Powering Care

How solar PV can reduce costs, build resilience and support sustainability across healthcare facilities.

Geo Green Power

Who this guide is for

This guide is for senior management, facilities and procurement professionals in both the private and public healthcare sector, and spans sites including hospitals, GP and dental practices, care homes and clinics.

Contents

The healthcare sector is central to UK society, but it is also one of the most energy-intensive. Hospitals, GP practices, care homes and clinics run around the clock, with no option for downtime. Electricity powers everything from MRI scanners and operating theatres to lighting, catering and laundry.

In theory, this constant demand and extensive estate makes healthcare a natural home for solar. However, solar energy currently plays only a marginal role.

For healthcare providers, this gap reflects both challenges and misconceptions, ranging from the complexity of procurement and infection control requirements to concerns about disruption. However, the context is changing, with costs rising, net zero targets looming, and technology improving rapidly, solar PV is becoming a viable, low-risk option for trusts, care providers, and primary care settings alike.

Energy is not just an operational cost in healthcare – it underpins safe patient care, thermal comfort, and air quality. As climate risks increase and costs remain volatile, solar PV offers a tangible way for providers to safeguard resilience, reduce emissions, and regain control over budgets.

To support this change, this guide brings together sector insights, operational considerations, and practical funding routes to help healthcare decision-makers explore how solar PV can support their estates, whether they are a large acute hospital, care home, or GP practice.

“The NHS must lead the UK’s response to climate change... Environmental considerations should be central to all decision-making processes.”

James Welland, Lead Commercial Surveyor, Geo Green Power

Energy: a picture of health

Healthcare facilities face some of the most complex energy challenges in the UK. Hospitals operate continuously, with intensive requirements for lighting, ventilation, heating and specialist medical equipment. Care homes must operate kitchens, laundries and resident services around the clock, while GP practices and clinics contribute to the overall demand across thousands of smaller sites. In every setting, energy is both an operational overhead and a clinical necessity.

Sources of energy pressure

Essential demand for patient safety and comfort

Patient safety and comfort mean the sector cannot compromise. Vulnerable patients, in particular, face increased risks when indoor temperatures are too high or too low. UK studies show that temperatures below 18°C increase respiratory and cardiovascular strain, while overheating above 25-28°C in wards is associated with patient discomfort and adverse outcomes.[1] Ventilation and indoor air quality are equally critical. Improving indoor air quality has the potential to reduce hospital stays, lower staff absence and deliver significant cost savings, with one UK study estimating benefits of up to £3 billion annually.[2] To achieve this balance, there is a need to heat, cool, and ventilate buildings to maintain safe conditions which, inevitably, increases energy demand.

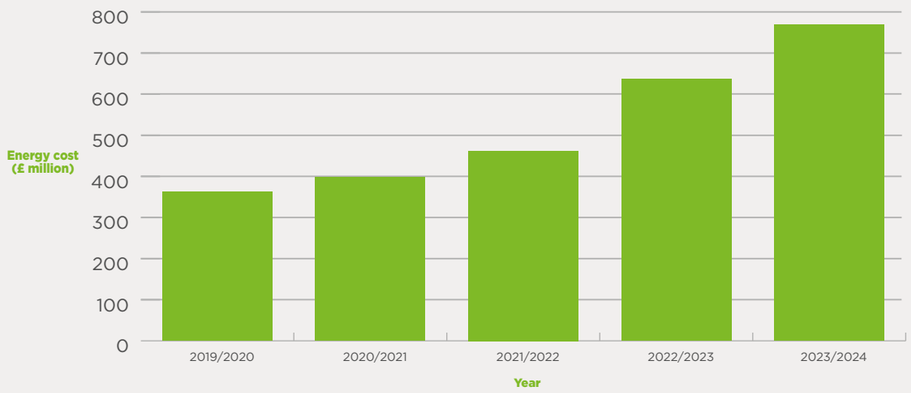
An ageing and diverse estate

Healthcare encompasses a diverse range of facilities, including large acute hospitals, community health centres, GP practices, dental surgeries, and more than 17,000 care homes. Many hospitals date back to the 1960s and 1980s, contributing to a £13.8 billion maintenance backlog.[3] Few buildings were designed with efficiency and renewable technologies in mind.

Sustainability pressures

The NHS has a statutory duty to reach net zero for both direct and indirect emissions by 2040. Every trust must publish a Green Plan setting out its decarbonisation pathway. Private operators are also under growing pressure from residents, patients, investors and regulators to demonstrate credible environmental action. At the same time, public spending pressures mean that energy strategy often takes a back seat to more immediate clinical priorities.

Total Electricity Costs Across NHS England 2019-2024



https://digital.nhs.uk/data-and-information/publications/statistical/estates-returns-information-collection

Rising costs and market risk

For healthcare operators, energy now competes with staffing and maintenance as one of the top three budget pressures. According to the latest NHS Estates Returns Information Collection (ERIC), the NHS in England consumed 11.1 billion kWh of energy in 2023-24, of which 2.7 billion kWh was electricity. Electricity costs alone reached £769 million, a 20% increase in a single year, despite usage rising by just 1%. Overall, energy costs for the NHS have more than doubled since 2019.[4]

In the care sector, utilities have also become one of the most significant overheads, directly impacting financial sustainability and stretching already fragile budgets. Care England warns that rising electricity consumption, combined with the UK's heavy reliance on gas and volatile international supply, will continue to drive up energy costs for providers, urging action to mitigate these risks. [5]

Exploring energy capacity more broadly, the UK remains heavily dependent on natural gas for electricity generation, but holds far less storage capacity than other European countries. This leaves the energy market vulnerable to cold spells, infrastructure disruptions or international competition for supply. At the same time, the National Grid's own projections indicate that the electrification of transport and heat will increase demand and strain on the electricity infrastructure.[6]

For healthcare providers, this volatility creates budgeting uncertainty, long-term financial risk and, critically, could endanger patient safety and comfort.

[1] H. Janssen, K. Ford, B. Gascoyne, R. Hill, M. Roberts, M.A. Bellis, S. Azam, Cold indoor temperatures and their association with health and well-being: a systematic literature review, Public Health and https://assets.publishing.service.gov.uk/media/65fdb71af1d3a0001d32ae74/Adverse_Weather_and_Health_Plan_supporting_evidence__1_.pdf
[2] https://www.imeche.org/news/news-article/clean-air-healthy-hospitals-the-potential-to-save-lives-and-nhs-budgets
[3] https://digital.nhs.uk/data-and-information/publications/statistical/estates-returns-information-collection/summary-page-and-dataset-for-eric-2023-24
[4] https://ukhealthalliance.org/news-item/welcome-investment-in-solar-panels-for-nhs-sites/
[5] https://www.careengland.org.uk/care-sector-energy-price-outlook-2025-2030
[6] https://www.nationalgrid.com/the-great-grid-upgrade/how-uk-electricity-grid-being-transformed

In healthcare, energy is not just an overhead. It underpins patient safety, recovery and wellbeing, making cost and supply pressures even harder to manage.

James Welland, Lead Commercial Surveyor, Geo Green Power

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Why solar PV, why now?

Despite constant demand and rising energy costs, solar currently meets less than 1% of the NHS's electricity needs. While trust-owned generation increased by 38% in 2023-24, it still accounted for just 15 million kWh of output, a fraction of the 2.7 billion kWh consumed across the NHS.

As costs rise, technology advances, and pressure to decarbonise grows, the landscape is shifting, with solar PV presenting a practical and increasingly urgent opportunity for providers across the healthcare sector.

Why solar makes business sense

1. Reducing reliance on volatile markets

With the UK still heavily dependent on imported gas and electricity, energy costs are expected to remain unpredictable in the years ahead. Generating electricity on site allows healthcare providers to offset a portion of their demand, reducing exposure to market fluctuations and creating greater budget certainty.

2.Aligning with net zero commitments

The NHS must achieve net zero direct emissions by 2040 and every trust is required to set out a Green Plan. For private providers, patients, residents and investors are increasingly scrutinising sustainability performance. Solar PV offers a visible, measurable step that can reduce emissions and demonstrate progress toward these commitments.

3. Supporting patient safety and comfort

Heating, cooling and ventilation systems are among the largest energy sources in healthcare estates. By generating renewable power on-site, providers can reduce the cost burden of maintaining safe temperatures and clean air, helping to safeguard comfort and recovery while lowering their bills.

Climate resilience is increasingly a clinical issue, with overheating, air pollution and extreme weather posing a threat to both estate safety and patient health.

4. Smarter, data-led energy strategies

Modern solar PV systems don't just generate energy; they help you manage it more effectively, too. Real-time reporting and intelligent monitoring can track generation and usage across one or multiple sites, supporting strategic decisions that improve efficiency and reduce waste.

Integrated systems also support:

- Battery storage management, allowing sites to store surplus energy and discharge it when grid prices are high or solar generation reduces
- Proactive maintenance, with early issue detection to avoid downtime and performance loss
- Scalable planning, by highlighting future opportunities for expansion and investment

[7] https://digital.nhs.uk/data-and-information/publications/statistical/estates-returns-information-collection/summary-page-and-dataset-for-eric-2023-24

5. Funding and financial models

Healthcare providers no longer need large capital budgets to get started with solar PV. Power Purchase Agreements (PPAs), asset finance and lease models enable installations with reduced or no upfront investment, and options to simply pay for the electricity used. These routes reduce financial risk and can deliver immediate savings from day one.

6. Advances in solar PV

Until recently, many healthcare providers saw solar as too disruptive, too complex, or not worth the return. However, advances in solar PV are changing that narrative.

Today's solar PV systems deliver more power per panel and more value per pound than ever before. In fact, panel efficiency has doubled in the last decade. These advances enable providers to generate more electricity per square metre and achieve better returns across a wider range of sites.

Just as importantly, installation methods have improved. Systems can be planned around clinical needs and delivered with minimal disruption. Solar PV is increasingly being installed on live hospital, healthcare and care home sites without compromising day-to-day care.

The technology itself is also more versatile. Modern panels are lighter and more compact, making them well-suited to older or more complex roofs.

Why now?

- Reduce reliance on volatile energy prices
- Cut operating costs without compromising care
- Progress against net zero and green plan targets
- Capitalise on advances in solar technology and efficiency
- Unlock funding without large upfront spend
- Make smarter, data-led energy decisions

How solar PV supports the healthcare sector

From acute hospitals and mental health trusts to GP surgeries and care homes, healthcare providers operate some of the most energy-intensive estates in the UK and stand to benefit significantly from on-site solar generation.

Continuous, high-priority energy demand

Across healthcare settings, energy usage is continuous and essential. Hospitals must power clinical and diagnostic equipment, HVAC systems, lighting and IT infrastructure 24 hours a day. Care homes run kitchens, laundries and communal areas around the clock. Even smaller primary care sites, such as GP practices and dental surgeries, have daily demand for heating, lighting and IT, often concentrated in peak daylight hours when grid electricity is most expensive.

This predictable, year-round usage makes it easy to size solar systems to the building's profile to maximise returns, delivering consistent cost savings while supporting clinical resilience.

Diverse but solar-ready sites

The healthcare estate is incredibly varied, from large, multi-site NHS trusts to standalone clinics and privately run care homes. While some buildings are compact or ageing, solar PV is not limited to new builds or expansive flat roofs. Smaller sites, such as GP surgeries or step-down units, may only accommodate mid-sized arrays, but when delivered at scale across a portfolio or Integrated Care System (ICS), the cumulative impact can be substantial.

Modern panel designs are also more adaptable, allowing for the installation of solar on complex roof structures. Meanwhile, car park and ground-mount systems provide additional options for sites with limited roof space.

A phased approach

Solar PV is well-suited to phasing. Multi-site NHS trusts and ICSs can pilot projects on a small number of buildings to refine procurement and build internal support before rolling out more widely. Trusts can also integrate solar into wider maintenance or refurbishment business cases, reducing disruption and improving overall cost efficiency.

Long-term use and estate ownership

Most healthcare sites, particularly NHS trusts, operate on long planning cycles and long-term leases or ownership arrangements. Solar PV delivers meaningful returns over 25–30 years, making it a strategic fit for these estate models.

25-30
year lifespan

Minimal disruption to operations

Installation methods have evolved to meet the needs of the healthcare sector. Most installs are completed in one to four weeks, with zero downtime to core services.

NHS sites already benefitting from solar PV

Manchester University NHS Foundation Trust
Three pilot sites, including acute hospitals. Estimated savings of £164,000 per year and £2.2m net present value over 30 years. Now expanding trust-wide.

£164,000
Estimated annual electricity bill savings

Hull University Teaching Hospitals, Health House
A solar PV array on Health House (Hull) produces over 300 MWh/year, cutting electricity bills by more than £60,000 annually. The project has become a model for other NHS Property Services sites, identifying further rooftop PV opportunities.

University Hospitals Sussex NHS FT
With approximately £2.6 million in funding, solar panels are being installed across several Hospitals (St Richard's, Princess Royal, Southlands). Annual energy savings are projected to exceed £360,000, enabling more funding to be allocated to frontline patient care.

Cheshire & Merseyside NHS Trusts
In March 2025, Cheshire & Merseyside NHS Trusts were awarded funding for several sites as part of the Great British Energy funding. One project includes 227 solar PV panels at Bridgewater Community Healthcare's headquarters, which are expected to produce approximately 90,000 kWh/year, resulting in an annual saving of around £25,000.

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Tailored solar solutions for your business profile

Healthcare providers operate across a broad range of building types, sizes and ages. Each site has its own unique operational needs, demand profile, and technical constraints. Solar PV solutions must be tailored to reflect these.

We take the time to understand your energy usage patterns, roof condition, site access and clinical pressures before designing a system that delivers long-term benefits with minimal disruption to care.

Rooftop solar PV

Most healthcare facilities can benefit from rooftop solar, using underutilised space to generate renewable energy at the point of use. Systems can be designed around infection control zones and patient access requirements, ensuring no disruption to care. Even smaller sites, such as health centres or care homes, can reduce energy costs and carbon emissions with thoughtfully designed PV schemes.

Battery storage

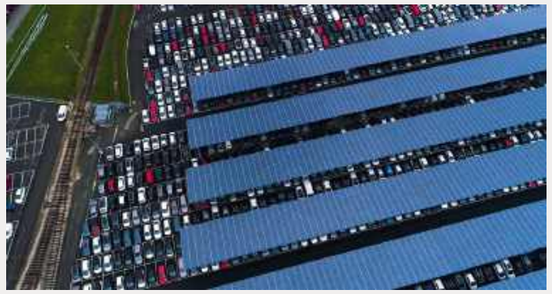
Battery systems store solar energy for use when it's most valuable, such as evenings or peak-price periods. Batteries can help extend the benefit of solar and improve energy resilience.

Batteries can be:

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

Ground mount systems

Where rooftop capacity is limited, ground-mounted systems provide a scalable alternative. Sites with adjacent land can use these to generate significant amounts of electricity while preserving rooftop access for other services.



Solar car ports and EV integration

NHS and care sites with large car parks can benefit from solar car port structures. These not only generate energy but also support EV charging for fleet vehicles, staff and visitors.

The business case for solar investment

An at-a-glance overview of the strategic benefits of solar PV for the healthcare sector.

Strategic benefit	Why solar
Financial return on investments	Projected payback in 2–7 years via CapEx. Long-term savings are dependent on the volume of solar PV installed.
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	Systems are designed and installed around clinical activity. Most installs are completed in under four weeks, with zero downtime to core services. Proven delivery models work on live hospital and care sites.
Maintenance & uptime	Minimal servicing required, but annual packages are available to protect yield and performance.
Carbon & ESG performance	Cuts Scope 2 emissions and supports NHS Net Zero, CQC reporting, and wider ESG goals. Public and private providers can demonstrate visible, auditable progress.
Grid resilience	Supports energy resilience and business continuity, reducing reliance on grid electricity during price spikes or capacity pressures.
Scalability	Systems can be phased across estates, integrated into maintenance cycles, or deployed at ICS level to scale benefits.
Commercial advantage	Improves operational sustainability, aligns with Green Plans, strengthens tenders and planning bids, and appeals to patients, staff and partners.

Funding options

One of the most significant shifts in solar PV adoption is the growing flexibility of funding models. Solar PV is no longer limited to those with large capital reserves. Today, NHS Trusts and private healthcare providers can access multiple finance routes, including those with no upfront costs, to reduce risk and deliver energy savings without delaying clinical or estate priorities.

Capital Expenditure (CapEx)

CapEx is the most direct route to solar PV ownership. The customer funds the system upfront and benefits fully from the energy savings, as well as any applicable depreciation or tax advantages.

Best for: Private providers, care home groups or NHS trusts with available sustainability budgets or Public Sector Decarbonisation Scheme-backed investment.

Advantages:

- Full system ownership
- Immediate savings on energy bills
- Carbon and cost savings fully retained
- Contributes to NHS net zero targets or ESG disclosures

Power Purchase Agreement (PPA)

A third-party investor funds, owns and installs the solar PV system. The customer then purchases the electricity it generates at a fixed rate, which is typically lower than grid costs, for a set term (10–25 years). PPAs remove the need for capital investment and reduce ongoing financial risk.

Best for: NHS trusts, ICSs or care providers without capital budgets who need price certainty.

Advantages:

- No upfront or maintenance costs
- Long-term energy price stability
- Quick deployment without CapEx approvals
- Measurable carbon reduction from day one
- Potential option to purchase the system in future

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: Providers wanting ownership but needing to preserve cash.

Advantages:

- Full system ownership
- Immediate savings on energy bills
- Carbon and cost savings fully retained
- Contributes to NHS net zero targets or ESG disclosures

What's right for your organisation?

The best route depends on your site ownership, financial structure and long-term energy strategy. For NHS trusts and ICSs, funding models must align with Green Plans and demonstrate value through lifecycle cost, net present value and clinical impact.

Private providers may have greater flexibility to self-fund or lease, and still benefit from clear ROI and sustainability gains.

Geo Green Power can support:

- Feasibility options
- NHS-specific business case development
- PPA structuring and procurement
- Grant application support

Private wire PPA

Some healthcare sites have very high energy demand but limited rooftop solar capacity. Even with a full rooftop array, many hospitals can only generate a small share of the electricity they use each day.

A private wire PPA offers a way to overcome those limits by supplying renewable, low-cost energy from a nearby solar PV installation that is developed specifically for the customer. This approach is sometimes called a 'behind-the-meter' arrangement.

How it works

A specialist investment partner develops a solar project on nearby land and connects it directly to the healthcare site via a dedicated cable. The provider does not pay for the land, planning, construction or maintenance. Instead, the organisation buys the electricity at a pre-agreed rate, which is usually far lower than grid prices.

For example, a hospital that can only meet some of its needs through rooftop solar could use a private wire PPA to cover more of its consumption with this additional source of energy. This reduces exposure to volatile grid prices and cuts operational costs without any capital expenditure.

Private wire generation is treated as an on-site supply under NHS carbon accounting guidelines, meaning the electricity counts towards scope 2 emission targets.

James Welland, Lead Commercial Surveyor, Geo Green Power

Grants and incentives

Several schemes provide part or full funding for solar PV, either standalone or as part of wider upgrades:

- **Public Sector Decarbonisation Scheme (PSDS):** Capital funding for NHS trusts undertaking broader energy and heat decarbonisation
- **Great British Energy Hospital and Schools Solar Programme:** Over £200 million allocated to fund rooftop solar on up to 200 NHS sites
- **Community Facilities Grant:** Local authority-led projects supporting solar and EV charging at smaller healthcare sites such as care homes and GP surgeries

Best for: Eligible NHS trusts and community care facilities.

Advantages:

- No repayment required
- Can be combined with other incentives
- Supports long-term sustainability and operational savings
- Helps trusts meet Green Plan goals

Why partner with Geo Green Power?

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

Choosing solar PV is a strategic 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 PV projects of all sizes for over 15 years. Our approach is pragmatic, data-led and focused on outcomes that work for your business.

Trusted public sector delivery

We're an approved supplier on NHS-accessible procurement frameworks, including Fusion21 – Heating, Renewables and Electricals and ESPO – Energy Performance of Buildings. These frameworks provide healthcare providers with a compliant and efficient route to appoint trusted solar partners.

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.

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, in budget and in line with operational healthcare site needs
- Support your system's performance long after installation

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.

Our accreditations

Citation ISO Certification – Quality management ISO 9001: 2015 – Certificate No 330942021

Citation ISO Certification – Environmental management ISO 14001: 2015 – Certificate No 330952022

Accredited Contractor CHAS.co.uk

"Every site is different. We start by understanding your energy use, operations and clinical priorities, then design a solution that fits."

James Welland, Lead Commercial Surveyor, Geo Green Power

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Broad Street Surgery

About the organisation

As one of two surgeries in Coventry serving over 13,000 patients, Broad Street Surgery plays a vital role in its local community. With patient numbers continuing to rise and healthcare demands increasing, the practice faces the same growing challenge as many others across the NHS – how to manage rising energy costs while maintaining quality care.

Why solar PV

The practice wanted to increase resilience, reduce reliance on the grid and protect its budget from further price volatility. Solar PV offered a practical way to lower operational costs with no compromise to clinical services.

A roof-mounted system was identified as the best option, enabling the practice to generate renewable electricity on-site and utilise its existing estate.

The system

Solar System Size: 25kWp

Designed to match daytime consumption for lighting, IT systems and medical equipment

Installed safely on a live healthcare site with no disruption to patients or staff

The results

Annual Output: 21,000Wh

Annual CO2 Saving: 5 Tonnes

£ Estimated Savings Over 30 Years: £200,000

Greater energy resilience and reduced exposure to future market volatility

A visible, pratical contribution to NHS net-zero commitments

A word from our client

“Working with the Geo Green Power team was an excellent experience from start to finish. Communication was clear throughout, the installation process was smooth, and every stage was handled efficiently and professionally.”

Dr Nabeel Malik, GP Partner, Broad Street Surgery

New Cross Hospital

About the business

New Cross Hospital is one of the West Midlands' largest acute healthcare facilities, serving thousands of patients each week. Like most hospitals, it operates continuously, with high daytime energy demand for clinical spaces, diagnostics, lighting, ventilation and essential support services.

Why solar PV

The Trust wanted to reduce electricity costs, cut emissions and make better use of the estate's available roof space. Solar PV offered a way to generate clean energy onsite without disrupting patient care, while supporting their wider sustainability commitments.

The system

Solar System Sizes: 224kWp

The results

Annual Output: 62,220Wh

Integrated into the build proramme to avoid disruption

A word from our team

"Projects such as New Cross demonstrate that investment in onsite renewables is both achievable and beneficial for the healthcare sector. We're delighted to be supporting many more hospitals and healthcare settings with the successful delivery of their solar PV investments."

Kat Auckland, Communications & Projects Director

Broadleaves Care Home

About the organisation

Situated in Nottinghamshire, Broadleaves Care Home is purpose-built housing, with a care scheme for older people who want to continue living independently. The scheme is a partnership arrangement between Newark and Sherwood District Council and Nottinghamshire County Council, with 20 apartments designated as Housing with Care for people who have been assessed as having support needs.

Why solar PV

With ever increasing energy prices, Newark and Sherwood District Council began looking into options to try and reduce costs and determined that installing solar panels on its larger assets would help offset running costs.

Following a competitive tender process, Geo Green Power was identified as the most competitively priced, combined with our overall rating, of the 12 bidders.

The system

Solar System Size: 100kWp

Installed safely on a live site with no disruption to residents

The results

Annual Output: 85,000Wh

Annual CO2 Saving: 21 Tonnes

Greater energy resilience

Expanded the site's sustainability credentials

A word from our client

"Working with Geo Green Power was a great experience, the operatives on site were all very amicable and carried out the works in a very timely and professional manner to a very high standard; this included the sub-contractor scaffold company. The office was responsive to any queries and dealt with any issues in a professional manner."

Dennis Roxburgh, Project Manager, Newark and Sherwood District Council

Geo Green Power

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

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

Rising energy costs, regulatory pressures and increasing clinical and operational demands are pushing estates teams, finance directors and ICS leads to take a more proactive approach to energy resilience and cost control.

We understand that solar PV isn't just about installing panels. It's about making the best use of your estate, reducing long-term overheads and protecting patient safety and service delivery, all while meeting your sustainability goals. Our approach is designed to make this process straightforward, low-risk and aligned to the realities of healthcare settings.

We don't offer off-the-shelf solutions. We work closely with estates teams, procurement, finance leads and sustainability officers to understand the operational needs of each site and design systems that deliver measurable outcomes.

Whether you're at the business case stage or ready to procure, we're here to support your next step with clear data, honest advice and proven experience."

James Cunningham, Managing Director, Geo Green Power

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