

Making buildings work harder for farm energy resilience

“As technology continues to improve and political appetite for clean energy grows, rooftop solar is likely to become an increasingly familiar feature of agricultural landscapes.”

HENRY CODY

From grain stores to machinery sheds, agricultural roofs are increasingly being seen as valuable energy assets, but delivering a successful solar installation requires more than fitting panels to spare space. *CPM* finds out what matters when it comes to making rooftop solar stack up on farm.

By Charlotte Cunningham

Interest in on-farm renewable energy is rising fast, and for many businesses the most accessible opportunity could quite literally be above their heads...

With mounting pressure on productive land and growing reluctance among farmers to consider ground-mounted solar, rooftops are steadily becoming the preferred location for photovoltaic systems (PV).

Installing panels on existing buildings avoids sacrificing hectareage while making use of dormant roof space that's long gone untapped. Yet the apparent simplicity of rooftop solar can mask a far more complex picture, where success depends on structural suitability, electrical capacity, energy demand and long-term commercial strategy.

Before diving into the technicalities,

it's useful to understand how the opportunity looks from a solar installer's perspective. Jon Helm of Green Home People, a York-based firm offering solar installations across domestic, commercial and industrial sites, has been monitoring the agricultural sector closely.

PRESERVING PRODUCTION

“The consistent message from the farms I've spoken to is that they don't want to give up good agricultural land,” he explains. “Covering fields with panels simply isn't attractive for them. But the big grain stores, barns and machinery sheds they already have present a completely different opportunity.

“Those roofs could support substantial systems capable of reducing electricity bills and, where possible,

generating additional income through exporting power back to the grid.”

Jon points out that many agricultural buildings are exceptionally well suited to solar due to their size and the efficiencies gained when installing larger arrays. He believes the economics are often more favourable than in the domestic market because the cost of adding extra panels is relatively low once



Ensuring viability

While rooftops can present real value, they are viable only when the fundamentals align, and those fundamentals must be examined in detail before any commitment is made, says Savills' Henry Cody.

► installers are already set up on site.

For some farms, the export potential alone could represent a significant benefit, he says. For others, the key attraction is offsetting the cost of electricity used for grain handling, workshop activity or any processing taking place on the farm.

“To get started, the best thing farmers can do is simply seek an honest assessment,” he says. “We can look at the roofs, evaluate the structure and electrics, and give them a clear picture of the likely return. From there it becomes much easier to decide whether solar fits their broader plans.”

Where Jon sees notable opportunity, Henry Cody of Savills sees the importance of rigour. Henry is a senior consultant in Savills’ Energy, Renewables and Infrastructure team and works closely with agricultural businesses exploring rooftop solar. He stresses that while rooftops can present real value, they are viable only when the fundamentals align, and those fundamentals must be examined in detail before any commitment is made.

“The biggest misconception is that any roof equals a solar scheme,” he says. “But the condition of the building, the nature of the electrical supply and the pattern of energy demand are the three factors that really determine whether the system will succeed.”

Henry has spent several years in the development of solar, battery storage and EV infrastructure, and now leads Savills’ rooftop solar activity. His focus is on guiding clients from long-term energy strategy through detailed feasibility work and into construction. In his experience, projects that succeed are those that

begin with a sober assessment rather than simply enthusiasm for green power.

The first and most important consideration is the building itself. Many older agricultural structures feature asbestos-containing materials which, if they require penetration for mounting, can halt a project before it begins, he points out.

While non-penetrating systems exist, they’re often inappropriate for exposed, wind-prone agricultural roofs, and may be restricted in terms of load capacity. Where asbestos is present, removal or full re-sheeting is usually required before solar can be installed. This adds

“Plan bigger, act smarter – and don’t underestimate the power of dependable renewables.”



Capitalising on unused space

Installing solar panels on existing buildings avoids sacrificing hectareage while making use of dormant roof space that’s long gone untapped.

cost and complexity, and can raise questions about whether the building is expected to remain in long-term use.

“Even when asbestos isn’t a concern, structural integrity must be verified, often through a structural engineer’s assessment. Some buildings simply aren’t designed for the weight and wind loading that a large solar array introduces,” he warns.

ELECTRICAL SUPPLY

Once the building fabric has been assessed and found fit for purpose, attention turns to the electrical supply. “Many farms operate on single-phase power which naturally limits the size of any system that can be installed,”

explains Henry. “In contrast, three-phase supply opens the door to much larger and more commercially-effective installations.”

But capacity alone isn’t the whole story – much of the rural

electrical infrastructure still relies on older cabling, outdated switchgear and distribution boards that may not meet modern standards. Solar adds new load into the system which can alter harmonics and raise operating temperatures, and it’s common to find that internal electrical arrangements require upgrading before the installation can proceed safely, notes Henry. “These works are often straightforward in

engineering terms, but can significantly influence the overall cost.”

Beyond the boundaries of the farm, grid constraints introduce another layer of complexity and in some regions, the local network is simply too constrained to permit export. In others, export may be accepted only under restrictive conditions, says Henry. “Where export is limited or unavailable, system design must focus on matching on-site demand, rather than covering all available roof space.

“This can be a frustration for farmers with large buildings but limited grid opportunity, and it’s a crucial factor in determining return on investment.”

Demand is the next decisive filter, he continues. “From an annualised perspective, solar generates most of its electricity around the middle of the day, yet many agricultural operations consume energy early in the morning or later in the afternoon and evening.

“Dairy units in particular can draw a great deal of energy at times that rarely align with solar output. Unless a farm has a strong daytime demand profile, the business case for solar weakens because much of the potential generation simply won’t displace grid imports. A careful analysis of the farm’s load profile is therefore essential to understand how much solar energy will be used in real time.”

Battery storage offers one route to improving alignment, allowing excess midday generation to be stored for

Building energy resilience in Essex

Investing in solar energy has helped futureproof the energy needs of a long-standing onion producer

Looking at how green energy can work practically, P.G. Rix Farms and its integrated processing arm Stourgarden have long supplied onions at scale, operating across growing, grading, storage and preparation since cultivations began in the late 1960s.

The model relies heavily on continuous energy input, with drying, cooling and year-round processing creating a substantial and consistent load. As energy prices became increasingly volatile, the business began exploring how on-site generation could stabilise costs and strengthen supply chain reliability – vital for its role as Tesco's dedicated onion supplier.

RenEnergy has worked with the business for more than a decade through a phased solar programme that now spans five installations. The first array on the onion store provided proof of concept; a larger system shortly followed on the grading facility, helping to supply a significant portion of daytime processing demand.

As the years progressed, solar was extended to the first two box stores, before the most technically involved phase arrived with the installation across stores 3-6. This required consolidating multiple grid supplies



into a single upgraded connection, removing duplicate standing charges, improving system efficiency and allowing solar to operate across the full load profile of the building.

The final stage, due for completion shortly, will equip the main preparation factory with a significant rooftop system and dedicated export capacity. In total, the farm's thousands of panels and dozens of inverters now form a site-wide generation network designed to match the business's energy curve during peak processing periods.

The impact has been significant. Much of the electricity required for cooling, grading and preparation is now delivered through on-site generation,

ensuring production continues even during peak-price periods or wider grid pressures. This has reduced exposure to volatility, stabilised operating costs and reinforced Stourgarden's ability to deliver consistently into major retailers.

Farmer John Rix says energy resilience is now integral to the business' performance. "Our integrated model depends on continuity, and dependable renewables support that from field to pack," he explains. "My advice for other producers? Plan bigger, act smarter – and don't underestimate the power of dependable renewables."

Note: All performance figures reflect industry-standard modelling at the time of installation.

later use. However, Henry emphasises that batteries introduce additional capital cost and are commercially justified only where the farm's demand profile supports them.

In terms of financial assistance, support for commercial rooftop solar unfortunately remains limited at the present time, says Henry. "While domestic schemes exist, they rarely apply to agricultural buildings, and local authority grants are inconsistent and often burdened with substantial administrative demands. Most commercial rooftop systems must therefore justify themselves without subsidy."

For tenant-occupied buildings, additional considerations arise around ownership, responsibilities, lease duration and end-of-term arrangements. Increasingly, landlords are entering

private power purchase agreements with tenants, selling them electricity at an agreed rate. These arrangements can work well but must be drafted with care to avoid uncertainty over dilapidations or long-term obligations, he advises.

REALISM

Ultimately, Henry believes that rooftop solar can be a highly effective investment for the right buildings and the right businesses. But he stresses that a clear-headed, sequential approach is vital.

For Savills, this begins with a strategic review of energy demands and a detailed assessment of building stock. This is followed by technical screening of structural and electrical factors, before moving into financial modelling, procurement and finally construction. Such an approach helps

to avoid late-stage surprises and ensures that systems are designed around genuine business need rather than optimism, explains Henry.

"If the building is sound, the electrical supply is sufficient and there's a strong demand profile that aligns with solar generation, rooftop PV can be a genuinely convincing addition to a farm business," he concludes. "But when even one of those ingredients is missing, the economics unravel quickly."

"As technology continues to improve and political appetite for clean energy grows, rooftop solar is likely to become an increasingly familiar feature of agricultural landscapes. For many farms, the question is no longer whether solar is relevant to their future, but how it can be deployed in a way that strengthens efficiency, resilience and long-term value." ●