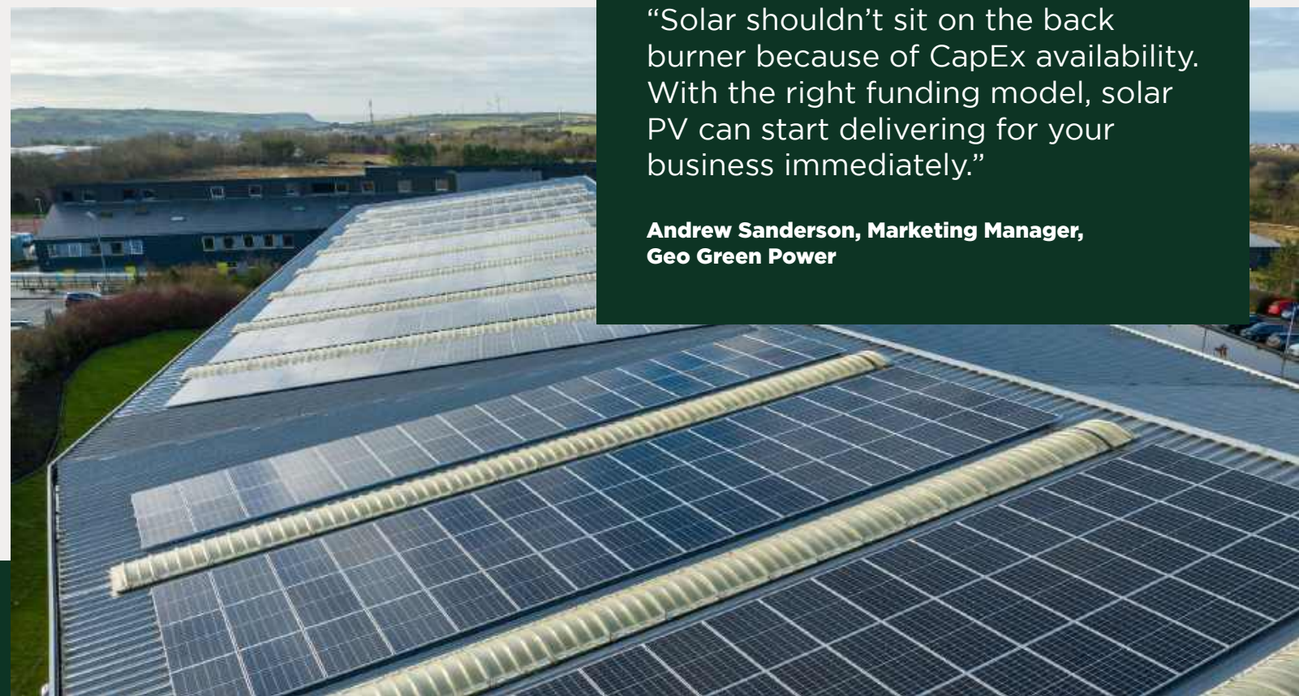
What's right for your business?

The right option depends on your cash flow, ownership preferences, and long-term financial goals. The Geo Green Power team can help assess the best route based on your system size, operations and payback expectations.

	CapEx	PPA	Asset Finance	Grants
How much of the initial investment do I pay?	100%	0%	20%*	100%**
Do I own the system?	Yes	No	Yes	Yes
Will there be a reduction in energy costs?	Yes, significant	Yes, good	Yes, significant	Yes, significant
Do I pay maintenance costs?	Yes	No	Yes	Yes
What is the typical term?	N/A	10 to 15 years, but can be up to 25 years	4 to 7 years, but can be between 2 and 10	N/A
Do I pay interest?	No	No	Yes	No
Will credit be required?	No	No	Yes	No
What is the set up time?	Quick	Moderate	Moderate	Slow
What happens at the end of the term?	N/A	Option to purchase system or end contract	Full ownership	N/A

* Typically the VAT value, which you can claim back in the next quarter

** This is the same as CapEx and whilst you pay for 100% of the system, a grant or subsidy goes towards that investment



"Solar shouldn't sit on the back burner because of CapEx availability. With the right funding model, solar PV can start delivering for your business immediately."

Andrew Sanderson, Marketing Manager, Geo Green Power

The business case for solar investment

An at-a-glance overview of the strategic benefits of solar for manufacturing businesses.

Strategic benefit	Why solar
Financial return on investments	Projected payback in 3–7 years via CapEx. Long-term savings dependent on volume of solar PV installed – see case studies for examples. Reduce exposure to policy levies that can make up to 15% of energy bills.
Zero-CapEx options	Power Purchase Agreements (PPAs) enable immediate benefits with no upfront cost and the ability to lock in low, predictable electricity costs for 15 years or more.
Minimal operational disruption	Installation timelines depend on how much solar PV is being installed, but it typically between one and four weeks. Disruption is minimal, with no production downtime
Maintenance & uptime	Minimal servicing required, but can be provided every year to protect yield and performance.
Carbon & ESG performance	Cuts Scope 2 emissions and enhances sustainability credentials. Supports TCFD-aligned reporting and investor engagement.
Grid resilience	Reduces reliance on the grid and mitigates future grid capacity constraints.
Scalability	Solar can be rolled out site-by-site, adapting to operational needs and building a portfolio-wide energy strategy.
Commercial advantage	Enhances bid competitiveness, supports supply chain requirements, and demonstrates leadership in cost control and carbon reduction.

Why partner with Geo Green Power?

We know manufacturing

From engineering-led design to working safely in live production environments, we understand the operational and compliance demands of manufacturing settings. We're used to delivering on tight schedules, minimising disruption, and aligning with wider energy and estate strategies, as well as health and safety requirements.

Built on trust and transparency

Everything we do is grounded in honest advice, clear timelines, and upfront pricing. We don't push what isn't needed, and we don't disappear after the install. Our reputation is built on long-term performance and personal accountability - values that matter just as much to us as they do to our clients.

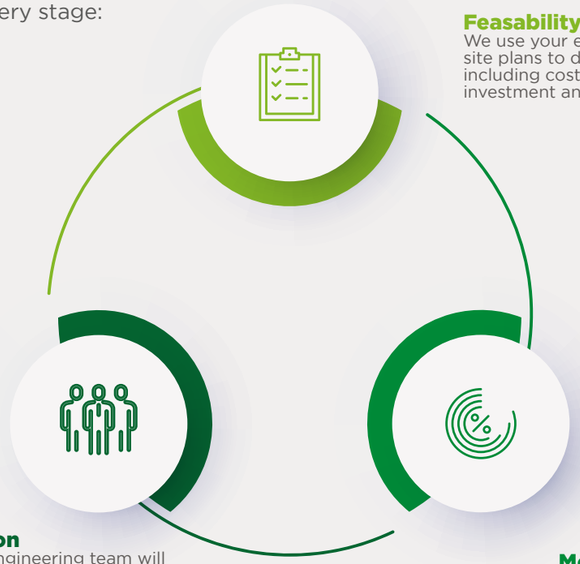
Your energy strategy deserves more than a one-size-fits-all solution.

Choosing solar is a strategic business decision, and the partner you select to deliver it can significantly impact the long-term success of your investment. At Geo Green Power, we don't just design and install systems. We build long-term relationships based on quality, transparency and performance.

We've delivered solar projects for UK manufacturers of all sizes for over 15 years. Our approach is pragmatic, data-led, and focused on outcomes that work for your business.

A partner from feasibility to long-term support

We support you at every stage:



Feasability and business case

We use your energy data, production profile, and site plans to develop a tailored solar proposal - including cost, projected output, return on investment and carbon impact.

Design and installation

Our in-house design and engineering team will plan the optimal system for your business. We handle Distribution Network Operator (DNO) applications, compliance, safety, and scheduling around your operations.

Monitoring and maintenance

Post-installation, we provide ongoing monitoring, servicing and performance reports. We also offer annual health checks and issue detection to ensure your investment continues to generate a return.

We promise to:

- Take the time to understand your business, energy needs and priorities
- Provide straightforward, honest advice
- Communicate clearly and regularly throughout your project
- Deliver safely, on time and budget
- Support your system's performance long after installation

Our accreditations

Accredited Contractor CHAS.co.uk

"We never start with a sales pitch - we start with what works for your site, your energy use, and your business model."

Andrew Sanderson, Marketing Manager, Geo Green Power

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Swift Precision Engineering

About the business

Swiftool Precision Engineering is a long-established, award-winning manufacturer that supplies precision-machined components. A family-run business, Swiftool Precision Engineering aims to expand its operations by developing innovative partnerships with customers and suppliers, and aspires to be recognised as the UK's foremost precision engineering provider.

Why solar PV

With growing customer expectations regarding carbon reduction and ESG, Swiftool Precision Engineering has developed a series of measures to improve its environmental sustainability. Installing solar PV panels provided a way to reduce its reliance on the grid, resulting in greater energy cost stability and resilience.

The system

- **Solar System Size: 617kWp**

The results

- **Annual Output: 483,000kWh**
- **Annual CO2 Saving: 105 Tonnes**
- **Expected Payback Period: 4 years**
- **Equivalent Cars Off The Road: 21**

A word from our client

"Myself and the SPE board were very pleased with our decision to appoint Geo Green Power as our renewable energy partner for the solar PV installation. It is a large investment for the business, and we needed to be 100% confident in our provider with regards to them meeting our expectations and delivering quality. Our solar PV is a flagship sustainability project and was essential to us meeting the requirements for the iiE Green Award."

Peter Tack, Non-Executive Director and Chair of the Green Team

The Cotswold Company

About the business

The Cotswold Company, an oak furniture and homeware business, has sustainability at its core. All its timber is responsibly sourced and every piece of furniture is crafted using traditional woodworking methods.

Having planted over 85,000 trees and removed 97% of polystyrene from its product packaging, the company continues to build on its sustainability goals, which include reducing Scope 2 emissions, becoming a B Corp-certified company, and providing sustainability training to all staff.

Why solar PV

A move to a new site in Lichfield fuelled the company's desire for solar, along with a goal of reaching net zero on its Scope 2 emissions by 2025. With its warehouse generating a significant portion of these emissions, it made sense to prioritise this site for its first solar installation.

The system

Solar System Size: 155kWp

The results

Annual Output: 130,840kWh

Annual CO2 Saving: 32 Tonnes

A word from our client

"It was great to find out that Geo Green Power are a family-based company. Since our first meeting with James on site and during our subsequent dealings with the team, we felt that Geo Green Power's values aligned with our own in terms of customer service, quality and sustainability goals."

Jacquie Silvester, Head of Sustainability, The Cotswold Company

Fluke Calibration

About the business

As a leading manufacturer of specialist solar testing equipment, Fluke has witnessed firsthand the growth of the solar industry, both in the UK, and worldwide.

Why solar PV

With sustainability at the heart of their operation and a keen appetite to reduce operational costs, Fluke looked at installing solar on 2 buildings at their Norfolk-based UK site. Just 200m away from Norwich airport, Fluke had a complex and specific need for their solar installation.

They also needed to partner with a company that had knowledge and experience of providing a solar solution through an asset finance funding model.

The system

- **Solar System Size: 480kWp**

The results

- **Annual Output: 380,000kWh**
- **Annual CO2 Saving: 95 Tonnes**
- **Expected Payback Period: 3 years**

A word from our client

“We found it very easy to work with the team at Geo Green Power. They were very professional, informative, and we can’t fault them at all.”

Dominic Olley, Indirect Purchaser, Fluke Calibration

Geo Green Power

"Thank you for taking the time to read our Powering Production guide.

At Geo Green Power, we've delivered commercial solar systems for more than 15 years, and in that time, the conversation has completely changed.

What was once a future-focused sustainability discussion is now firmly a boardroom priority. Manufacturers are facing persistent energy price volatility, increased grid pressure, and growing scrutiny from customers, investors and regulators.

We understand that investing in solar isn't just about the technology, it's about building resilience into your operations, cutting costs, and creating confidence in your long-term energy planning. Our approach is designed to make that process straightforward, tailored and commercially sound from day one.

We don't believe in one-size-fits-all solutions. We work closely with facilities managers, finance leads, and sustainability teams to understand your energy profile, site constraints and commercial goals, and then design the right system for you. Whether you're ready to go to tender or want to explore the business case, we're here to support that conversation with real numbers and real experience."

James Cunningham, Managing Director

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