HEAT PUMPS & RENEWABLES

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SEPTEMBER 2026

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Whitepaper

Practical approaches to controlling heat pumps

Installer insights and practical control strategies from across three heat pump markets

Page 34









SOLAR

Data centres are outgrowing the grid

Page 16

STORAGE

Why social housing needs a different approach to storage

Page 42

EV

Why tomorrow's best EVs will be energy transformers

Page 52

The ACR & HEAT PUMP Trainee Of The Year Awards

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2026

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The ACR Journal

Heat Pumps & Renewables

JOIN US IN CELEBRATING THE NEXT GENERATION OF INDUSTRY STARS ON 3rd DECEMBER 2026!







Welcome to the first issue of Heat Pumps & Renewables Journal

Welcome to the inaugural issue of Heat Pumps & Renewables Journal (HPR).

Our new-look publication has been shaped by the changing needs of the market, alongside extensive consultation with our readers, advertisers and industry partners. The result is a refreshed magazine with an expanded scope, enhanced content and a new visual identity that better reflects the direction of the rapidly evolving renewables sector.

Investment

We have made significant investments across our print, website and digital platforms, while also broadening the magazine's coverage to reflect the increasingly interconnected nature of the industry.

It has become clear that the integration of heat pumps, solar PV and battery storage, the industry's "Golden Triangle", is playing an increasingly important role in helping homeowners and businesses improve energy efficiency, reduce emissions and achieve their sustainability goals.

We now offer an enhanced 64-page format, published 10 times a year, in both print and digital editions, reaching more than 15,000 installers and specifiers across the sector.

What's Inside

This issue is packed with informative, thought-provoking and practical content covering the wider renewable-energy landscape. Here is a selection of the features and expert insight included in this edition.

SOLAR

Steve Donovan, Head of Technical (UK & Ireland), and Giulio Stangarone MIET, Technical Engineer, both of Segen Ltd., examine how oversizing solar PV arrays can increase energy generation, improve system efficiency and maximise the value delivered by renewable-energy installations.

Will White, Senior Product Manager at Fluke Corporation, asks an increasingly important question: as data centres continue to outgrow the grid, could solar provide part of the answer?

HEAT PUMPS

Nathan Tranter, Head of Heating Sales at Panasonic Heating & Cooling, explores smarter heating solutions for a new generation of commercial buildings.

Meanwhile, Ian Rose, Managing Director at Passiv UK, explains why better use of data could hold the key to improving the performance of heat pump installations in homes.

Ian Trott, Head of Training at Baxi, looks at the areas where air source heat pump (ASHP) installations can most commonly be improved, helping installers achieve stronger system performance and greater customer satisfaction.

TRAINING

James Graham, Managing Director of Bitzer UK, examines why training, technical support and industry collaboration will be just as important as technological innovation in delivering the UK's low-carbon heating ambitions.

STORAGE

Angus Flett, CEO of Kight Powerhubs, discusses why home energy storage is becoming increasingly central to the flexible, low-carbon home.

He also explores why deploying battery storage across social housing requires a different approach from the traditional homeowner market, with safety, insurance, whole-life costs and comprehensive lifecycle support all needing to be considered from the outset.

GOLDEN TRIANGLE

"Intelligent Energy: Unleashing the Power of the Golden Triangle" is this month's focus from Cameron Beech, Head of Product Management & Training at Viessmann Climate Solutions UK.

Meanwhile, Iván Castro, Managing Director at Levelise, examines why the next major challenge may not be installing individual technologies, but ensuring they work together intelligently and effectively.

EV

Reuben Elman, Infrastructure Strategist at Formula Space, looks at businesses that are successfully turning to batteries and energy-storage solutions as a viable alternative to waiting for a traditional grid connection.

We also take a closer look at a low-carbon energy project delivered by Nuvolt. The Vale Resort has strengthened its sustainability strategy through the installation of solar PV and EV charging infrastructure, helping to reduce emissions while supporting its long-term environmental objectives.

EVENTS

Entries are now open for the National ACR & Heat Pump Awards, bringing together industry leaders, manufacturers, contractors, consultants and innovators from across the HVACR and renewables sectors.

Taking place at The Midland Hotel, Manchester, on 3 March 2027, the awards will celebrate the outstanding achievements, innovation and excellence that continue to drive our industry forward.

For full details and to enter, visit: **www.acrjournal.uk/national-acr-heat-pump-awards**

Looking Ahead

The renewable-energy sector is evolving rapidly, and so is Heat Pumps & Renewables Journal. Our aim is to provide installers, specifiers and other industry professionals with the knowledge, insight and practical information they need to navigate this changing landscape.

We hope you enjoy this first issue and find it both informative and valuable. We look forward to continuing to bring you expert perspectives, industry developments and practical solutions throughout the year.

Many thanks to the HPR team, and in particular to David Crowson for his help in brining this fantastic issue together.

Juliet

Juliet Loiselle FinstR, Editor/Publisher



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Visit www.acrjournal.uk/information/national-acr-heat-pump-awards or email Hayley Comey on hayleyc@warnersgroup.co.uk to find out more

Contents *September 2026*

NEWS

06 We highlight what's been happening in the Heat Pumps and Renewables sector

08 MCS – discusses rolling out it's redeveloped installer scheme

ADVERTORIAL

10 EcoFlow – brings its latest home energy innovations to Solar & Storage Live

30 Easy PV – reducing your admin drag and generate qualified leads

58 Mounting an Air Source Heat Pump – answers to some frequently asked questions

63 STIEBEL ELTRON Toolbox – unlock more opportunities

FEATURES

12 Future Homes Standard – designing, planning and building low-carbon, connected communities

41 Skills first – training, support and collaboration as important as technology to deliever low-carbon ambitions

56 Combining heat pumps with other technologies is vital in the current market

60 When customers go silent – top tips if payment chasing drags on

SOLAR

14 Oversize a solar arrays – can boost energy output, improve efficiency and maximise the value of renewable energy systems

16 Data centres are outgrowing the grid – is solar the answer?

18 Plug-in solar – a golden opportunity for the UK energy market

20 Project – delivering 132kV connection from concept to energisation

SOLAR & STORAGE

22 Sustainable energy solutions - delivering ROI beyond carbon reduction

HEAT PUMPS

24 Decarbonisation & green energy – the impact on water safety

26 Smart heating – a new era of commercial buildings

28 Air Source Heat Pumps – where installations can be improved

32 Why data holds the key to better-performing heat pump homes

34 Comfort controls – the next opportunity for heat pump installers

36 Low carbon homes need shared energy infrastructure, not just heat pumps

38 Designing quiet heat pumps – minimise vibrations

39 Replacing gas heating – delivers £2m saving for decarbonisation project

STORAGE

42 Why home energy storage is becoming central to the flexible, low-carbon home

GOLDEN TRIANGLE

44 Intelligent energy – unleashing the power of the Golden Triangle

46 Why the next challenge isn't installing technology – it's making it work together

48 Connected home energy – creating new opportunities for installers

EV

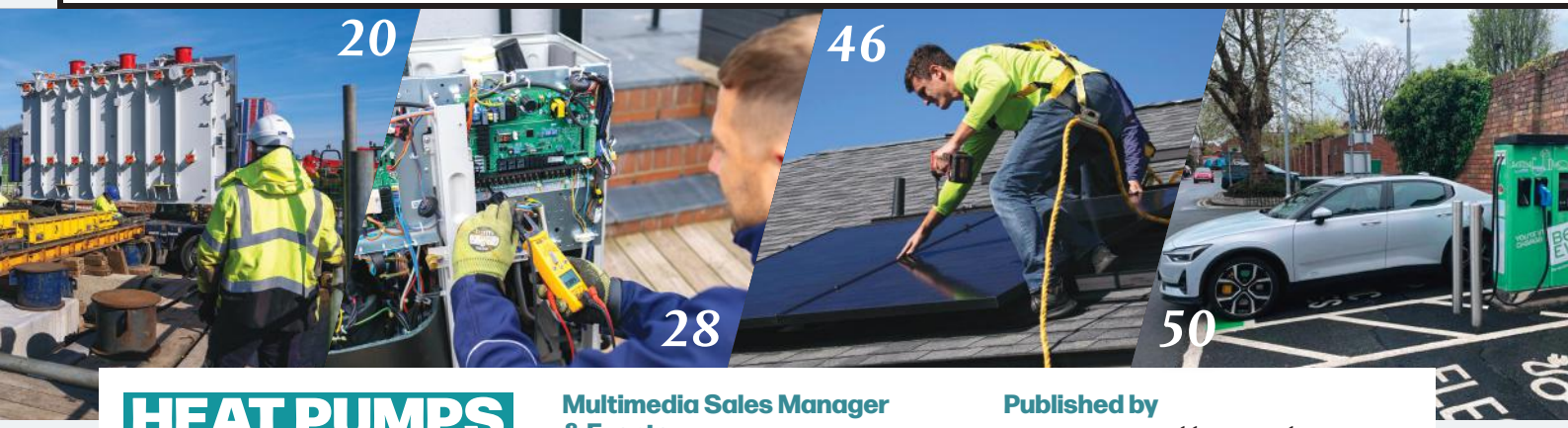
50 Grid connection – it's not the only path to high-performance charging

52 Not just a car – why tomorrow's best EV's will be energy transformers

55 Project strengthening sustainability strategy with low-carbon energy investment

WHAT'S NEW

62 What's new in the Heat Pumps and Renewables sector



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Published by
Warners Group Publications Plc
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Bourne, Lincs, PE10 9PH
01778 391000 / 01778 394748
www.warnersgroup.co.uk

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Printed by
S&G STEPHENS & GEORGE PRINT GROUP

NEWS



SOLAR INSTALLATIONS HIT RECORD HIGHS

Record high numbers for Solar

Families and businesses across the UK are embracing solar power in record numbers as plug-in solar panels become legal across Great Britain.

New government data published today shows nearly 172,000 solar installations have been fitted across the UK since the start of 2026. The surge follows the third-highest month for solar installations on record. Nearly 28,000 installations were completed across homes, businesses and larger-scale projects in July 2026, behind only March and June this year.

More than 19,800 rooftop solar panels were installed in July alone - equivalent to 1 installation every 2 minutes.

For the first time, the government is unveiling a regional breakdown of Britain's solar revolution, revealing which parts of the country are making the switch to clean power.

The UK's top 5 regions for solar deployment were:

- South East: 22,628 installations this year, taking the total to 305,101 installations, an increase of 14% since last July
- South West: 17,539 installations this year, taking the total to 271,400 installations, an increase of 13% since last July
- East of England: 18,109 installations this year, taking the total to 241,195 installations, an increase of 15% since last July
- East Midlands: 15,981 installations this year, taking the total to 182,606 installations, an increase of 17% since last July
- North West: 15,927 installations this year, taking the total to 186,253 installations, an increase of 16% since last July

Energy Minister Michael Shanks said:

Record numbers of families are installing solar panels to generate clean, homegrown power, helping them cut their energy bills. And through our Warm Homes Plan, we will upgrade homes, tackle fuel poverty and make rooftop solar more affordable for families.

Now, by making plug-in solar available across Great Britain, we're making it easier than ever for more families to benefit from Britain's solar revolution.

Solar installations increased in every UK nation and English region over the last 12 months. Wales recorded a 18% rise, Scotland grew by 14%, while installations in the North East increased by 11%.

The increase in solar installations comes as major retailers including Currys, B&Q, Screwfix and Amazon prepare to offer plug-in solar panels following changes introduced by government.

www.gov.uk/government/news/first-regional-solar-breakdown-as-installations-hit-record-highs

Zestec Renewable Energy and Ikigai Energy to deliver airside 10MWp solar farm at London Luton Airport following competitive win

Zestec Renewable Energy ("Zestec"), owned by funds managed by Octopus Energy Generation, and co-developer Ikigai Energy ("Ikigai") have begun construction activities on a 10.42 MWp solar photovoltaic installation at London Luton Airport ("LLA"), following their selection through a competitive procurement process launched by the airport operator.

The project will be delivered under a long-term Power Purchase Agreement ("PPA"), enabling LLA to benefit from on-site renewable electricity without the need for upfront capital investment. The project is expected to reach full electrification in early 2027, with Ryebridge Construction appointed principal contractor, working in conjunction with specialist delivery partners Emtec Energy and Emtec Utility Services.

The 106,000 m² ground-mounted array, comprising 14,580 solar modules, will be located entirely airside at the southern end of the airfield, spanning five development areas.

The solar plant is projected to generate up to 11.2 GWh of electricity annually, delivering a first-year carbon saving of approximately 1,467 tonnes CO_2e. The project forms a cornerstone of LLA's Responsible Business Strategy to reduce reliance on grid power and improve long-term energy resilience and decarbonise the airport's direct operational emissions, objectives that have become increasingly important as wholesale electricity prices continue to fluctuate in response to geopolitical instability and wider energy market pressures.

www.london-luton.co.uk



ECA: data centre growth must not outpace grid capacity or skills supply

Electrical Contractors' Association (ECA) has welcomed the approval of a new datacentre in west London, but warned that rapid expansion must be matched by sufficient grid capacity and a skilled electrical workforce.

ECA said datacentres can bring major economic opportunities for UK engineering services businesses, from construction and installation to long-term maintenance and specialist technical work. However, councils and government must ensure projects are planned responsibly, so they do not place unsustainable pressure on local electricity networks or compete with other national priorities, such as housing and clean energy infrastructure.

ECA has already begun work with industry and government on the skills and supply chain challenges linked to datacentre growth. Its recent datacentre skills roundtable, held with BESA, brought together senior business leaders, government departments, Skills England, industry bodies and major contractors to discuss workforce planning, competence, apprenticeships, commissioning and routes into the market.

Another ECA initiative – Electrotechnical Training and Careers Alliances (ETCAs) – bring together ECA Members, training providers, regional authorities, industry bodies and other stakeholders to address local electrical skills issues. The fourteen regional ETCAs established so far include the Thames Valley and Local London which covers east London and surrounding areas.

Andrew Eldred, Managing Director at ECA, said: "Datacentres are critical to the UK's digital economy and can create significant opportunities for electrical and engineering services businesses.

"But they must be delivered safely, sustainably and with proper regard for local grid capacity. These are complex, safety-critical projects that depend on competent businesses and properly skilled workers.

"ECA supports responsible datacentre growth. We want our Members to be at the heart of this opportunity, but it must not come at the expense of grid resilience, local communities or other national infrastructure priorities.

"That is why ECA is already working with Members, national and local government, skills bodies and industry partners to identify the workforce and supply chain measures needed to deliver this market at scale."

www.eca.co.uk/

EUA welcomes new President



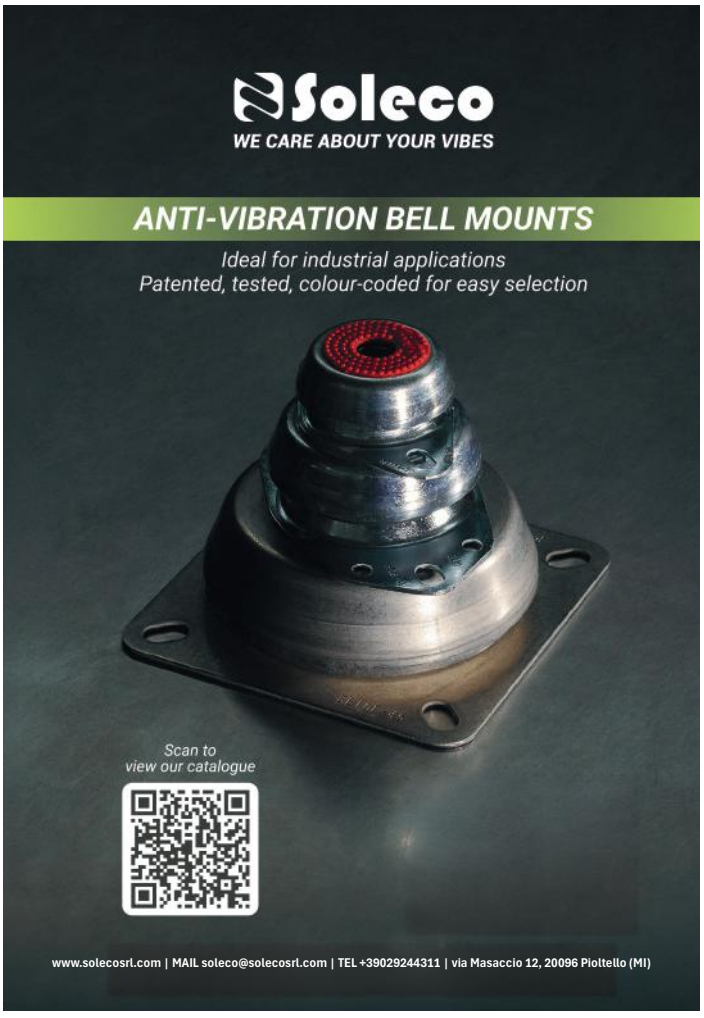
Following its AGM, EUA (Energy and Utilities Alliance), has announced its new President. **Henrik Juhl Hansen**, Managing Director of Vaillant Group UK & Ireland, and a senior industry leader at the forefront of shaping the energy transition, takes the helm for the next twelve months.

Welcoming the election of the new President, **Mike Foster** the CEO of EUA said: "Henrik is a strong advocate for a pragmatic, whole-system approach to decarbonising heat. He believes that there is no single solution, and that progress will depend on a balanced mix of technologies, supported by clear policy, long-term investment and a resilient energy system. This is the very essence of what EUA calls for.

"Henrik has already played a key role in the rebranding of EUA and we look forward to building upon our strengths, guided by his 30 years of international leadership, to make sure EUA remains the body where the whole of the heating industry is given a voice."

The new President of EUA, Hansen said: "I look forward to the fresh challenge of being President of EUA, a trade body that can look back over 100 years of history and looks forward to meeting the challenges of the energy transition. Working with over 250 member companies is a privilege and a great responsibility as we drive forward with the changes the UK needs in adapting to a low carbon future."

www.eua.org.uk



Raising the bar for consumer protection

MCS (Microgeneration Certification Scheme), the UK's quality mark for small-scale renewables like solar panels and heat pumps, is now rolling out its redeveloped installer Scheme which includes a new suite of protections for consumers.



Lisa Cooke, Managing Director at MCS

Lisa Cooke, Managing Director at MCS, explains how these requirements and formal recognition from the Department for Energy Security and Net Zero (DESNZ) has reinforced MCS's new role as a consumer protection organisation, as well as a standards body.

Renewables are going from strength to strength in the UK, with the first half of 2026 the best ever for MCS certified installations. Solar panels surpassed 2 million total installations, and battery storage installations in the first six months of this year have almost equalled last year's annual record.

As installation volumes rise, certification is crucial to giving consumers confidence in what are likely to be unfamiliar technologies, and providing assurance that protections are in place if something were to go wrong – all key to the continued growth of the industry. That's why the redeveloped installer Scheme includes new, robust requirements for consumer protection.

Putting consumer protection at the heart of what we do

MCS has two roles in the industry – to set standards for low-carbon technologies and to provide consumer protection. MCS certification itself is a level of protection for households, demonstrating that you use products that have been designed, tested, and installed to industry-reocgnised standards. However, the redeveloped Scheme goes even further to protect consumers and provides the assurances needed to give them confidence to invest in renewable technologies.

For every domestic installation, installers will need to purchase an MCS approved financial protection product. They provide your customers with a higher standard of protection, including a guarantee of remediation for issues even if an installer goes out of business and cover for at least six years (far above the two-year standard minimum).

For installations businesses, they provide an effective safety net if something goes wrong, reduce ongoing liability thanks to dependable remediation pathways, and provide a competitive advantage for certified installers.

With MCS now managing complaints in-house, MCS is the single point of contact for consumers to report concerns about their installation if an agreement cannot be reached with their installer. This streamlines the process and allows us to support both consumers and MCS installers in reaching an acceptable outcome for all parties. If a resolution can't be determined, cases will be referred to free and binding alternative dispute resolution (ADR).

MCS will also be reaching out to every recipient of an MCS certified installation, asking about their experience and helping to drive continuous improvement across our installer base.

Formal recognition

In June, DESNZ formally recognised the consumer protection offered by the redeveloped installer Scheme as a Code of Practice for the Boiler Upgrade Scheme (BUS), This means that, if an MCS certified installer is operating under the redeveloped Scheme, they no longer require membership to a consumer code to deliver installations under the Boiler Upgrade Scheme.

An evolving industry

With renewables continuing to break records in the UK, ensuring that consumers feel protected and reassured in their investment is crucial to the continued confidence in home-grown energy. That is what MCS's redeveloped installer Scheme aims to do.

As our current installer base works to the deadline of 31 March 2027 to move over to the redeveloped installer Scheme, installers looking to become certified for the first time will do so under the redeveloped Scheme.

We encourage installers to learn more about how the redeveloped Scheme can benefit them and to prepare for the changes with the resources available on the MCS website.

To find out more about how to get your business MCS certified, you can access MCS' free interactive guide here: **www.mcscertified.com/installers/view-our-guide-to-certification.**



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EcoFlow brings its latest home energy innovations to Solar & Storage Live

The UK residential energy market is evolving rapidly. Solar adoption continues to grow, battery storage is becoming increasingly mainstream, and homeowners are looking beyond individual products towards smarter, more integrated ways to generate, store, and manage energy.

For installers, that creates a significant opportunity – but also increasingly varied customer requirements.

At Solar & Storage Live Birmingham, EcoFlow will showcase the latest developments in its residential energy portfolio, with a particular focus on the OCEAN 2 Series, its new 8kW battery solution, and OASIS 3 intelligent home energy management.

Visitors will be able to get hands-on with the technology, speak directly to the EcoFlow team, and explore how the company is developing an increasingly comprehensive ecosystem for the professional installer market.

Building for the next generation of home energy

EcoFlow has grown from a global portable power brand into a broader energy technology company, with solutions spanning portable energy, solar generation, residential battery storage, backup power, and intelligent home energy management.

Within the professional residential market, the focus is increasingly on creating flexible systems that can respond to different properties, consumption patterns, and levels of electrification.

As EVs, heat pumps, solar PV, dynamic tariffs, and battery storage become more interconnected, installers are no longer simply specifying individual pieces of hardware. Increasingly, they are being asked to create an energy ecosystem around the home.

That is where EcoFlow's latest residential technologies come together.

OCEAN 2: designed for whole-home energy

At the centre of EcoFlow's presence at Solar & Storage Live will be the OCEAN 2 Series, its latest generation of residential solar and storage technology.

Designed around flexibility, performance, and ease of installation, OCEAN 2 provides a scalable platform for households looking to increase solar self-consumption, reduce reliance on the grid, and build greater energy resilience.

Its modular architecture allows installers to configure systems according to the requirements of individual properties and expand storage where required.

The battery technology is designed for long-term residential use, with 10,000-cycle LFP cells and nine layers of safety protection, while the physical design has also been developed with installers in mind.

For installers, those practical considerations matter. As demand for residential batteries increases, installation time, system flexibility, commissioning, and long-term reliability all have a direct impact on the viability of a project.

Solar & Storage Live will give installers the opportunity to examine OCEAN 2 in person and discuss system configuration and potential applications directly with EcoFlow's residential energy team.

Introducing EcoFlow's new 8kW battery solution

The show will also provide installers with the opportunity to discover EcoFlow's new 8kW battery solution, expanding the company's offering for UK households with greater power requirements.

As home electrification increases, residential energy systems are being asked to do more.

Electric vehicles, heat pumps, induction cooking, and other high-demand appliances are changing household load profiles, while customers are increasingly interested in using more of their own solar generation and reducing exposure to peak electricity prices.

The new solution has been developed with these changing requirements in mind, giving installers another option when designing residential systems around higher household demand.

Visitors to the EcoFlow stand will be able to learn more about the system, its applications, and how it fits within EcoFlow's wider residential energy portfolio.

SOLAR & STORAGE LIVE UK

22–24 September

NEC, Birmingham UK



OASIS 3 - making home energy smarter

Generating and storing energy is only part of the equation. Increasingly, the real value comes from deciding when and how that energy should be used.

EcoFlow will therefore also showcase OASIS 3, its latest intelligent home energy management technology.

OASIS 3 is designed to bring different elements of the household energy ecosystem together, helping optimise solar generation, battery storage, household consumption, and electricity tariffs.

As dynamic and time-of-use tariffs become more prevalent, intelligent energy management can help households make better use of periods of low-cost electricity while reducing grid consumption when prices are higher.

For installers, this represents an important evolution in the customer conversation. Battery capacity and inverter output remain fundamental, but software and energy optimisation are becoming increasingly important parts of the overall proposition.

The result is a move from installing standalone technologies towards creating an integrated home energy system capable of responding intelligently to how a household actually uses power.

ECOFLOW

Explore the EcoFlow Stand

#G28, Hall 20

NEC, Birmingham

September 22-24, 2026

One portfolio, different household needs

Alongside its professional residential solutions, EcoFlow will also have technologies from its wider energy ecosystem on display, including the recently launched STREAM Series.

Together, the portfolio reflects EcoFlow's broader approach to home energy: different households have different requirements, and the industry needs solutions capable of addressing that diversity rather than relying on a one-size-fits-all model.

Meet EcoFlow at Solar & Storage Live

For installers, Solar & Storage Live is ultimately about seeing the technology, asking technical questions, and understanding which solutions could work for their customers.

The EcoFlow team will be available throughout the show to discuss the OCEAN 2 Series, new 8kW battery solution, OASIS 3, system design, installation, commissioning, and the company's growing presence within the UK professional energy market.

Whether you already work with EcoFlow or are exploring the brand for the first time, visit the EcoFlow stand at Solar & Storage Live Birmingham to see the latest residential energy technology in action and meet the team behind it.

GET IN CONTACT:
https://energy.ecoflow.com/uk

Designing, planning and building low-carbon, connected communities

By **Adam Tkacz**, Business Development Director – Sustainable Heat, GTC.

For architects and the wider housebuilding community, the Future Homes Standard is a major milestone for residential development in the UK. New homes will be expected to deliver 75-80% lower carbon emissions compared with homes built under 2013 regulations, fundamentally changing how developments are designed, serviced and delivered.

The challenge for the sector is no longer whether low-carbon development is coming, it is how quickly the industry can adapt its design, infrastructure and delivery models to meet it.

For architectural technologists and housebuilders alike, this transition extends far beyond replacing gas boilers with heat pumps. It demands a complete rethink of how utility infrastructure is planned at the earliest stages of development, how communities are connected to energy systems, and how future resilience is embedded into residential placemaking.

At the heart of this shift lies one critical question: can the traditional approach to utilities still support the homes of the future?

Historically, utilities have often been treated in siloes within development programmes. Electricity, gas, water, fibre and heating infrastructure were typically designed independently, procured separately and delivered sequentially. That model is becoming incompatible with the Future Homes Standard.

The removal of fossil-fuel heating from new homes means electricity demand across developments will rise significantly as heating, hot water, electric vehicle charging and smart technologies become electrified. At the same time, planning policy and consumer expectations are driving higher standards of energy efficiency, renewable integration and digital connectivity, creating a new level of complexity for development teams.

Architectural technologists should now start to coordinate building fabric performance, ventilation systems, thermal modelling and low-carbon heating strategies in parallel with utility infrastructure design. Housebuilders, meanwhile, face growing pressure to deliver compliant homes while protecting programme certainty, controlling costs and maintaining viability.

What's becoming clear is utilities can no longer be considered as late-stage technical requirements - they must become a core part of strategic master planning from day one.

Why heat networks are gaining traction and moving into the mainstream

While individual air source heat pumps will play an important role in the transition to low-carbon housing, they are unlikely to be the optimal solution for every development type.

Residential schemes, mixed-use communities and large-scale strategic developments require more scalable and efficient solutions, and this is where low-carbon heat networks are becoming increasingly important.

The Future Homes Standard explicitly identifies heat networks as one of the principal technologies capable of delivering compliant low-carbon heating for new homes.

Modern heat networks differ significantly from legacy district heating systems of the past. New-generation networks can integrate ambient loops, networked ground source heat pumps, and renewable energy sources to create highly efficient, flexible energy systems across entire communities. What's more, they are being rolled out on low- and high-density schemes.

For developers, the benefits are substantial.

A well-designed low-carbon heat network can:

- Reduce peak electricity demand across developments
- Support future grid resilience
- Improve long-term operational efficiency
- Enable phased expansion across strategic sites
- Provide greater flexibility for planners and architects
- Reduce the spatial constraints associated with individual plant systems

Importantly, heat networks also support a more holistic placemaking approach.

Rather than treating each dwelling as an isolated energy asset, networked systems enable developments to operate as connected communities with shared infrastructure capable of evolving over time.



Adam Tkacz, Business Development Director – Sustainable Heat, GTC

For architectural technologists, this opens new opportunities to integrate energy strategy directly into the design narrative of developments, influencing everything from building orientation and massing to utility corridors and public realm planning.



The infrastructure challenge behind net zero housing

One of the biggest risks facing the sector is underestimating the scale of infrastructure transformation required to support electrified housing.

As the industry moves away from gas, electricity networks will experience unprecedented pressure. Developments designed around individual heating systems alone may encounter challenges relating to grid capacity, reinforcement costs and connection delays. This is already emerging as a major concern across the housebuilding sector.

Future-proofed developments will therefore require smarter approaches to infrastructure integration, as opposed to simply more infrastructure. This is where the multi-utility model becomes increasingly valuable.

By coordinating electricity, water, fibre and low-carbon heat infrastructure through a single integrated delivery model, developers can unlock significant efficiencies in both design and construction.

Instead of multiple contractors excavating the same roads and footpaths at different stages, integrated utility delivery enables infrastructure to be planned, installed and managed cohesively.

The result is reduced disruption, improved programme certainty and better long-term asset performance. More importantly, integrated multi-utility infrastructure creates the foundation for genuinely smart communities.

As homes become increasingly connected and data-driven, utility systems will need to interact seamlessly. Energy management, heating optimisation, EV charging and digital monitoring will all rely on coordinated infrastructure ecosystems rather than standalone networks.

The Future Homes Standard is therefore accelerating a much broader evolution in residential development, from disconnected housing sites to integrated low-carbon communities.

The opportunity beyond compliance

While much of the conversation around the Future Homes Standard focuses on regulation, the real opportunity is much larger.

The UK is entering a new era of residential development where energy resilience, digital connectivity and low-carbon infrastructure will become defining characteristics of successful communities.

Consumers are becoming more aware of operational energy costs, sustainability performance and long-term home resilience. Investors and local authorities are placing greater emphasis on ESG outcomes and future-ready infrastructure. At the same time, national net zero targets continue to reshape planning and development policy.

In this environment, low-carbon heat networks and integrated multi-utility infrastructure are not simply compliance mechanisms, they are strategic assets. They enable developers to differentiate schemes, improve long-term value creation and build communities capable of adapting to future technological and environmental change.

For architectural technologists, this represents an opportunity to play a far more influential role in shaping how future communities function, perform and evolve.

And for housebuilders, it reinforces an increasingly important reality: the homes of the future will only be as resilient as the infrastructure that supports them.

The Future Homes Standard may have accelerated the timeline for change, but it has also created an opportunity for the industry to rethink residential development; moving beyond isolated buildings towards integrated, low-carbon communities designed for the next generation.

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Why and when should you oversize a solar array?

Steve Donovan, Head of Technical (UK & Ireland) and **Giulio Stangarone** MIET, Technical Engineer, both of Segen Ltd., discuss that oversizing solar PV arrays can boost energy output, improve efficiency and maximise the value of renewable energy systems.



Steve Donovan, Head of Technical (UK & Ireland) at Segen Ltd.



Giulio Stangarone MIET, Technical Engineer, at Segen Ltd.

When designing an effective solar photovoltaic (PV) system, it is well worth considering oversizing the array. This approach allows the system to generate power more consistently throughout the day, and maintain better performance during winter months. The result is higher overall energy output – and potentially more revenue too!

Inverters are rated by their AC output, which you'll find on the data plate. For example, a 3.6kW inverter can deliver a maximum 3.6kW of AC power to your customer and to the grid. However, most inverters will accept a higher kW DC input from the solar array relative to the AC rating of the unit. This means you can connect more solar panels to the same inverter – a strategy known as oversizing.

When designing a PV system, always consult the inverter data sheet. There you will find the recommended maximum DC input compared to the rated AC output, which can be as high as 150%, or even 200%. This headroom exists for a reason. Panels rarely operate at nameplate output. Temperature losses, seasonal irradiance, orientation and shading all eat into real-world performance. Designing at a 1:1 ratio assumes conditions that almost never occur. However, it's important to note that any oversizing must comply with the limitations set out by the manufacturer of your chosen product. It is also essential to review your plans with a relevant technical specialist before installation.

Design considerations: Hybrid inverters and east–west arrays

Oversizing is particularly beneficial when using a hybrid inverter with battery storage. As a rule of thumb, the default operation mode of many hybrid inverters is to charge the battery first and then export any excess energy. Once the battery is full, generation will drop to the maximum limit that you can export on the AC side.

It's worth noting that you won't get the full oversizing benefit from pairing a PV inverter to an AC-coupled battery inverter. In this setup, the bottleneck will be the rating of the PV inverter. While the AC-coupled battery inverter will be able to draw excess from the PV inverter's AC output, a system with separate AC-coupled inverters will not allow DC oversizing advantages in the same way a hybrid inverter does.

Oversizing is also particularly beneficial for east-west configurations. Typical solar systems are angled south to maximise irradiance at midday, but an east–west setup has some panels facing east and others facing west. The east-facing panels produce more energy in the morning, while the west-facing panels produce more in the afternoon, meaning the system never reaches the inverter's theoretical maximum DC rating.

East-west configurations are growing in popularity because they provide more energy outside peak hours, which can increase revenue from exporting to the grid and boost self-consumption. When designing such a system, remember to observe the inverter's minimum and maximum voltage limits constraints and keep the east and west arrays on separate MPPT trackers to ensure the correct performance of the system.

Grid benefits: Smoother energy supply

By undersizing the inverter, you are also doing a good deed by helping to reduce grid congestion. The wider, fatter generation curve from the solar system will result in more consistent energy to the grid and less peak inconsistent power. On a large scale, this helps grid operators by reducing the duck curve effect.

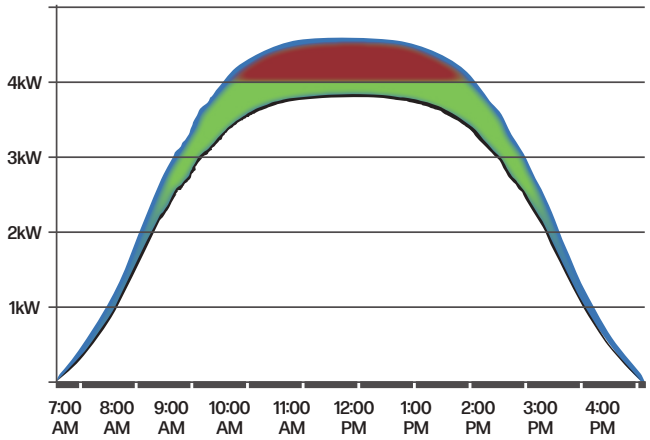
The duck curve describes the shape of daily electricity demand (excluding solar), specifically the difference from high demand to low demand. In the morning, when there is little solar, demand is stable, then at midday when all the solar is generating demand drops, only to rise back up to the daily peak in the late afternoon. These daily differences make energy trading complex and expensive as operators need to turn on peaking powerplants burning gas and biomass to cover the demand peak.

By oversizing solar arrays, you contribute, albeit modestly, to a smoother, more consistent power supply in the afternoon, helping delay the use of peaking plants. This effect becomes even more significant when paired with battery storage systems that trade energy.

Managing excess energy: Clipping

As mentioned previously, solar panels rarely operate at their nameplate output. However, in an oversized array, there are times—typically on very sunny days—when the panels can produce more DC power than the inverter can handle. The excess energy is managed through a process called "clipping."

During clipping, the inverter adjusts the maximum power point along the IV curve, with the MPPT (maximum power point tracker) deliberately operating at a slightly suboptimal voltage. This reduces the power drawn from the array, keeping the inverter within its AC rating. Any energy above this threshold is "clipped" and cannot be converted, although in systems with a hybrid inverter, the surplus can instead be directed to charge the battery.



Plot of solar generation through a sunny day: The lower line is a 4kWp array on a 4kWAC PV inverter, the higher line is a 4.8kWp array on the same 4kWAC PV inverter. The green area is the additional solar energy generated. The red area is the energy being clipped by the inverter.

Despite these brief losses, oversizing still increases total daily energy production and extends the periods during which the inverter operates at its maximum capacity.

The bottom line: More power, more cost effective

To conclude, there are numerous benefits to installing an oversized PV array. It allows for better utilisation of the inverter's AC rated output and can reduce the levelized cost of electricity produced. Additionally, the system owner can enjoy a more consistent output throughout the day and across the year. Pairing the system with a hybrid inverter and battery storage further enhances self-consumption, making the most of the energy your panels generate.

As always, ensure your design stays within the limits of the equipment. If you are unsure, refer to the manufacturer's specifications or design tools. Alternatively, reach out to Segen's technical team for guidance.

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Data centres are outgrowing the grid – is solar the answer?





Will White, Senior Product Manager at Fluke Corporation



Solar-plus-storage is helping data centre developers overcome grid constraints. **Will White**, Senior Product Manager at Fluke Corporation, explains that achieving long-term success depends on effective maintenance, planning and asset management.

There is a particular kind of meeting happening more frequently in data centre development right now. It involves a site that has planning, has land, has a committed customer – but no clear answer on grid power within the window the programme requires.

The options on the table are not comfortable ones: Wait for connection, redesign around what is available, or look seriously at generation assets that weren't in the original plan. Solar keeps coming up in those conversations, and it's no longer being brushed aside.

The scale of the pressure behind that shift is worth stating plainly. Research[1] from the UK Government revealed that in the first half of 2025 alone, the queue for data centres to connect to the grid grew by 460%. Currently, almost 6% of the UK's electricity is being consumed by data centres – nearly three times the global average. The increasing demand makes it clear that, for developers and operators, power availability is a first-order problem, not a planning assumption.

Solar's moment

Solar's appeal in this context is logistical. In the UK, it is one of the few generation sources that can still be built at meaningful scale on a timetable the market can actually use. The Government's Clean Power 2030 Action Plan[2] sets out a pathway to 45-47GW of solar by 2030, up from 18GW installed as of Q1 2025, alongside 23-27GW of battery capacity. Solar technologies are core to the system the UK is now trying to build, combining fast-deployable generation with the storage needed to make power usable at scale.

The storage pairing is what turns solar from an interesting option into a serious one. Utility-scale storage is now cost-effective, making it economical to charge batteries at peak solar times and discharge them later. For data centres specifically, that matters beyond simple load-shifting – batteries respond almost instantaneously to the short, sharp demand spikes that characterise high-density compute loads, reducing grid burden without compromising availability. On both speed and cost, the solar-plus-storage combination is about as close to a practical default as the current market offers.

A congested grid and a workable path through it

None of that makes the grid problem go away, however. As data centres continue to connect, already excessive queues will grow exponentially. This congestion will only serve to slow down integration and innovation. After all, if you can't connect, you can't deploy – and that applies to solar as much as anything else.

Solar-plus-storage gives developers another way to build a workable power mix while connection constraints remain in force. A co-located or nearby array paired with storage can reduce peak grid draw and buffer against supply volatility.

Fault isolation in a solar array tends to be sectional – a string or a block goes down, rather than the whole system – which means the resilience profile looks different from pure grid dependence. For developers navigating a congested connection environment, it changes the risk calculation.

Megawatts don't run themselves

A solar asset only becomes useful to a data centre strategy when the operating model around it is tight enough to trust.

That means thinking through the Operations and Maintenance (O&M) model before construction starts, not after. Who's doing the work, with what tools, against what monitoring thresholds, and with what plan when something goes wrong? Those questions need answers before the system goes live. The baseline you establish at commissioning matters too. I-V curve testing at that stage creates a performance reference you can actually measure drift against later; without it, you're troubleshooting without a baseline.

The spare parts question is less obvious but just as consequential. A colleague who runs an O&M company put it plainly: by the time you've finished building a utility-scale system, the manufacturers have often already moved on. Module formats change, inverter lines update, racking evolves – and within two or three years, the exact components you specified may no longer be readily available. At scale, that's a serviceability risk that belongs in the project economics from day one.

The skilled labour constraint sits alongside all of this. The solar workforce hasn't kept pace with deployment, and that gap shows up in O&M availability. Long-term performance depends on whether the operating discipline is genuinely in place; capacity on its own doesn't get you there.

The install-it-and-forget-it myth

For years, parts of the industry sold solar on terms that didn't hold up. Install it, connect it to monitoring, trust it to perform. I hate to admit it, but that included selling residential solar as an install-it-and-forget-it proposition – which has turned out to be very much not true. At utility scale, with generation feeding into a critical power strategy, the consequences of that mindset are larger.

The clearest signal that serious operators have internalised this is where O&M shows up in their financials. The companies getting this right are accounting for operational expenditure, labour, and maintenance cycles in their project models before financial close. That is the dividing line between a project that looks convincing on paper and one that keeps delivering in service.

Where the value holds or erodes

The power problem data centre developers are navigating isn't going away, and the grid alone isn't going to solve it on the timelines the market needs. Solar-plus-storage has earned its place in that conversation – on economic grounds and on the resilience profile it brings to a critical power strategy.

What that requires from developers is a different kind of discipline than the industry has historically applied to solar. The financial model has to account for O&M from the start. The operating decisions made at commissioning shape what the asset can do years later. And the gap between what gets built and what gets maintained is where the value either holds or quietly erodes.

www.fluke.com

Source

1. *https://www.gov.uk/government/news/government-to-tackle-speculative-demand-grid-connection-requests*
2. *https://www.gov.uk/government/publications/clean-power-2030-action-plan/clean-power-2030-action-plan-a-new-era-of-clean-electricity-main-report*





Plug-in solar presents a golden opportunity for the UK energy market

Aaron James Darvill, Strategic Sales Director at Anker, discusses that the government approval of plug-in solar could make renewable energy accessible to millions more UK households, creating new opportunities for consumers, installers and the wider industry.



Aaron James Darvill, Strategic Sales Director at Anker

The UK could be on the cusp of a 'renewable revolution' after the government's decision to give plug-in solar the green light.

The regulatory approval – which opens the door to people self-installing solar solutions on balconies and in other outdoor spaces, such as gardens and garage roofs – was granted at the end of August.

The hope is that these low-cost solutions could make renewable solar energy accessible to millions of households that have previously been priced out of traditional rooftop installations.

In June 2026, the government hosted an industry roundtable with some of the biggest retailers in the country, including Amazon, Asda, B&Q, Currys, Screwfix and Wickes, to iron out the details.

In a statement issued by the Department for Energy Security and Net Zero (DESNZ) at the time, **Graham Bell**, CEO of B&Q, said: "We are working closely with government and suppliers to understand and help shape the guidance, ensuring any products we offer are safe, compliant and straightforward to install."

Consumer demand

The reason that there is so much excitement about plug-in solar is that it addresses a part of the market that has, until now, been largely ignored.

Traditional residential solar has typically required homeowners to invest anywhere between £12,000 and £18,000 on average in roof-mounted panels, battery storage and an inverter. And, of course, it takes a professional to install and commission the system.

While the long-term savings of such roof-mounted solutions can be significant, the upfront cost – as well as having the right property – has kept these systems out of reach for many households.

That's why plug-in solar is such a game-changer. It creates a more affordable entry point for consumers who want to generate and store their own electricity but cannot justify the cost or complexity of a full installation.

Panels provide an affordable way to begin generating electricity, while modern lightweight batteries allow consumers to store surplus power and use more of it when they need it.

This modular approach means households can maximise the value of the energy they generate and expand their system over time.

What's more, it opens the market to huge numbers of people who have traditionally been excluded, including renters, people living in flats and apartments, as well as households in listed buildings or conservation areas.

Another key selling point is that it's flexible. It allows homeowners and renters alike to start with a smaller system that can be expanded over time.

These systems can flex in size as families grow and – just like a fridge or a washing machine – they can easily be unplugged and relocated when people move. For some, it could even work as a gateway to a full-blown roof installation.

Learning from Europe

While plug-in solar has only just been given regulatory approval in the UK, the technology is already well established elsewhere in Europe.

In Germany, for example, supportive legislation, high consumer awareness and rising electricity prices have helped drive rapid adoption over the past four years. But the biggest lessons have come first-hand from customer behaviour rather than sales alone.

As a leading solar battery storage brand, one of the things we've learned is that customers value reliability, peace of mind and above all, the simplicity of plug-in systems.

> ***"We are working closely with government and suppliers to understand and help shape the guidance, ensuring any products we offer are safe, compliant and straightforward to install."***

And once it's up and running, consumers want to understand how much electricity they are generating, storing and using, and how those decisions affect their energy bills. Watching those savings grow via an app quickly becomes part of the appeal.

Another observation I would make is that people rarely buy their "forever" system. Instead, they start small and expand over time as their circumstances change, adding more storage, additional panels or integrating other technologies as their energy needs evolve.

Creating opportunities for installers

Now, I'm conscious that all this talk of plug-in solar may ring alarm bells for some in our industry. But rather than competing with conventional rooftop systems, plug-in solar serves a completely different market.

In fact, I would go further and say that this creates opportunities for installers rather than taking work away from them. After all, most traditional solar companies would see little commercial value in a small two-panel installation on a balcony or garage.

However, consumers who want help installing or commissioning a plug-in solar system may still need the support of a qualified electrician.

Indeed, plug-in solar is likely to provide an entry point for electricians looking to diversify into renewable energy. By gaining experience with smaller systems, they can build the skills and confidence needed before moving into larger residential installations.

Rather than replacing the existing solar industry, plug-in solar has the potential to create an entirely new market alongside it.

Education is key

That's why education will play an equally important role in how quickly consumers embrace it.

Buying a plug-in solar system should be as straightforward as buying any other household appliance. Building that confidence will be essential if plug-in solar is to become a mainstream household technology rather than a niche product for early adopters.

But that will only happen if consumers understand how the technology works and what it can realistically deliver. And if that proves too much, then it's essential that they can seek the professional advice they may need.

In that regard, manufacturers, retailers, and installers all have a role to play. So too have utility companies.

Suppliers such as Octopus Energy have already demonstrated their effectiveness at engaging with consumers about dynamic tariffs and helping households think differently about how they generate, store and use electricity.

As plug-in solar becomes more widely available, utilities are ideally placed to become trusted advisers, helping customers select the right products, arrange installation and maximise the value of the electricity they generate.

At the same time, manufacturers have already invested heavily in developing products, retailers are preparing to bring them to market, and consumers are showing growing interest in lower-cost renewable energy.

The next chapter for home energy

At Anker SOLIX, for example, we've been preparing for the UK launch for the last 18 months. We have a range of solar balcony solutions available, including panels and batteries. Our engineers have tested different installation scenarios, developed technical support resources and planned for a range of possible regulatory outcomes.

And we are committed to working with the government, trade associations, retailers and customers dedicated to advance plug-in solar and storage safely and simply.

If plug-in solar succeeds in the UK, its impact is likely to extend well beyond a new category of consumer technology. It has the potential to change who can participate in the country's transition to renewable energy.

I truly believe that plug-in solar truly is the gateway to the democratisation of energy.

After all, across Europe, adoption continues to accelerate as consumers become more comfortable generating, storing and managing their own electricity.

New technologies – from solar roof tiles to solar fencing – are already beginning to emerge, with battery storage, AI monitoring and dynamic tariffs becoming increasingly integrated.

With clearer regulation, continued innovation and greater consumer confidence, plug-in solar has the impetus to become a mainstream part of home energy, giving millions of households a practical and affordable way to take greater control of the electricity they generate and use. And I, for one, cannot wait.

www.anker.com/uk



Taking the complexity out of High-Voltage grid connections

Grid connections are complex, costly and time-consuming – but developers don't have to navigate them alone. **Ashley Hutchinson**, Chief Operations Officer at Sinewave, explains how an independent connection provider delivered a solar project's 132kV connection from concept to energisation.



Ashley Hutchinson, Chief Operations Officer at Sinewave

The UK has no shortage of solar projects in the pipeline. With the government targeting 47GW of installed capacity, consented sites and secured Contract for Difference (CfD) contracts are stacking up, yet many generation projects are stalled by the problem of simply securing a grid connection. The final – and often biggest – hurdle to delivery is the high-voltage infrastructure needed to get power onto the network.

For most utility-scale solar projects, connection means working with the local distribution network operator (DNO). But the incumbents aren't always known for moving quickly, and they may not be the cheapest, fastest or most flexible choice. Developers can often get results by speaking to independent connection providers (ICPs), but many of these lack the expertise to operate at higher voltages such as 132 kilovolts (kV) – often a likely requirement for larger generation projects. Accordingly, it's important to pick a partner with the necessary expertise and the ability to move at pace.

At 132kV the technical demands escalate significantly, and the options available to developers aren't always well understood. At Gammaton Moor in Devon, a 35 megawatt (MW) solar farm developed by global renewable energy producer Sonnedix illustrates what becomes possible when an ICP has 132kV expertise in its wheelhouse.

Connections on the moor

Gammaton Moor is one of five sites in Sonnedix's 300MW UK solar portfolio, all contracted under CfD allocation rounds AR4 and AR5. Sonnedix, which has a total global capacity of approximately 10 gigawatts (GW) and a development pipeline exceeding 6GW, appointed Sinewave as the ICP to deliver the 132kV connection works for the Devon site.

The project required a turnkey approach: design and construction of a 132kV/33kV grid connection substation including a 34MVA transformer, a brick-built DNO switch room, over 500 metres of high-voltage cabling, and the full suite of protection, control and SCADA systems.

The design phase alone demanded a comprehensive programme of network studies including G99 compliance, fault level analysis, protection coordination, and harmonic and voltage-fluctuation assessments. Every element had to satisfy both the DNO's adoption standards and the long-term performance requirements of a facility designed to operate for decades.



Gammaton Moor in Devon, a 35 megawatt (MW) solar farm

Overcoming challenges

Sinewave mobilised in summer 2024. Its turnkey approach meant it could act as a single point of contact for the entire delivery chain. As principal contractor, the company managed civil engineering, electrical installation and commissioning as a single integrated programme, rather than a sequence of handoffs between separate contractors. The developer dealt with one organisation from first concept through to final energisation.

That integration proved critical when the project encountered two challenges that could have caused significant delays. The first was down to Gammaton's rural Devon location, at which mains water and sewerage connections would involve considerable additional expense and work. Rather than force an impractical utility connection, Sinewave worked with National Grid to design an alternative: a septic tank combined with a rainwater harvesting and filtration system to serve the site's welfare facilities.



132kV/33kV grid connection substation including a 34MVA transformer

This pragmatic engineering decision helped avoid weeks of delay and unnecessary cost.

The second was the energisation window. Coordinating with National Grid's outage schedule meant the window for energisation was fixed well in advance. To make the most of it, Sinewave carried out a partial energisation using a low-level disconnector, which allowed work to continue on the customer side of the site while the DNO connection went live. Without that decision, the programme could have faced months of delay waiting for the next available slot.

Beyond Gammaton

The full 132kV connection was energised in April 2026. The 34MVA transformer, DNO switch room, protection panels and cabling network were all live and performing to specification, enabling Sonnedix's facility to begin exporting renewable electricity to the national network. Once fully operational, the site is expected to power over 13,000 homes and avoid approximately 10,000 tonnes of carbon emissions annually.

The significance of the work at Gammaton extends beyond the specifics of a single solar farm in Devon. Indeed, Sinewave is Sonnedix's connection partner for the delivery of the 120MW South Oxfordshire Solar Farm, destined to be the largest plant in the business' UK portfolio. As the UK's connection queue undergoes its most significant reform in a generation, developers at every scale are being forced to think differently about how they get connected. The TM04+ reforms and NESO's gate process are designed to bring order to a system that had become gridlocked – but reforming the queue is not the same as building the infrastructure.

Sinewave's work at Gammaton demonstrates that an ICP with the necessary accreditation, design capability and construction expertise can deliver a 132kV connection on a turnkey basis. When connections remain congested and major projects are still at risk of slipping, having an experienced and dependable connections partner can be a commercial differentiator – and even the difference between a project being built or not.

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Sustainable Energy Solutions: Delivering ROI beyond carbon reduction

By **Mark Bramhall**, Director of Commercial Strategy at 'Plug me in'.

Energy costs are now one of the largest overheads for many businesses. Over a quarter of businesses (27%) say they are currently finding it difficult to pay their energy bills, according to new research from the British Chambers of Commerce (BCC). So, it is not surprising that, with rising overheads, changing regulations and increasing expectations from customers, investors and supply chain partners, businesses are having to rethink how they manage energy. However, Mark Bramhall, Director of Commercial Strategy at 'Plug me in', believes there is a clear opportunity for organisations to reduce costs and meet sustainability objectives at the same time.

Businesses of all types, from manufacturing facilities and warehouses to commercial buildings and retail sites, can benefit from technologies that reduce reliance on the grid and improve energy efficiency. The challenge is identifying the right solutions and implementing them in a way that delivers lasting value.

Renewable energy projects, unlike many business investments, often provide benefits across multiple areas simultaneously, meaning that on top of cost savings, organisations can also reduce carbon emissions, improve energy resilience and strengthen their environmental credentials; a combination of financial and environmental value that is becoming increasingly important in a business environment where sustainability performance is under greater scrutiny.

With solar module efficiency rising from around 17% to just under 25% over the past decade, stationary battery storage pack prices falling by around 45%, and optimisers improving panel-level performance, monitoring and shading resilience, businesses can now generate more on-site energy, store and use it more intelligently, and reduce reliance on higher-cost grid electricity. "We are now in a place where the technology has matured enough to make renewable energy a genuinely strategic investment," Mark explains.



Mark Bramhall, Director of Commercial Strategy at 'Plug me in'



"Very few business investments tick as many boxes as renewable energy. You reduce operating costs, improve energy security, strengthen ESG performance and often achieve an attractive return on investment from the same project."

The way to energy independence

While complete energy independence may not be achievable for every organisation, many businesses can substantially reduce their reliance on external energy supplies by taking a more joined-up approach to how they generate, store and manage energy. Smart monitoring tools provide visibility into consumption patterns, helping organisations identify opportunities for further optimisation.

For the customer, this means solar generation can supply electricity during daylight hours, while battery systems store surplus energy for later use. This integrated approach not only reduces energy costs, but also significantly improves resilience against market volatility and future energy price fluctuations.

One manufacturer's sustainability journey

For Display Mode, a manufacturing company based in Corby, the decision to invest in renewable energy was driven by two clear priorities: reducing carbon emissions and gaining better control over rising energy costs. After exploring alternative approaches to powering its manufacturing facility, the company concluded



"We are now in a place where the technology has matured enough to make renewable energy a genuinely strategic investment..."

that solar was the most effective way forward and invested in an 80.22 kWp solar PV system.

This installation now generates 65,139 kWh of electricity annually, significantly reducing the site's reliance on grid power and delivering estimated annual reducing energy costs by £17,000. Beyond the financial return, the system is also set to reduce carbon emissions by 12.05 tonnes each year. Over its lifetime, this equates to the environmental benefit of planting approximately 8000 trees.

As part of a wider sustainability strategy that included upgrades to building lighting and electrical infrastructure, these measures have helped create a more efficient operation while supporting the company's long-term environmental objectives. And with solar generation now in place, Display Mode has established a platform that can be built upon with future technologies such as battery storage, further enhancing energy independence and operational resilience.

For manufacturers and other energy-intensive organisations, this type of integrated approach highlights how sustainability investments can generate measurable returns while supporting broader business goals.

Value of an end-to-end approach

For many organisations, the installation of renewable energy and the predicted cost savings are the initial draw. However, the success of any renewable energy project depends not only on the technology selected, designed and installed, but also on how it is supported over time. Evaluating renewable technologies, forecasting performance and managing ongoing maintenance can be challenging without specialist expertise, but working with an end-to-end partner capable of supporting the entire project lifecycle can help alleviate these challenges.

An end-to-end approach begins with understanding the organisation's energy profile, operational requirements and sustainability objectives, ensuring the system is designed to maximise performance, carbon reduction and financial return. However, installation is only the starting point. "Too often, renewable energy projects are treated as finished the moment the system is installed," says Mark. "But these are long-term assets. The real value comes from making sure they continue to perform as intended year after year, with the right monitoring, maintenance and technical support around them."

This is what turns a solar or battery system from a completed project into a managed asset, protecting performance, savings and ROI over the long term. Access to technical expertise and 24/7 support can help organisations resolve issues quickly, minimise downtime and ensure systems continue operating efficiently throughout their lifespan. As battery storage, energy management software and smart grid technologies become increasingly sophisticated, organisations also benefit from trusted guidance to identify the most effective solutions.

A strategic investment

One thing Mark is clear on is that the conversation around renewable energy has fundamentally changed. What was once viewed primarily as a sustainability initiative is now a strategic business investment, delivering measurable financial, operational and environmental value.

For organisations willing to take a long-term view, technologies such as solar PV, battery storage and intelligent energy management provide an opportunity to reduce operating costs, improve resilience against volatile energy markets and strengthen environmental performance simultaneously. Few investments have the ability to lower overheads, protect against future risk and support ESG objectives in equal measure. "The organisations seeing the greatest success," says Mark, "are those that no longer view energy as a fixed cost to be managed, but as a strategic asset that can be optimised. The technology is proven, the commercial case is stronger than ever, and businesses that invest today will be better positioned for the challenges and opportunities of tomorrow.

www.plugmein.com



Decarbonisation & Green Energy – The impact on water safety

By **Andy Clews**, Senior Consultant Water Hygiene Centre.

Decarbonisation and green energy measures can have a major effect on water safety in buildings. Although they reduce carbon emissions, they may also create serious unintended risks, including increased growth of Legionella and other opportunistic pathogens caused by system stagnation, lower water temperatures, and reduced disinfectant residuals.

Core risks factors

Lower operating temperatures: Choosing heat pumps to be the primary heat source should be carefully managed if hot water at 60oC is to be achieved. The pasteurisation requirement should not be overlooked thus 70oC should be achievable. Heat pump performance varies with ambient conditions, building's actual heat demand, operating temperatures and with age so to optimise the heat pump benefits may require supplementary plant and equipment.

Reducing hot water storage temperatures may appear to be a simple way to cut energy use, but it involves more than adjusting the hot water generator set point. Lower temperatures can allow water to fall within the ideal growth range for Legionella bacteria.

ACoP L8 requires hot water to be stored at 60oC and delivered at 50oC at outlets, or 55oC in healthcare settings. Alternative control measures may be acceptable where a competent Legionella risk assessment or design review demonstrates that they are equivalent to, or better than, the ACoP L8 requirements.

Low-flow fixtures: Retrofitting existing plumbing with water-saving fittings, such as aerators, low-flow showerheads and dual-flush cisterns, can reduce water use but may also cause pressure drops, flow imbalance and blockages in domestic water and drainage systems. Reduced flow rates lower water velocity and shear stress, allowing biofilms to develop and sediment to accumulate, which can increase maintenance requirements and affect system reliability.



Andy Clews, Senior Consultant Water Hygiene Centre

Existing drainage systems are often sized for larger-volume cisterns, so replacing them with low-volume dual-flush units may provide insufficient water to clear waste effectively. This can lead to repeated flushing, which undermines the intended water savings.

Cold water storage: Storage calculations sometimes include allowances for future expansion, and tanks may be selected at the next size above the actual requirement, creating excess capacity. Adding low-flow fixtures to systems with oversized storage can further reduce turnover and increase the risk of stagnation.

Pipework distribution heat loss: Thermal insulation on hot water pipework reduces heat loss but does not eliminate it; similarly, insulation only slows heat gain in cold-water pipes. Increasing insulation thickness can further reduce heat loss or gain, but congested service routes and limited access may make this impractical. As an alternative to a large centralised hot water system with extensive distribution pipework, low-volume point-of-use water heaters may be considered, subject to the operational needs of the facility.

Rainwater harvesting and greywater systems

Buildings increasingly collect rainwater or recycle greywater (from sinks and showers) to flush toilets, irrigate landscapes and run cooling towers (subject to rigorous treatment and filtration). We do however need to look at the overall system and its detrimental impact such as additional plant and equipment bringing Cap Ex / Op Ex, extra space to be constructed and ongoing maintenance that increases the carbon footprint.

EA/NHBC/Energy Saving Trust believes such systems have a 30% higher carbon footprint. We're told that water-hungry data centres may increase demand for water. Some may have been installed with dry/wet cooling when they should have had evaporative cooling towers.

Cross-contamination is a severe hazard. If a physical cross-connection occurs between non-potable and potable water lines, pathogens or chemical contaminants can backflow into the drinking water supply. Furthermore, recycled water contains higher organic loads, accelerating bacterial multiplication if stored poorly therefore robust control strategies are required.

Solar Water Heating: Solar thermal collectors absorb sunlight to pre-heat domestic hot water, reducing the load on secondary heating systems.

Solar energy is intermittent. On cloudy days or during periods of low building occupancy, large solar pre-heat tanks sit lukewarm. This creates a highly vulnerable "lukewarm zone" where bacteria can thrive. The key is to ensure that the fluid in the solar panels heats the main hot water store indirectly and typically have a separate means of heating to top up when required. Suitability for the UK climate should be assessed with the contrast of seasonal weather patterns.

Mitigation strategies

In the modern built environment, changes that benefit one aspect e.g. net zero, can create risks elsewhere. Water systems should continue to comply with the Water Supply (Water Fittings) Regulations 1999 and the Approved Code of Practice and Guidance L8, Legionnaires' disease: The control of legionella bacteria in water systems.

Some mitigations are:

- Smart Monitoring: Implementing remote monitoring for water flow and temperatures reduces manual site visits while tracking stagnation in real time.
- Eco-Friendly Disinfection: Technologies such as copper-silver ionisation and Ultraviolet (UV) light are utilised to control biofilms and pathogens without relying on high temperatures or harsh chemical byproducts.
- Alternative Disinfection: Supplemental chemical water treatment, such as chlorine dioxide or copper-silver ionisation, can control bacterial growth at lower temperatures.
- Rigorous Filtration: Apply robust multi-stage filtration, UV disinfection, or disinfection to recycled water before storage.
- Strict Colour-Coding: Use distinctly marked, purple pipework or use copper pipe for domestic water and plastic for non-wholesome water for all non-potable water lines to prevent accidental cross-connections during maintenance.
- Air Gaps: Implement physical, non-mechanical air gaps (compliant with local water regulations) at all top-up connections between mains water and recycled water tanks.
- Automated Flushing: Install smart, sensor-activated flushing valves on low-use outlets to regularly purge stagnant water.

Conclusion

Before making changes to an existing water system, the overall impact should be risk assessed. Responsible and competent persons within the organisation should validate and authorise any planned changes to ensure water safety is not compromised in pursuit of energy savings. Green certification schemes, such as BREEAM or LEED, require robust Water Safety Plans that balance efficiency targets with public health legislation; however, these targets should never be achieved at the expense of user safety.

www.waterhygienecentre.com





Smarter heating for a new era of commercial buildings

By **Nathan Tranter** - Head of Heating Sales, Panasonic Heating & Cooling.

The commercial building sector is entering a period of profound change. From tightening carbon regulations and rising energy costs to evolving sustainability targets, building owners and developers are under increasing pressure to rethink how they heat, cool and manage their properties.

For many organisations, the conversation has moved beyond whether they should decarbonise. The focus is now on how to achieve it while maintaining occupant comfort, operational resilience and long-term return on investment.

Heat pump technology has emerged as one of the most effective pathways to reducing operational emissions, but success depends on more than simply replacing one heat source with another. It requires an integrated approach that combines efficient generation, intelligent distribution and smart controls.

At Panasonic, we are seeing growing demand for complete heating and cooling ecosystems that can serve everything from residential developments and offices to hotels, retail environments and mixed-use commercial projects. The latest generation of commercial heat pumps and smart fan coils has been designed specifically to address these challenges while helping customers prepare for a low-carbon future.

The growing need for centralised heat pump solutions

Across the UK, building owners are looking for alternatives to traditional fossil-fuel-based heating systems. However, commercial projects often present unique challenges. These may include varying occupancy patterns, large heating loads, space constraints, existing distribution systems and the need for domestic hot water production.

To meet these requirements, modern heat pumps must offer far greater flexibility than previous generations of technology. They need to perform reliably in demanding climates, integrate into both new-build and retrofit environments, and scale efficiently as building requirements evolve.

Panasonic's centralised heating solutions have been developed with this flexibility in mind. By harnessing renewable energy from the air and combining it with advanced heat pump technology, these systems can help reduce energy consumption and associated CO_2 emissions while providing heating, cooling and domestic hot water from a single platform.



Nathan Tranter - Head of Heating Sales, Panasonic Heating & Cooling

Why natural refrigerants matter

A key focus for the HVAC industry is reducing not only operational emissions but also the environmental impact of refrigerants themselves.

That is why Panasonic continues to invest in systems using R290, a natural refrigerant with an exceptionally low Global Warming Potential (GWP) of just 0.02 according to the IPCC Sixth Assessment Report. As regulations continue to drive the market towards lower-GWP solutions, natural refrigerants are becoming increasingly attractive for commercial applications.

The advantage is clear. Building owners can benefit from highly efficient heat pump technology while supporting wider sustainability objectives and helping future-proof investments against changing regulatory requirements.

Delivering commercial-scale performance

One example of this approach is Panasonic's ECOi-W AQUA-G EVO H R290 heat pump range.

Designed for larger commercial applications, the air-cooled system delivers cooling capacities from 57kW to 91kW and heating capacities from 61kW to 102kW. The combination of natural R290 refrigerant, inverter-driven scroll compressors and EC fan motors helps optimise seasonal performance while reducing energy consumption.

In commercial environments, efficiency is only one part of the equation. Reliability and performance in challenging conditions are equally important.

The heat pumps has therefore been engineered as a heating-optimised solution. Advanced refrigerant circuits, high-performance components and optimised defrost management enable the system to maintain strong performance even when outdoor temperatures fall significantly below freezing. The unit can produce domestic hot water at temperatures up to 75°C while also providing leaving water temperatures of up to 55°C at outdoor temperatures as low as -18°C.

This capability makes the technology suitable for a wide variety of applications where high-temperature performance remains a key requirement.

Scalability without compromise

One of the most important considerations in commercial building design is scalability.

Few buildings operate exactly as predicted over their entire lifecycle. Occupancy levels change, tenant requirements evolve and new extensions are often added over time. Heating and cooling systems therefore need to be adaptable.

The ECOi-W AQUA-G EVO range was designed with modularity in mind. Units can be combined in cascade configurations and managed through integrated control logic, allowing designers to increase capacity while minimising plant room requirements. The compact footprint also allows multiple units to be installed side by side with minimal spacing, making them particularly well suited to space-constrained projects.

"Success will depend on adopting technologies that deliver sustainability without sacrificing performance, comfort or practicality"

Supporting the retrofit opportunity

While new buildings represent an important opportunity for low-carbon heating, the greatest challenge lies within the existing building stock.

Many commercial and multi-residential buildings still rely on heating systems that were designed around traditional boilers and high-temperature water distribution. Replacing these infrastructures can be costly and disruptive.

This is where high-temperature heat pump technology becomes particularly valuable.

Capable of delivering water temperatures up to 75°C, Panasonic's Big Aquarea T-CAP M Series also maintains its rated heating output at a 55°C water outlet down to -15°C outdoor temperature without requiring a backup heater.

By delivering higher water temperatures, heat pumps can more easily integrate with existing radiators and hydronic systems, helping to simplify retrofit projects and accelerate the replacement of fossil-fuel heating systems.

The importance of intelligent heat distribution

Generating heat efficiently is only part of creating a comfortable and energy-efficient building. The way that heat and cooling are delivered throughout occupied spaces has an equally significant impact on overall performance.

This is where Panasonic's Aquarea Air Smart Fan Coil range plays an important role.

Designed to work alongside Aquarea heat pumps, these fan coil units provide both heating and cooling from a compact platform.

Traditional fan coil systems often rely on stepped fan speeds, which can create noticeable fluctuations in airflow and noise. Panasonic's Aquarea Air Smart Fan Coils use continuously modulated airflow with proportional-integral logic, enabling the unit to automatically adjust performance in response to room conditions. This results in quieter operation, smoother temperature control and improved occupant comfort.

Integrated DC inverter technology further supports energy efficiency, helping to minimise energy consumption while maintaining consistent indoor conditions.

As commercial buildings become increasingly intelligent, HVAC systems must also become more connected.

Today's facilities managers require access to real-time operational data, remote monitoring and seamless integration with building management systems. Panasonic's fan coil solutions support a range of control options including onboard controls, wall-mounted interfaces, Modbus communication, integrated Wi-Fi options and analogue control capabilities.

Combined with Panasonic's broader ecosystem of controls and energy management technologies, this creates opportunities to optimise performance, simplify maintenance and improve operational visibility across an entire building portfolio.

The transition to lower-carbon buildings is no longer a future ambition. It is happening now.

Success will depend on adopting technologies that deliver sustainability without sacrificing performance, comfort or practicality. Commercial heat pumps have evolved significantly in recent years, and today's solutions are capable of meeting the demands of even the most challenging applications.

By combining high-performance R290 heat pumps such as the ECOi-W AQUA-G EVO with intelligent room-level solutions like Aquarea Air Smart Fan Coils, building owners can create efficient, scalable and future-ready heating and cooling systems that support both environmental goals and business performance.

The opportunity for our industry is clear: to move beyond simply replacing heating systems and instead create smarter, more connected and more sustainable buildings for the decades ahead.

www.aircon.panasonic.eu/GB_en



Three practical ways to improve ASHP installations

Air Source Heat Pumps (ASHPs) have much in common with boilers, so most installers already have a strong base for adding them to their portfolio. **Ian Trott**, Head of Training at Baxi, explains where ASHP installations can most often be improved to deliver stronger performance and better customer satisfaction.

For experienced heating engineers, ASHPs should not feel like unfamiliar territory. The core disciplines still apply; accurate heat loss calculations, sound pipework design, suitable emitters, effective controls and a clear handover all remain central to the finished result. Boiler experience gives installers a strong base, particularly when they already understand the relationship between system design, customer comfort and long-term reliability.

The important difference is that ASHPs are less forgiving of assumptions. They operate at lower flow temperatures, depend on steady water movement, and rely on the homeowner understanding the controls. Get those details right and the installation is far more likely to perform as intended; miss them and the customer may notice quickly.

Pipe sizing and emitter selection matter

Heat loss calculations are the foundation of good heating system design, whether that system is connected to a gas boiler or a heat pump. That process is familiar and should give installers confidence, because it is not a new skill so much as a skill being applied with greater precision. The difference comes in how the calculation is used, particularly when selecting emitters and judging whether the existing pipework can support the required flow rates.

ASHPs run at lower flow temperatures than traditional boilers, which means the heat delivered into the property is less intense. To heat the same room to the same level of comfort, the system needs enough surface area to transfer that heat energy effectively. In practice, that may mean upsizing radiators or bringing underfloor heating into the design.

Pipe sizing deserves the same attention. Heat pumps typically need to move water around the system faster than a boiler, so larger pipes are often needed. That affects the installation route, and the way practical obstacles are handled on site. Routing 28mm or 32mm pipe through joists, cupboards and existing services requires planning before the job starts.

This is particularly important on retrofit work. With a boiler replacement, fitting a 30kW unit where a 28kW boiler used to sit is usually manageable, provided the wider design remains suitable. ASHPs are not quite so forgiving. If the existing pipework cannot carry the flow rates required, the system will struggle to deliver the performance the customer expects. Taking time to get this right protects the customer experience and the installer's margin, because remedial work after the event quickly eats into profit.



Ian Trott, Head of Training at Baxi



Treat ASHPs as a different running strategy

The biggest mindset shift, both for installers and homeowners, is how an ASHP is designed to run. A gas boiler and an ASHP can both provide heating, but they reach that outcome differently. If the system is commissioned or explained as though it behaves like a boiler, the homeowner is likely to use it in the wrong way and then question the performance.

Today's gas boilers are low content, meaning they hold smaller quantities of water than older models. They heat that water quickly, then transfer high-temperature heat into the property over a relatively short period. ASHPs work in the opposite way. They keep a larger volume of water moving steadily at a lower temperature, running for longer and maintaining comfort through consistency rather than short, high-output cycles.

That is where controls come into their own. Weather compensation is standard for ASHPs, adjusting the flow temperature according to outdoor conditions rather than waiting for the room thermostat alone to call for heat. Installers need a clear picture of how the homeowner will live with the system, because occupancy, comfort levels and room use all inform setup.

This can be one of the more rewarding parts of working with heat pumps. The technology responds well to careful design and commissioning, so the choices made before handover have a clear impact on running behaviour and customer confidence. It also rewards installers who take pride in the technical detail; the system is not simply fitted, it is tuned to suit the property and the people living in it.

Make the handover part of the installation

With a new boiler, many homeowners can manage with a brief explanation of the programmer, the thermostat and the pressure gauge. ASHPs need a more considered handover, because the best way to use the system is different from the heating habits many customers have built up over years of living with gas boilers. Assuming they will work it out for themselves is one of the most common ways a technically sound installation ends up generating unnecessary complaints.

Installers benefit from planning the handover as part of the job, not something squeezed in once the tools are packed away. It is good practice to walk the homeowner through how the system works, why it runs for longer periods, and what they should and should not do after the team has left site. Talking through the controls helps them have a clearer idea of what they will see across seasons.

Follow-up contact tends to pay for itself. A quick call or visit a few weeks after commissioning can catch small issues before they become complaints and gives the homeowner a chance to ask questions they did not think of during handover. That second conversation often builds confidence, particularly if the customer has noticed the unit run differently from the boiler it replaced.

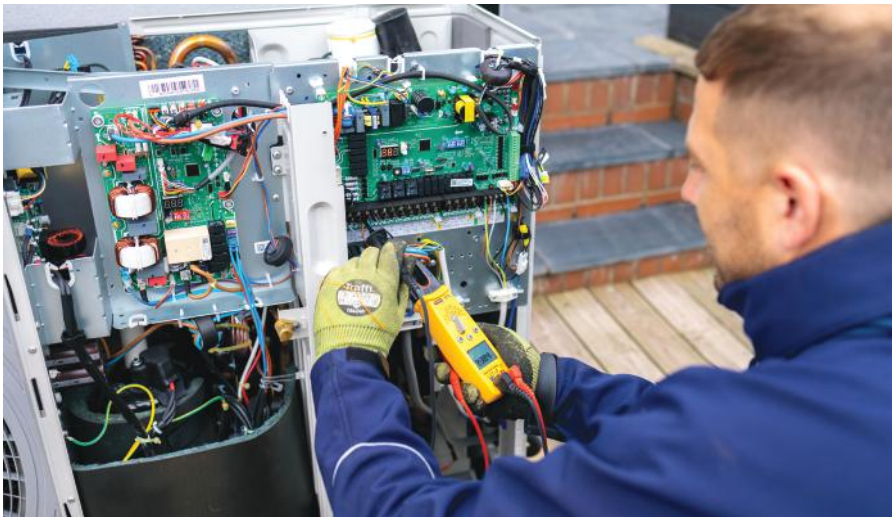
This may be one of the biggest differences for installers moving from boiler work into ASHP installations. The handover has not always carried the same weight, but with heat pumps it protects the installation, the customer relationship and the installer's reputation. A well-informed homeowner is less likely to interfere with settings, less likely to misread normal operation as a fault, and more likely to be satisfied with the finished job.

Customer confidence

ASHP installations are not a leap into the unknown for an experienced heating engineer. The fundamentals of good heating work carry across, but they need to be applied with a sharper focus on planning, sizing, commissioning and handover. Done properly, those details improve day-to-day performance, reduce the risk of avoidable call-backs and help the customer feel confident in the system they have chosen.

For installers and contractors, the opportunity is clear. Heat pumps open up a growing part of the heating market, but success will depend on the quality of the work delivered at property level. The installers who prioritise ASHP system design and customer education, rather than treating the job as a like-for-like swap, will be best placed to build trust and benefit from the market as it develops.

Baxi.co.uk



Reduce Your Admin Drag and Generate Qualified Leads



When you ask solar businesses where they wish they could spend less time, on-site installation is rarely at the top of the list. Instead, the real burden lies in administrative drag: engaging leads, designing systems, closing sales, and keeping pace with evolving compliance standards.

Easy PV, the free design platform built by Cambridge-based renewables distributor Midsummer, has spent this year focusing on new tools to help you streamline your business and free up more time.

Fill your diary with leads

For many installers, winning a job starts with finding it. The new ***Easy PV Solar Marketplace*** connects you directly with qualified local leads to keep your pipeline full. Plus, embeddable lead-generation tools let you effortlessly turn your website traffic and marketing into qualified customer enquiries.

Once a lead arrives, time is critical. Easy PV's new ***automatic whole system design recommendations*** remove tedious step-by-step setup. Simply target a property, and the platform generates a complete, fully specified, and cost proposal in seconds.

Under the hood, nothing is compromised. Installers have control over what kit they prefer to install, and the software models shading, checks inverter and string compatibility, forecasts generation, running costs and financial benefits, and generates an exact bill of materials. You retain full control to easily tweak systems for more complex requirements.

Interactive quotes and finance integration to close sales - fast!

Pro users of the software can now share a compelling, ***interactive online proposal*** with their company branding applied. It is a far more persuasive sales tool than a static PDF. Additionally, ***built-in finance integrations*** with partners like Phoenix Finance put monthly payment options directly inside the quote, making it easier than ever for customers to commit.

The joy of zero-hassle compliance

With the redeveloped MCS installer Scheme rolling out through 2026, staying compliant can feel like a moving target. We're adding a new ***Compliance hub***, available to Pro users, which will help your company, teams and installs keep pace with the latest industry standards. Easy PV makes it easy to generate MCS-compliant performance estimates, structural calculations, schematics, array test reports, MCS handover documents and more.

Powering installers to compete, regardless of size

A powerful, end-to-end design and compliance solution like this used to be the exclusive preserve of the industry's largest installers. Today, Easy PV makes these advanced tools accessible to anyone at a low cost, from small local teams to big companies.

Don't just take our work for it, see it in action on stand C44

Visit us at **Solar & Storage Live** (22–24 September at the NEC, Birmingham). Meet the team behind Easy PV, explore a demo, and claim your ***free trial*** of Easy PV Pro to see how much time you can save.

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Easy PV is free to use at *easy-pv.co.uk* with no credit card required.
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Why data holds the key to better-performing heat pump homes

By **Ian Rose**, Managing Director at Passiv UK.



Ian Rose, Managing Director at Passiv UK

With the Future Homes Standard set to drive the adoption of low-carbon heating and higher energy efficiency in new homes, the UK's housebuilding sector is under increasing pressure to deliver properties that perform as efficiently in practice as they do on paper.

Heat pumps are set to play a growing role in this transition. Installing these systems, however, is only half the challenge. The real test is whether they continue to perform as intended once the home is occupied.

Too often, problems only come to light when a homeowner finds that their home isn't warm enough or their energy bills are higher than expected. By that point, systems may have been running inefficiently for weeks or even months.

Without visibility of what is happening inside the home, developers, housebuilders and installers are effectively working blind. As the industry prepares for the Future Homes Standard, remote monitoring is therefore becoming an increasingly important part of delivering efficient, high-performing homes with heat pumps.

New standards require a new approach to performance

The Future Homes Standard represents a significant shift in how new homes will be designed and built, with greater emphasis on energy efficiency and low-carbon heating. But meeting the requirements at the point of construction is only part of the challenge.

For housebuilders and developers, the longer-term question is whether homes continue to perform as intended once they are occupied.

The performance of a heat pump depends on a range of factors, from system settings and flow temperatures to the thermal characteristics of the property and how the system is operated. Without access to real-world performance data, it can be difficult to identify when a system is underperforming or understand why.

Monitoring provides that missing visibility. It allows housebuilders, developers and installers to move beyond simply installing compliant technology and towards understanding how that technology performs in real homes over time.

From reactive to proactive maintenance

At Passiv, we recently launched the Passiv Portal, a free web-based monitoring platform that enables installers to track and manage all their heat pump installations from one dashboard.

It brings together live and historic performance data - flow temperatures, energy use and system settings - across multiple manufacturers in a single view. That visibility allows installers to understand what is happening in real time.

The shift this enables is important. Instead of waiting for a homeowner to report a problem, installers can spot early warning signs before they become issues.

The result is that homeowners experience fewer disruptions and faster support. Housebuilders and developers can gain greater confidence that heating systems are performing as expected, while installers spend less time travelling to unnecessary call-outs and more time on work that genuinely requires a visit.

For developers, this visibility can also help identify patterns across a development, highlighting where systems may need attention and providing valuable insight into how homes are performing once occupied.

Monitoring is only as good as the control behind it

Of course, monitoring depends on the quality of the data being collected. Controls designed specifically for heat pumps address this by managing flow temperature directly and maintaining more stable system operation.

The Passiv Smart Thermostat is one example. It optimises flow temperature to keep the heat pump operating in its most efficient range. Verified by the Energy Saving Trust, it can improve heat pump efficiency by 17% and reduce heating bills by up to 30%.



It also factors in weather forecasts, the thermal performance of the home, electricity tariffs and rooftop solar generation to optimise operation automatically. Just as importantly, it generates the operational data that makes meaningful monitoring possible in the first place.

Seeing the whole picture

Few housebuilders or developers are dealing with a single installation or one standardised heating system across every property they deliver. Developments can include a mix of heat pump manufacturers, particularly across projects delivered over several years or by different installation partners. Without a unified system, understanding overall performance becomes slow and inconsistent.

A single dashboard that monitors performance provides that missing overview. It allows installers, developers and housebuilders to compare performance across properties, identify recurring issues, prioritise maintenance and track whether systems are delivering expected efficiencies over time.

This creates a feedback loop that can help the industry learn from real-world performance and continuously improve how low-carbon heating is designed, installed and operated in new homes.

Building homes that perform as intended

The Future Homes Standard marks an important step in the UK's transition towards more energy-efficient, low-carbon housing. But the success of the standard will ultimately be judged by how these homes perform in the real world - not simply by whether they meet requirements at the point of completion.

That means the industry has to get two things right at the same time: the technology itself, and how it is experienced by the people living with it.

Heat pumps are still relatively unfamiliar to many homeowners, and that can easily shape perception if something doesn't feel quite right with the heating or running costs.

Having visibility of how systems are operating helps close that gap. It allows installers, housebuilders and developers to demonstrate that systems are working as intended, and to step in early when they are not.

Just as importantly, monitoring can help the industry build a stronger evidence base around the real-world performance of low-carbon homes. As the Future Homes Standard comes into effect, that insight will be essential in ensuring that the homes being built today are compliant, comfortable and fit for the future.

www.passivuk.com



Comfort controls – the next opportunity for heat pump installers

By **Ian Little**, UK Business Development Manager, Resideo.

The UK's transition to low-carbon heating is gathering pace. Driven by continued energy challenges, the replacement of ageing boiler systems and continued government support for low-carbon technologies, heat pumps are becoming seen as an increasingly important heating option.

For installers, this presents a significant opportunity to add value for customers. But while attention understandably focuses on installing heat pumps, an equally important conversation is emerging around how these systems are controlled. We've explored this topic in detail in our recent white paper Practical Approaches to Controlling Heat Pumps and pulled out some key elements in this article.

Homeowners are likely to judge their investment in a heat pump not simply on efficiency figures, but on comfort, ease of use and everyday performance. That makes heating controls an important consideration in heat pump system design.

The white paper notes that the UK market is still finding its footing, although uptake is gathering pace, with over 51,000 retrofit heat pump installations recorded by DESNZ in 2025 and over 60,000 MCS-certified heat pump installations recorded in the same year.

Across Europe, markets such as Germany and the Netherlands continue to demonstrate the growing appetite for renewable heating, with Germany installing around 345,000 heat pumps during 2025 and the Netherlands adding approximately 143,000 systems in the same year[1].

As the UK market continues to mature, installers are expanding their skills to meet growing demand. City Plumbing research cited in the white paper found that, out of 500 UK installers surveyed, 58% were already trained and a further 34% planned to upskill in the following 12 months. This points to growing professional engagement with heat pump technology.

However, installing the heat pump itself is only part of the equation.

To deliver systems that consistently meet customer expectations, installers also need a strong understanding of heating controls and the role they play in achieving comfort, efficiency, and long-term system performance.

Control strategy should no longer be viewed as an optional extra or a final commissioning task; it should be considered from the earliest stages of system design.

Homeowners increasingly expect heating systems that are intuitive to operate, responsive to changing lifestyles and capable of delivering consistent comfort while supporting efficient operation. Those expectations place heating controls firmly at the centre of the customer experience.

Heat pump and comfort control

For installers, this creates an opportunity to add value and help to differentiate their services. There is no single control strategy that suits every property, with the most appropriate approach depending on factors such as property type, hydraulic design and homeowner expectations.

An effective heat pump installation begins with understanding the distinct roles played by the heat pump controller and the comfort controls.

The heat pump manufacturer's controller should remain responsible for managing how heat is generated. Functions such as flow temperature management, weather compensation and compressor modulation are fundamental to maintaining efficient, stable operation. These sophisticated controls are specifically designed to optimise the performance of the heat pump itself.

Comfort controls perform a different but important role.

Rather than determining how heat is produced, they manage how heat is used throughout the home. This includes scheduling, temperature adjustment and, increasingly, room-by-room zoning.

Keeping these responsibilities clearly separated can support a more predictable and easier-to-manage system. The heat pump controller focuses on heat generation, while dedicated comfort controls can allow homeowners to tailor heating around daily routines and preferences.



Ian Little, UK Business Development Manager, Resideo



Where the system is correctly sized, designed and configured, this approach can support predictable commissioning and maintenance, while helping to deliver consistent comfort over the lifetime of the installation.

Demand-led comfort control can also help to support efficient energy use. Instead of heating an entire property to the same temperature throughout the day, zoning can allow heat to be directed where and when it is needed. However, as the white paper makes clear, any zoning strategy must preserve minimum flow, follow manufacturer requirements and be supported by appropriate hydraulic design.

Comfort control options

Installers now have access to a range of comfort control solutions that can complement modern heat pump installations, depending on the connected system, configuration and manufacturer requirements.

Resideo's portfolio of heating controls is designed to support this separation between heat generation and comfort management, where compatible with the heat pump, interface type and system design. Whether a homeowner requires straightforward time and temperature scheduling or more advanced multi-zone control, installers can select solutions that suit both the property and the customer's expectations.

For some installations, a simple programmable thermostat such as the T3 or T3R may provide suitable time and temperature control, subject to compatibility with the connected system and manufacturer requirements. Larger or more complex properties may benefit from advanced zoned solutions such as evohome, where room-by-room control is required and the hydraulic design supports minimum flow.

Where underfloor heating form's part or all of the heating system, the HCC100 multi-zone controller can provide a purpose-designed solution for managing multiple wired and wireless thermostats, where the system is designed and configured to maintain appropriate operating conditions.

Understanding where each of these solutions fits within different system designs can help installers provide informed recommendations rather than simply supplying a thermostat. As heat pump installations become more common, this product knowledge may become an increasingly valuable differentiator.

Train to gain

Developing this expertise requires ongoing learning. While many installers are investing in heat pump qualifications, expanding knowledge of heating controls should form part of the same professional development journey.

A thorough understanding of control strategy enables installers to have more informed conversations with customers, specify systems more accurately and deliver installations that achieve both technical performance and customer satisfaction.

Resideo Academy has been developed to support installers in building these skills. Through a combination of instructor-led courses, online learning modules and the Resideo Academy app, installers can access flexible training designed to fit around busy working schedules.

This can help professionals build confidence from specification through commissioning and customer handover.

As heat pump adoption continues to accelerate, installers who understand the complete heating system, not just the heat pump itself, will be better placed to support customers. Specialist comfort controls are not a replacement for the manufacturer's controller; they perform a complementary function focused on comfort, scheduling and zoning.

Homeowners will evaluate their new heating system in the same way they have always judged central heating: Does it keep the home comfortable? Is it easy to use? Does it perform reliably day after day?

For installers, answering "yes" to those questions depends on the control strategy as well as the heat pump itself. By considering comfort controls from the earliest stages of system design, installers can support more predictable installations, more confident customers and fewer avoidable callbacks.





Download full report: **www.resideo.com/gb/en/solutions/home-comfort/heat-pump-white-paper**

Source
1. https://ehpa.org/news-and-resources/press-releases/heat-pump-sales-testify-to-government-action/



Low carbon homes need more than ambition, they need infrastructure that works

Adam Tkacz, Business Development Director – Sustainable Heat at GTC, discusses that low-carbon homes need shared energy infrastructure, not just heat pumps. Planning integrated heating networks from the outset can cut carbon, reduce grid demand and create more resilient, future-ready developments.

The Future Homes Standard has changed the conversation around residential development. The debate is no longer whether new homes should be low carbon, but how the industry delivers them at scale without compromising affordability, build quality or customer experience.

For too long, conversations around decarbonising housing have centred on the technologies installed inside individual homes. Heat pumps have become the headline, yet they are only one part of a much bigger picture. The real challenge is creating the energy infrastructure that allows thousands of low-carbon homes to operate efficiently and reliably for decades to come.

As housebuilding continues and pressure on the electricity network grows, infrastructure is becoming one of the biggest strategic decisions a developer can make. The projects that succeed won't simply specify low-carbon heating technologies, they'll design communities around integrated energy networks that reduce carbon, minimise grid impact and remain adaptable as technology evolves.

Infrastructure is the missing piece

Heating accounts for a significant proportion of a home's carbon emissions, making it one of the most important elements of the Future Homes Standard. But replacing gas with electric heating alone isn't enough.

Developers must also consider electrical capacity, land availability, planning constraints, whole-life operating costs, maintenance responsibilities and the long-term experience of homeowners. Designing each home as an isolated system can increase complexity, place greater demand on local electricity networks and create challenges as developments increase in size.

Instead, we're seeing growing recognition that shared infrastructure offers a more resilient and scalable approach. Just as developers routinely think collectively about roads, drainage and utilities, low-carbon heat should be viewed as community infrastructure rather than a collection of individual systems.

Smarter use of the ground beneath our feet

One of the clearest examples is the growth of Smart Networked Ground Source Heat Pumps (GSHP). Rather than every property requiring its own ground array, a networked approach creates a shared ambient loop network beneath the development. Individual homes retain their own heat pump, giving residents complete control over heating and hot water, while benefiting from a communal underground network.



Adam Tkacz, Business Development Director – Sustainable Heat at GTC

Because ground temperatures remain relatively stable throughout the year, these systems consistently operate at high efficiencies, producing around four units of heat for every unit of electricity consumed. The result is a heating solution capable of delivering 75% lower carbon emissions than traditional gas heating.

Importantly, the benefits extend beyond carbon reduction. By sharing infrastructure across an entire development, Smart Networked GSHPs can reduce peak electrical demand by up to 50% compared with individual air source heat pumps, easing pressure on local electricity networks and reducing the need for costly reinforcement works. They also eliminate the need for external units at every property, improving streetscapes while giving developers greater flexibility over site layouts.



Chilton Woods CHH external



Borehole drilling for Networked Ground Source Heat Pump

As developments become larger and more complex, these networked systems demonstrate how low-carbon heating can be delivered without treating every home as a standalone challenge.

Heat networks have entered a new generation

Heat networks have traditionally been associated with high-density, high-rise developments, but the technology has evolved significantly.

Modern low-temperature heat networks are now supporting low-rise, low-density residential developments, combining the efficiency of shared infrastructure with the performance expected by today's homeowners.

Community Heat Hubs exemplify this next generation of heat networks. Instead of installing an individual external heat pump at every property, central air source heat pumps generate low-carbon heat before distributing it through a shared low-temperature network serving the whole development.

The approach offers significant operational advantages. By centralising plant, maintenance and future technology upgrades become simpler while homeowners benefit from a quieter environment without external heating equipment.

The model also delivers measurable infrastructure benefits. Community Heat Hubs can reduce peak site-wide electricity demand by up to 15% through integrated thermal storage, helping developers manage electrical capacity while improving network resilience. They are capable of delivering up to 80% carbon savings compared with traditional gas heating and produce three to four units of heat for every unit of electricity consumed, making them one of the most efficient low-carbon heating solutions currently available for residential developments.

Planning for communities, not just homes

The most successful low-carbon developments are those where infrastructure conversations begin at the earliest stages of design.

Heating strategies can no longer be considered in isolation or left until detailed design. Decisions around energy infrastructure influence site layout, utility coordination, planning outcomes, and long-term operational performance.

Bringing developers, planners, architects, utility providers and energy specialists together from the outset creates opportunities to optimise land use, coordinate utility installation and design communities that are genuinely future-ready rather than simply compliant on completion.

This integrated approach also enables multiple utility networks to be delivered through a coordinated programme, reducing construction complexity while improving long-term asset management.

Future-proofing housing for the decades ahead

The Future Homes Standard should not be viewed as the finish line. It is the beginning of a new generation of residential infrastructure.

The homes being built today will still be occupied well beyond 2075. During that time, electricity generation will continue to decarbonise, energy technologies will develop, and customer expectations will evolve. The infrastructure we install now must be capable of adapting alongside them.

That means looking beyond individual products and embracing systems designed for resilience, flexibility and whole-life performance.

No single heating technology will suit every development, but the direction of travel is becoming increasingly clear. Shared infrastructure, whether through Smart Networked GSHPs or modern Community Heat Hubs, offers developers practical, scalable solutions that reduce carbon emissions, ease pressure on the electricity network and create communities built for the long term.

www.gtc-uk.co.uk

Minimize vibrations. Reduce noise. Design quiet heat pumps.

By **Marc Dietrich**, Product Manager, Getzner Werkstoffe GmbH.

Heat pumps are a key component of the energy transition. As their use increases, so do expectations regarding acoustic performance. Modern inverter-driven heat pumps present challenges: during part-load operation, low-frequency noise and vibrations can become especially noticeable. Effective vibration isolation is therefore essential for reducing noise and improving overall comfort.

Why vibration isolation matters

The transmission of vibrations significantly influences the noise level of a heat pump. Vibrations generated by the compressor can excite pipework, components, and housing parts, creating unwanted noise. Effective vibration isolation reduces the transfer of vibration energy into the system. The greatest benefit is achieved when isolation is applied as close as possible to the vibration source, directly at the compressor (fig. 1).



Fig. 1

Compressor bearing in a heat pump
© Ovum Waermepumpen

Static and dynamic stiffness: A critical distinction

When selecting a bearing element, static stiffness is often used as a reference. It describes how much a bearing deforms under load and is important for load-bearing capacity. For vibration isolation, however, dynamic stiffness is the decisive parameter. Together with the supported mass, it determines the system's natural frequency and therefore its isolation performance. Because elastomer materials behave differently under dynamic and static loads, two bearings with similar static load capacities can deliver very different acoustic results.

The role of natural frequency

Every elastically mounted system has a natural frequency (f_o), determined by the bearing's dynamic stiffness and the supported mass. The relationship between excitation frequency (f_e) and natural frequency is crucial (fig. 2):

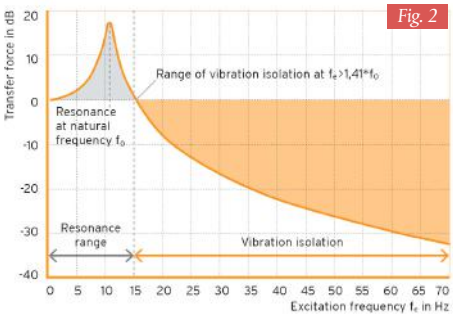


Fig. 2

- At $f_e/f_o = 1$, resonance occurs and vibrations are amplified.
- Effective vibration isolation begins only when the ratio exceeds √2.

As a result, even small differences in natural frequency can strongly influence acoustic performance.

Why do a few hertz make a difference

Consider a rubber bearing with a static stiffness of 306 N/mm and a PU bearing with 331 N/mm. Although the PU bearing is about 8% statically stiffer, its lower dynamic stiffness results in a lower natural frequency of 15 Hz compared with 19 Hz for the rubber bearing.

At a compressor frequency of 25 Hz, the ratios are:

- Rubber bearing: $\eta = 25/19 = 1.32$
- PU bearing: $\eta = 25/15 = 1.66$

The rubber bearing still operates close to the resonance range, whereas the PU bearing is already within the isolation range. Consequently, vibration transmission is reduced and noise levels are lower.

Benefits for heat pump applications

For many rubber mounts, manufacturers specify only static stiffness. Information about dynamic stiffness and resulting natural frequencies is often unavailable, despite their importance for vibration isolation. Standard rubber mounts typically achieve natural frequencies above 20 Hz. For modern inverter heat pumps operating at low compressor speeds, this can be problematic. In many cases, natural frequencies below 15 Hz are required to maintain sufficient distance from the resonance range and ensure effective vibration isolation.

Getzner PU bearings are specifically developed for vibration isolation and are comprehensively characterized in terms of both static and dynamic properties. Their low natural frequencies support improved acoustic performance and have proven effective in numerous heat pump applications.

Conclusion

To achieve effective noise reduction, vibration isolation should be integrated into heat pump development from the earliest design stages through to series production. Selecting bearing elements with low dynamic stiffness and low natural frequencies increases the distance from resonance, reduces vibration transmission, and significantly improves the acoustics of modern heat pumps.

www.getzner.com



Collaboration delivers £2m saving for university decarbonisation project

Birmingham City University has replaced the gas heating in its School of Health Sciences with heat pumps, as part of a wider £3.3 million decarbonisation programme across the university's estate.

Delivered by principal contractor SHEco Renewable Systems in collaboration with wholesaler, Kooltech and heat pump manufacturer, Mitsubishi Electric, a two-month value-engineering process identified £2 million of savings for the university, while fully meeting the building's requirements. The wider programme is supported by funding from the Public Sector Decarbonisation Scheme, managed by Salix.

The funding has enabled the University to replace ageing gas boilers and chillers at its City South Campus with a heat pump-led heating and cooling system. This provides more than 1MW of heating and 1MW of cooling, with 50kW solar array and extensive LED lighting upgrades to further reduce electricity consumption.

Sustainability strategy

The measures support the university's long-term sustainability strategy and carbon reduction commitments, marking one of the university's first large-scale, heat pump-led decarbonisation projects and setting a clear benchmark for building transformation in the higher education sector.

"The University has a strategic goal of working towards zero carbon," explained David Phillips, Senior Mechanical Engineer at Birmingham City University. "SHEco, Kooltech and Mitsubishi Electric had to work quickly to develop a solution that met the building's requirements, while remaining within budget."

Solution

The solution uses two Climaveneta NX2-Q air source heat pumps which provide simultaneous heating and cooling to the building. These also feed four EW-HT water-to-water heat pumps which boost the water temperatures to 70°C, avoiding the need to change any of the secondary-side heat emitters, which helped reduce the overall budget.

"Working closely with Kooltech and Mitsubishi Electric enabled us to protect the University's core performance requirements while identifying significant opportunities to reduce costs, without compromising technical quality or performance," added Adam Clark, Commercial Director at SHEco Group.

Specialist product support from Mitsubishi Electric also ensured the flow temperatures matched the cooling and heating loads for the building, while meeting the requirements for the Public Sector Decarbonisation Scheme and existing City South Campus buildings infrastructure.

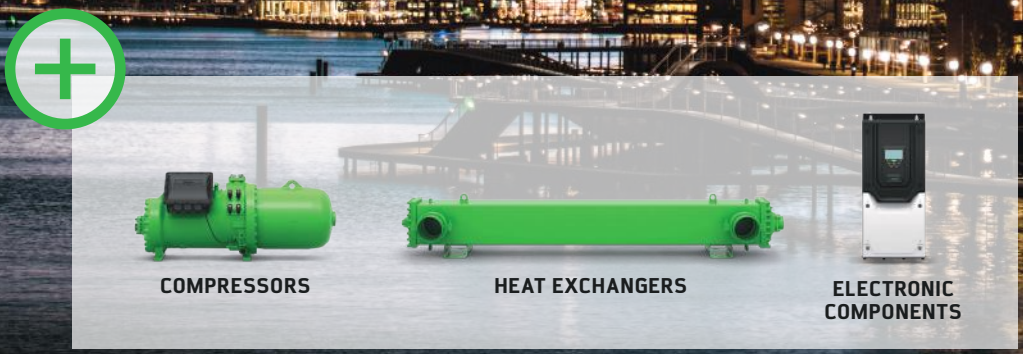
"We're really pleased with the result," ended David Phillips. "The best thing I can say is that we hardly had to speak to them during the project as they've just carried on and provided us with solutions to any minor deviations that they came across."

The project highlights how collaboration has helped turn ambitious decarbonisation plans into a practical solution for the university while adhering to tight budgets and timelines.



To watch the video visit;
www.youtube.com watch?v=TReWqUZ4yBs

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Bitzer

DAS HERZ DER FRISCHE

Skills First:
Why the heat pump transition depends on people, not just products

BITZER UK argues that training, support and collaboration will be just as important as technology in delivering the UK's low-carbon heating ambitions.

As the UK accelerates its transition towards low-carbon heating, attention is often focused on system efficiency, refrigerant choices and next-generation heat pump technologies. But according to James Graham, Managing Direct of BITZER UK, the success of this transition will depend just as much on the people installing, commissioning and maintaining these systems as it will on the equipment itself.

"One of my immediate priorities since stepping into the role has been listening - to customers, contractors and our own team," says BITZER UK. "A consistent message has emerged: as systems evolve, investment in skills is just as important as investment in technology."

The shift towards lower-GWP refrigerants, the increasing adoption of natural refrigerants such as R290 and R1270, and the growing complexity of commercial and industrial heat pump systems are all placing new demands on engineers. At the same time, the sector continues to face a well-documented skills gap that risks slowing deployment if not addressed collaboratively.

"The cooling sector is facing a critical skills gap, and we cannot solve it in isolation," James notes. "We are proud to support initiatives such as the Institute of Refrigeration Industry Skills Alliance because they help bridge the divide between education and industrial reality. By uniting partners and strengthening training standards, we're not just filling roles - we're securing the long-term resilience of the industry."



Training as a foundation for adoption

For BITZER, training is not an adjunct to product development, but a core part of enabling the wider adoption of low-carbon technologies.

The company is investing in structured training programmes at its UK headquarters in Milton Keynes, alongside field-based technical support and refrigerant handling courses.

"As systems become more complex, engineers need more than product familiarity - they need confidence working across different refrigerants, applications and control strategies," James explains. "That is particularly true in the industrial and commercial heat pump sector, where system scale and operating conditions demand a broader level of technical understanding."

Preparing for a natural refrigerant future

The transition towards lower-GWP and natural refrigerants is reshaping system design across the industry.

To support this transition, the company has developed compressor solutions designed for use with hydrocarbon refrigerants such as R290 and R1270, which are particularly well suited to heat pump applications in commercial and industrial settings.

At the same time, BITZER UK expects increasing adoption of CO_2 systems and ammonia-based industrial applications, particularly in larger-scale installations where efficiency and performance are critical.

However, the company is clear that technology alone will not drive adoption.

"Natural refrigerants and next-generation systems are already available, but their success depends on engineers being confident in how to apply them safely and effectively," James says. "That is where training and knowledge transfer become essential."



James Graham, Managing Director, Bitzer UK

Digitalisation and doing more with less

Alongside skills development, BITZER also sees digitalisation as a key enabler for the sector, particularly as labour shortages continue to impact the industry.

Digital monitoring and predictive maintenance tools are increasingly being used to support engineers in diagnosing faults, optimising system performance and reducing downtime.

"Digitalisation is a natural progression, as it allows faults to be identified and rectified remotely. Engineers will be able to do more with fewer resources, which is increasingly important given the current skills shortage. Hence, it is not about replacing expertise - it is about enhancing it."

A shared responsibility for the future

With heat pump deployment expected to rise significantly in the commercial and industrial sectors over the next decade, BITZER UK believes the responsibility for supporting the workforce must be shared across manufacturers, contractors, wholesalers and industry bodies.

This means continuing to invest in training infrastructure, supporting industry-wide initiatives, and ensuring engineers have access to the knowledge and tools they need to work confidently with evolving technologies.

www.bitzer.de/gb/en/

Why social housing needs a different approach to home energy storage

In this article, **Angus Flett**, CEO, Kight Powerhubs, discusses why home energy storage is becoming central to the flexible, low-carbon home. He explains why deploying batteries across social housing requires a different approach from the traditional homeowner market, with safety, insurance, whole-life cost and full-lifecycle support considered from the outset.



Angus Flett, CEO, Kight Powerhubs

Home storage is entering a new phase

For much of the domestic market, the original case for battery storage was straightforward - capture surplus rooftop solar during the day and use it later, rather than exporting it to the grid at a relatively low rate. That remains an important benefit, but it is no longer the whole story.

As time-of-use tariffs develop and the electricity system becomes more flexible, a home battery can buy and store electricity when it is cheaper, reduce demand during expensive peak periods, support heat pumps and wider home electrification, and provide a degree of resilience during grid interruptions. Over time, aggregated domestic systems may also contribute to flexibility services that help balance local and national networks.

The home battery is therefore moving beyond its role as an accessory to solar. It is becoming part of the home's energy infrastructure.

Why social housing is different

The purchasing decision for a social landlord is fundamentally different from the decision made by an individual homeowner.

A homeowner may concentrate on purchase price, payback, solar self-consumption, app features and backup power. A social landlord must consider how a system will perform across hundreds or thousands of homes, different property archetypes and changing tenancies.

The questions are wider. Is the product safe, robust and insurable? How long will it remain in service? Can it be installed consistently in both retrofit and new-build properties? Who identifies the right homes and tenants? Who monitors performance and responds to faults?

What happens during a void period or tenancy change? How will tenants be supported to secure the best available tariff? How will data privacy and cyber security be managed? Who takes responsibility when the system reaches the end of warranty or service life?

These are not reasons to avoid storage. They are the design requirements for deploying it responsibly at scale.

Safety and insurance must be designed in

Battery safety cannot be treated as a technical footnote. Systems may be installed inside homes, in utility spaces, externally, or in properties occupied by older, disabled or otherwise vulnerable tenants.

PAS 63100:2024 has sharpened attention on fire safety for small-scale electrical battery energy storage systems installed in dwellings. For landlords, installers and insurers, this means understanding the complete safety case rather than relying on a single product claim.

That case should include the battery chemistry, thermal behaviour, enclosure design, installation location, fault detection, monitoring, emergency procedures, product certification and installer competence. It should also make clear who is responsible for ongoing monitoring, maintenance and incident response.

The most effective approach is to address insurer acceptance and installation requirements at the specification stage, rather than discovering additional conditions after procurement. Manufacturers, landlords, installers and insurers should work from the same documented evidence and the same understanding of risk.



Whole-life value matters more than the headline price

Social landlords are accustomed to assessing assets over decades. Home storage should be considered in the same way.

A lower initial purchase price does not necessarily represent better value if the system degrades quickly, requires early replacement, creates additional insurance conditions, relies on unstable communications or generates repeated installer call-backs. Warranty limitations, software fees, maintenance requirements, tenant support and eventual disposal can all affect the real cost.



A more useful comparison considers usable cycles, expected service life, warranty coverage, degradation, maintenance, monitoring, communications, aftercare, replacement and recycling. It should also consider the disruption and administrative burden created when a system has to be replaced across a portfolio.

Potential future flexibility revenues may strengthen the business case, but they should not be treated as guaranteed income. The immediate case must still stand on tenant benefit, operational performance and risk-adjusted whole-life value.

For social housing, the right question is not simply "What does the battery cost?" It is "What value will this energy asset deliver over its working life?"

A managed service across the whole life of the system

The distinction between a successful social-housing energy programme and a simple equipment installation is the service wrapped around it.

That service should begin before the battery reaches the property. Housing providers need support identifying the homes and tenants most likely to benefit, assessing property suitability and understanding how the system will fit alongside existing or planned retrofit measures.

During installation, the focus should not be limited to commissioning the hardware. The landlord and tenant also need to be onboarded properly, with clear information on tariffs, operation, support and how the system can deliver the greatest possible saving.

After installation, the service must continue. Remote monitoring should identify faults, connectivity problems and unusual consumption, while helping ensure the system continues to charge and discharge at the most appropriate times. Tenants may also need support moving to a better tariff, particularly when circumstances change or a new tenant moves into the property.

The responsibility should continue through the full life of the asset, including software and system upgrades, warranty transitions, replacement and eventual removal.

Our work at Kight Powerhubs with social housing partners has reinforced a simple lesson: once the installation van has left, the monitoring, software and team behind the system are what keep it performing. That is the difference between installing a battery and delivering a managed home-energy service.

Tenants need clarity, not complexity

Nobody wants a lecture on wholesale markets or settlement reform. Tenants want lower bills, warmth, reliability and a clear number to call when something goes wrong.

That means early engagement must be part of the installation, not an afterthought. Tenants need to understand what is being fitted, what disruption to expect, what the system does for them and who to contact for help.

This matters more, not less, where tenants are older, disabled, vulnerable or less confident with digital technology. Clear handover information and continuing support are essential if the system is to deliver its intended benefit.

Support must also continue when a new tenant moves into the property. A well-engineered system that tenants do not trust, understand or know how to use will not deliver its full value.

What this means for you on site

If you are installing or specifying for social housing, there are several points that should be clear before a product is selected:

- Documentation that can be repeated consistently across sites, not a one-off specification sheet
- Pre-survey requirements that are standardised rather than reinvented for every property
- Clear ownership of G99 applications, MCS paperwork, commissioning and handover
- Defined responsibility for tenant onboarding and tariff support
- An agreed service route for diagnostics and break-fix, decided before a fault occurs
- Design-stage compatibility with solar, heat pumps and smart meters
- A managed support commitment in writing, including who monitors the system and how faults are handled over its working life
- A clear plan for upgrades, warranty transitions, replacement and eventual removal

The strongest programmes bring manufacturers, installers, landlords, insurers and energy-service partners together at the design stage, with installers treated as more than the last link in the chain.

Installers know what fails in the field. That knowledge should help shape the product and the delivery model, not simply be called on to fix problems afterwards. When diagnostics and support are managed centrally, the installer is not left carrying a fault that cannot be resolved from the roadside.

The bottom line

Home battery storage can help reduce tenant energy costs, increase the value of rooftop solar and give landlords clearer visibility across their housing stock.

But the value does not come from the hardware alone. It comes from selecting the right homes, onboarding tenants properly, monitoring performance continuously, maintaining tariff optimisation, supporting future tenants and managing the asset through upgrades, replacement and eventual removal.

Social housing does not need another product that becomes someone else's responsibility once it has been commissioned. It needs a long-term service model that supports the landlord, the installer and the tenant throughout the system's working life.

Safety, insurance and product performance remain essential. But for large-scale social-housing deployment, service is every bit as important as the battery itself.

https://kightpowerhubs.com/



Intelligent energy: unleashing the power of the Golden Triangle

By **Cameron Beech**, Head of Product Management & Training, Viessmann Climate Solutions UK.

For many homeowners, the journey to a low-carbon home begins with a single investment. It might be a heat pump, solar PV panels, charger for an electric vehicle (EV) or, increasingly, battery storage. Traditionally, these technologies have been purchased independently of each other, often with little consideration for how future additions will work together. However, that approach is beginning to change.

As electricity prices fluctuate, dynamic tariffs are becoming more widespread and households are looking for greater optimisation and control over their energy use, the focus is shifting from a piecemeal approach to creating smart energy ecosystems. Rather than simply generating or consuming electricity, homes are becoming capable of managing energy automatically, using the right technology at the right time to maximise efficiency, minimise running costs and reduce carbon emissions.

At the heart of this transformation is what could be described as the 'golden triangle' of home energy: heat pumps, solar PV and battery storage. Each technology delivers benefits in its own right, but when intelligently connected, their combined value is significantly greater than the sum of their individual parts.

Challenges

Until now, however, connecting them has not been that easy. Different manufacturers, incompatible controls and multiple smartphone apps have often resulted in appliances that operate independently rather than collaboratively.

Related to this is the issue of affordability. Few households are in a position to invest simultaneously in a heat pump, solar PV, mechanical ventilation and heat recovery (MVHR), battery storage and an electric vehicle charger. More commonly, these technologies are installed over several years as budgets allow.



Cameron Beech, Head of Product Management & Training, Viessmann Climate Solutions UK

This makes future-proofing those early investments challenging. A homeowner purchasing any one item today needs confidence that it will integrate seamlessly with others installed several years later, without the need to replace existing controls.

This is precisely the thinking behind the new monobloc air-to-water heat pump from Viessmann, and the One Base Intelligence platform that underpins it.

Intelligent answer

Launched as the first of a new generation of intelligent energy products, the Vitocal 200-A ie has been designed not simply as a heating appliance, but as the foundation of a complete home energy ecosystem. Whichever element a householder starts with, every component can become part of a single smart, autonomous system, growing alongside the household's requirements without concerns over compatibility or duplicated controls. This allows customers to build their energy infrastructure progressively, making the transition to low-carbon living far more achievable.

The real innovation lies in the software. Viessmann's One Base Intelligence isa self-learning platform that provides a unified operating logic for connected energy technologies.

Rather than managing multiple devices independently, One Base Intelligence continuously monitors and optimises energy flows across the entire home. All heating and energy devices can communicate through the same intelligent system, presented to the homeowner as one central control unit via the ViCare app.

This holistic approach removes much of the complexity traditionally associated with home energy management. Instead of the occupants manually deciding when to charge a battery or vehicle, heat the hot water cylinder or deploy self-generated electricity, the system continuously learns household behaviour and automatically adjusts operation to maximise efficiency and take advantage of cheaper energy prices.

For homeowners, the result is lower running costs and improved convenience. For installers, it removes many of the compatibility concerns that have historically complicated multi-technology installations.

Open by design

Another important feature of the new platform is its openness. Renewable technology is evolving rapidly, and few homeowners want to be locked into a single manufacturer. We have therefore designed One Base Intelligence to integrate not only with its own products but also with selected third-party technologies and controls.

Equally, the new Universal Controller can even be installed as a standalone controller, bringing any compatible heat pump, solar PV or air conditioning system into the ViCare platform. For installers, this creates opportunities not only in new installations but also in upgrading existing renewable systems with improved energy management.

Dynamic tariffs

As electricity suppliers introduce increasingly sophisticated time-of-use tariffs, the ability to use power when it's cheapest is becoming almost as important as reducing the amount consumed.

The Universal Controller has been developed with this in mind. It allows the system to automatically optimise operation according to electricity pricing. Instead of homeowners having to monitor tariff changes or programme multiple devices individually, the system can intelligently coordinate the heat pump, battery storage and solar generation to maximise self-consumption and minimise imported electricity during expensive periods.

This intelligent optimisation is enhanced by over-the-air software updates, allowing new functions and improvements to be introduced throughout the system's lifetime. Rather than becoming outdated, the platform continues to evolve alongside changing tariffs, technologies and energy markets.

Made for the UK market

While its digital capability attracts much of the attention, the new heat pump has also been developed to simplify installation. Designed specifically with input from UK renewable heating specialists, it reflects practical feedback gathered over several years, covering everything from pipework layouts and electrical connections to packaging and the way British homeowners use their airing cupboards.

The outdoor unit has also been designed with installers in mind. Models up to 12 kW use a single-fan configuration, with outputs from 4 to 12 kW covering around 70-80% of UK homes. Weighing from around 90 kg, the units remain relatively straightforward to transport and install, with every model fitting on a standard Euro pallet.

For larger properties, up to four heat pumps can be cascaded together to deliver maximum outputs of 48 kW using only one indoor unit and a single wall penetration. This reduces installation time while simplifying system design.

Golden Triangle

The golden triangle of heat pumps, solar PV and battery storage already offers compelling environmental and financial benefits. Intelligent software now unlocks even greater value by ensuring each technology works in harmony rather than isolation. For installers, this creates opportunities to build long-term customer relationships as systems evolve over time. For homeowners, it offers reassurance that investments made today will remain compatible with tomorrow's technologies.

The new Vitocal 200-A ie represents more than the launch of another heat pump. It signals a move towards expandable, intelligent home energy systems where products can be added as budgets allow, software improves continuously, and renewable technologies operate as one coordinated whole. As the transition to low-carbon homes accelerates, that flexibility may prove just as valuable as the efficiency of the heat pump itself.

www.viessmann.co.uk



The Golden Triangle:

Why the next challenge isn't installing technology – it's making it work together

By **Iván Castro**, Managing Director at Levelise.

The UK's transition to a low-carbon energy system has reached a significant turning point. Solar, heat pumps and battery storage are often described as the 'golden triangle' of home decarbonisation, with EV charging representing the fourth component that can help create a fully electric home.

For years, the focus has rightly been on encouraging homeowners to adopt these technologies. But as deployment accelerates, a new challenge is emerging. It is no longer simply about installing low-carbon technologies, but ensuring they operate together in the most effective way.

Each technology saves money alone, but together they compound: storage and smart control let solar generation serve heat and transport demand instead of spilling to the grid.

The value of this combination depends on something beyond the hardware itself - intelligent coordination.

Moving beyond standalone technologies

A home with solar PV, a heat pump and battery storage has all the ingredients needed to become a more efficient and flexible energy system. But simply adding more technology does not automatically deliver the maximum benefit.

Solar panels typically generate the most electricity during the middle of the day, when household demand is often lower. Meanwhile, heating demand tends to increase in the morning and evening, and EV charging frequently takes place after people return home from work. Without a way to connect these different patterns of generation and consumption, much of the potential value is lost.

A battery begins to bridge that gap by storing excess solar generation and making it available when demand increases. But its role is becoming far more significant than simply storing electricity.

It can absorb electricity when supply is plentiful and release it when energy is more valuable. This could mean storing excess solar generation during the day, reducing reliance on grid electricity in the evening, or responding to changes in electricity prices and network demand.

As more homes adopt heat pumps and electric vehicles, this ability becomes increasingly important.

From electricity consumers to flexible energy systems

Traditional homes have operated as passive energy consumers. Electricity is imported from the grid whenever it is needed, with limited ability to influence when demand occurs.



Iván Castro, Managing Director at Levelise

Electrification changes this relationship. A heat pump does not always need to operate at the exact moment it is switched on. An electric vehicle rarely needs to begin charging immediately when it is connected. A battery can decide whether to charge, discharge or remain idle depending on wider system conditions.

These assets create flexibility. However, flexibility only has value when it can be managed intelligently. Without coordination, electrification could unintentionally increase pressure on the electricity system. Heat pumps, EV chargers and other electrical loads could all operate at the same time, creating higher peaks in demand.

With intelligent control, those same technologies become valuable flexible assets. Charging can be shifted to periods when renewable generation is abundant.





Heating can be optimised around household requirements and energy prices. Batteries can respond dynamically to both household needs and wider grid conditions.

The result is a system that works more efficiently for the homeowner while supporting the transition to a more flexible electricity network.

The missing layer: orchestration

The challenge is that these outcomes cannot be achieved through hardware alone. Behind every intelligent energy system is a sophisticated digital layer that connects devices, analyses data and makes decisions in real time.

This orchestration layer is responsible for understanding multiple variables simultaneously: household consumption patterns, weather forecasts, solar generation, electricity prices, grid requirements and the operational needs of individual assets.

It must balance competing priorities. For example, a battery could maximise solar self-consumption, reduce electricity costs through tariff optimisation or provide flexibility services to the grid. The right decision depends on conditions at that moment.

This requires more than simple automation. It requires continuous forecasting, optimisation and control.

The intelligence is not contained within any single asset. It sits in the software connecting them.

Unlocking value beyond self-consumption

Much of the early conversation around domestic batteries has focused on increasing self-consumption and reducing electricity bills. These remain important benefits, but they represent only part of the opportunity.

When aggregated and intelligently controlled, domestic energy assets can provide valuable flexibility services to the electricity system.

The UK's energy network is undergoing a fundamental transformation as renewable generation increases. Unlike traditional power stations, renewable sources such as wind and solar are variable, meaning the system requires new ways to balance supply and demand.

Flexible technologies within homes can play a role in this. A connected battery can respond to grid requirements in real time, charging when there is excess electricity available and discharging when demand increases. This creates an additional revenue opportunity while helping maintain a stable electricity system. However, accessing these markets requires significant infrastructure.

Why flexibility needs infrastructure

A household battery cannot participate in energy markets independently. Market access itself is infrastructure: registration, qualification, credit and compliance are beyond any household, so the platform carries that burden while software protects comfort and battery health.

For individual homeowners, this complexity is impossible to manage. Even for installers and manufacturers, connecting thousands of different assets into a functioning flexibility ecosystem presents significant challenges. Flexibility needs infrastructure: a data and control layer that glues the asset to the market, handling telemetry, forecasting, optimisation, dispatch and settlement-grade metering.

An effective platform, such as Levelise Hub, sits alongside a home battery to solve this by acting as the link between domestic energy assets and wider energy markets. It manages the complexity behind the scenes, while ensuring homeowners continue to receive the benefits of their technology without compromising comfort or battery health.

It also helps overcome another challenge facing the sector: hardware fragmentation. The domestic energy market includes a growing number of battery manufacturers, inverter technologies and communication standards. For flexibility markets to operate at scale, these differences need to be managed.

A sophisticated software layer can effectively translate between different technologies, allowing diverse assets to operate together as a single, flexible resource.

Whether a home has one battery brand or another, the wider energy system can interact with them in a consistent way.

The next stage of the energy transition

The domestic renewables sector has achieved a huge amount by making low-carbon technologies available to homeowners. The next stage will be about making those technologies smarter.

The future home will not simply generate electricity, store it and consume it. It will actively manage energy based on household needs, market conditions and the requirements of the wider grid.

For installers, this represents an important shift. The role is evolving from fitting individual products to delivering integrated energy systems that provide greater value over the lifetime of the installation.

The golden triangle is not simply about combining solar, heat pumps and batteries. Its success depends on the intelligence that connects those technologies and enables them to operate as one.

As homes become increasingly electrified, that orchestration layer will become just as important as the hardware itself.

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Why connected home energy systems are the future

Gav Murray, Director of EV & Solar at Hive, discusses why the 'golden triangle' of solar, batteries and heat pumps is creating new opportunities for installers to deliver smarter, connected home energy systems.

As households look for ways to cut bills, improve efficiency and take more control over their energy use, installers are seeing the conversation move beyond single-product upgrades.

For many customers, the first step might still be solar panels, a battery, a heat pump or smart controls. But increasingly, they are not looking at those technologies in isolation. They want to understand how each upgrade can help their home run more efficiently today, and how it can support further changes in the future.

That is where the idea of the 'golden triangle' comes in. Across the renewable energy sector, the phrase is used to describe the combination of solar, battery storage and heat pumps. Individually, each technology has a clear role. Together, they can help households move towards a more joined-up home energy system that is less reliant on the grid, easier to optimise and better protected from energy price volatility.

For installers, this represents both a major commercial opportunity and a serious operational challenge. A few years ago, solar panels, batteries and heat pumps were often treated as separate jobs. Increasingly, that is not how customers think. They may not be buying three technologies at once, but they are looking for a home energy system that can build over time, with each upgrade making the next one easier to understand.

The ecosystem matters more than the hardware

The real value of the golden triangle is not simply having solar, storage and a heat pump in the same home. It is what happens when those technologies are connected, optimised and working as one system.

That means thinking beyond the products themselves. Generation, storage, heating demand, tariffs and smart controls all need to work together if customers are going to see the full benefit.

The wider market is starting to make connected home energy systems easier for customers to access. The recent British Gas partnership with Sunsave is a useful signal of where this is heading. It offers home batteries with no upfront cost, installation in weeks and tariffs designed to help households store cheaper electricity and use it later.



Gav Murray, Director of EV & Solar at Hive

For customers, this is about more than technology. It is about feeling less exposed to volatile energy costs, more confident in how their home is running and more in control of what they pay.

Customers want simplicity, not complexity

Most customers do not want to become energy experts. They are not interested in kilowatt-hours, inverter specifications or coefficient of performance. What they want to know is whether the system will keep their home warm, reduce their bills and work without constant intervention.

As homes become more electric, the risk is that we expose customers to too much complexity. If solar, batteries, heating, EV charging and tariffs all sit in different silos, the experience quickly becomes confusing. One app becomes five apps, one decision becomes several, and the promise of control starts to feel like another household admin task.

The sector has to move in the opposite direction. Customers should not have to optimise everything manually. The system should quietly do the hard work in the background.



Installers are becoming trusted advisers

This creates a much bigger role for installers. A solar enquiry naturally leads to storage, a heat pump installation raises questions about electricity usage and smart controls. That is how the market will scale, with customers building confidence one step at a time, and each upgrade making the next one easier to understand.

This opens up new revenue opportunities beyond initial installation including system design, servicing, controls integration and customer education. The installer becomes a trusted adviser helping households make a plan, which matters particularly with heat pumps, where customers are often cautious and want reassurance.

The skills challenge cannot be ignored

As more homes move towards golden triangle systems, installers will need a broader skillset than traditional heating or electrical work alone. It is no longer just about fitting one product well but understanding how it may need to work alongside solar, battery storage, heat pumps, smart controls and tariffs over time.

That means confidence in heat loss calculations, system design, electrical integration, product compatibility, commissioning and aftercare. The more connected the home becomes, the more important it is that each installation is designed with the wider ecosystem in mind.

This is not just a numbers issue. It is a confidence issue. Many installers are willing to upskill, but small businesses need to know demand will be sustained before investing in training, tools and time away from paid work.

That is where manufacturers, energy companies and training bodies need to step up. The technology works. The question now is whether we can make it installable, repeatable and commercially viable for the trade.



Support needs to work on site

As well as training, installers need practical support when they are on the job.

That is why we launched the Hive Installer Club as a free-to-join support programme. It provides guided setup workflows, built-in diagnostics, product manuals, how-to videos and priority technical support. The aim is to help installers achieve quicker, more reliable installations with fewer callbacks and greater confidence when working with connected systems.

For independent installers and small businesses, that matters. A callback is not just inconvenient. It costs time, money and customer trust. If we want installers to recommend more joined-up low-carbon systems, we have to make those systems easier to install and easier to support.

Interoperability will decide the customer experience

The golden triangle only works if technologies communicate. When systems do not integrate, it creates frustration for customers and repeat visits for installers. Homes of the future will not be defined by single products but by how well they work together.

Ultimately, the golden triangle is about helping households build more resilient homes, with greater control over their energy use and better protection from cost volatility. But it will not be delivered by technology alone. It will depend on installers who can make complex home energy systems feel simple, trusted and worthwhile.

https://www.hivehome.com



Grid connection: It's not the only path to high performance charging

As the number and size of EV charging sites grows, so does the complexity of powering them from the grid. **Reuben Elman**, infrastructure strategist at Formula Space, looks at some of the businesses that are successfully using batteries and storage solutions as a highly viable alternative to sitting in a grid connection queue.

The electric vehicle (EV) industry's biggest obstacle is still widely considered to be grid connection. When you speak to EV charging operators about their challenges, it sits at the top of the list. Above maintenance and customer experience. Even above cable theft.

Adding new charging sites, or significantly extending existing ones, traditionally means procuring additional grid capacity – which can be expensive and take a long time to achieve. The connections queue is not getting any shorter.

But one could argue this is a problem that operators are choosing to accept – because grid connection is not the only path to high-performance charging.

Alternatives sources of power, including battery energy storage systems (BESS) and microgrids, have been successfully operating in businesses for years. And in the current climate they can deliver a dramatically cheaper, faster, and more flexible approach to charging than waiting in the connection queue.

Batteries enabling high performance motorsport

On the racetrack, high-performance charging from modest grid connections – or none at all – has been routine for several years now.

The 10-year-old fully electric Formula E championship generally races on temporary street circuits in city centres, all locations with no permanent infrastructure or grid connection. Car charging for the race is fully centralised, with each team given access to one standard charger (to charge two cars), for fairness. The energy comes from portable on-site biofuel generation and battery energy storage systems.

Formula 1 is moving in the same direction, though the F1 setup includes solar panels as well as HVO biofuel. Since 2025, a centralised compound has generated and stored this renewably sourced power in battery energy storage systems, making it available not only to all the teams competing, but for all the associated activities, such as the technical centre and the timing room, and the broadcast units.



Reuben Elman, Formula Space

The World Rallycross Championship switched to fully electric cars in its 2022 season, one of the first international championships to do so. Unlike Formula E or F1, this competition is a rapid sequence of short, flat-out heats, semi-finals and finals, often all on the same day. Rather than range, these cars need regular fast charging – which comes from shipping container battery banks, pre-charged to 900kW back at base using local green sources. There's no need for a grid connection at all.

Not only is a grid connection incidental to the performance delivered, but this approach has also delivered a massive 90% reduction in carbon emissions associated with each event.



formula space

Car manufacturers are moving to a similar approach

In the commercial world, EV manufacturers are catching up to the advantages of battery storage beyond the car, too.

For example, Chinese manufacturer BYD's new 1.5 MW Flash Charging stations are paired with an ultra-fast-discharge energy storage system to help bypass grid restrictions. They're paired with a battery that gets recharged from the grid at slower speeds, and can act as both an energy reservoir to prevent grid overload and a power amplifier that enables high-power charging.

When a vehicle plugs in, it draws from that stored energy rather than the grid directly, decoupling the high-power charging event from the grid connection entirely. The result is a system capable of taking a car from 10% to 97% charge in under ten minutes, without requiring a utility-scale grid upgrade at every location.

There are nearly 5,000 Flash Charging station installed across China, and BYD expects a further 20,000 to be in operation worldwide by the end of 2026.

The car park that powers itself

Solar canopy structures – covered bays with photovoltaic panels integrated into the roof – have been available for some time. The canopy panels generate DC electricity which can be used to charge the cars parked below.

The solar power feeds into an on-site battery storage system, which acts as a buffer – accumulating energy during daylight hours and releasing it on demand when vehicles plug in. The grid connection remains part of the system, but it becomes a much smaller part of the proposition, topping up the battery when solar generation is insufficient to meet demand.

The result is that a much smaller grid connection can support a much larger charging operation than it otherwise would. One UK analysis suggests this approach can allow the installation of 125 kW chargers on a connection that would otherwise only support 75 kW, without any grid upgrade, and without any wait.

The connections savings you make depend on the size of the parking areas you cover. But certainly, organisations running larger car parking, such as airports, retail parks, and motorway services, are sitting on a generation asset they have not yet recognised. The infrastructure is available.

Changing perspectives can put you ahead of the curve

These examples all demonstrate that you don't need a massive grid connection to deliver a high-power charging experience.

Grid connection fees and DNO timelines are largely outside any operator's control. But there are flexible solutions available in response to those fixed costs.

Battery-backed microgrids, solar canopy generation, integrated batteries and more – these are all engineered solutions, commercially proven in adjacent sectors, that the EV infrastructure industry has been surprisingly slow to adopt.

These are the conversations the industry needs to be having – not just in procurement teams or engineering reviews, but at the strategic level, where site development decisions are made.

The grid connection queue is a real constraint for EV charge point operators. But it is not the only route.

https://formula-space.com

Not just a car:

Why tomorrow's best EVs will be energy transformers

By **David Mitchell**, UK CGO & Board Director at Futurice.





David Mitchell, UK CGO & Board Director at Futurice

Price, range and charging speed are all integral to the EV experience but they no longer lead the debate. In an era of fierce global competition and fast-emerging tech, the most significant changes are happening beyond the vehicle itself. Tariff and battery software, as well as energy distribution, are now core differentiators for the sector's best and brightest minds.

The timing couldn't be better. BEV registrations rose by 44.5% in July, compared to muted growth a year earlier, giving fully electric cars a 27.5% share of the UK new-car market. No longer a niche technology looking for a use case, EVs are evolving into what could become one of the nation's largest distributed energy resources.

The winners in this new world are not simply producing a fantastic design or installing faster chargers. They are using the latest software to connect EVs to homes, businesses and energy markets, then making the complexity of those connections almost invisible to the end user.

The EV as a flexible energy asset

Futurice's latest Electric 40 report, which ranks the UK's best EV leaders alongside global players, magnifies this trend. The report's number one spot this year went to Axle Energy, which links EV chargers, batteries and heat pumps to electricity markets through a single software layer. In July 2026, the company raised $25 million in Series A funding, and has so far built a network connecting more than 300,000 connected devices, creating more than 2GW of flexible capacity.

This is a useful litmus test of how EV values are expanding. Hardware at home can now become an energy asset without the homeowner necessarily having to change supplier. Axle's integration with energy storage provider Solis allows compatible home batteries to join a virtual power plant, with homeowners earning money as their batteries charge or discharge in response to grid needs. Installers play a key role in helping customers understand, commission and connect the asset.

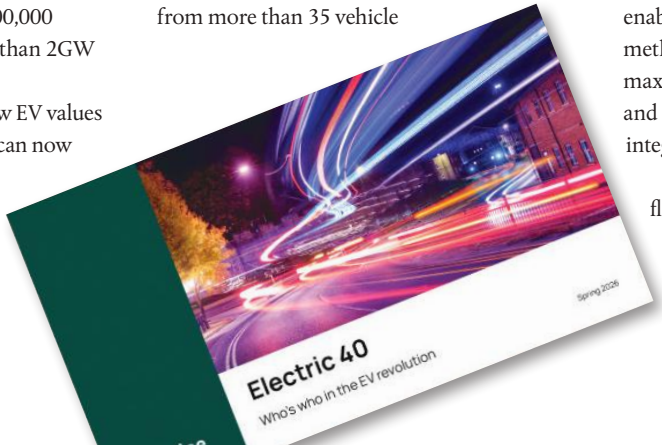
Tariffs are following the same path. Intelligent Octopus Go schedules one-way charging when electricity is cheaper and greener. Octopus Power Pack goes further by scheduling both charging and export, offering free EV charging in return for access to the vehicle's flexibility.

Beyond the UK, E.ON and BMW have activated Germany's first commercial V2G offer for compatible vehicles built on BMW's next-generation Neue Klasse EV platform. Unveiled in late 2025, this is a landmark development, signifying the emergence of a joined-up proposition spanning car, charger, energy contract and grid participation. The result is a connected system that is tougher for competitors to displace.

Fleets: a fertile proving ground

Commercial fleets offer an especially strong test for new EV systems, because they combine large batteries, predictable routes and concentrated charging demand. They also expose the cost of poor decisions quickly. A depot operator cannot electrify successfully by purchasing vehicles first and thinking about power, tariffs and duty cycles later. It all has to happen at once.

Several of this year's Electric 40 contenders are tackling this problem in different ways. Volteras connects real-time data from more than 35 vehicle manufacturers through a cloud API, creating what it calls "the virtual connective tissue" between fleets, chargers and energy services. Fuuse provides the operational layer for enterprise charging, and has worked with partners including EDF and Veolia on V2G trials that test how fleets can return electricity at peak demand.



It has also just launched Fleet 360, a charge point management system that unifies charging activity; from workplace and depot stations to home and public sites. This enables "a single real-time view of all charging methods", to help fleets minimise costs, maximise home charging reimbursement and access more public chargers via one integrated card.

Dynamon, meanwhile, addresses the EV fleet planning question. Its ZERO platform models routes, vehicles, charging infrastructure, depot constraints and energy prices before operators commit



capital to EV growth. In a 4,000-vehicle trial, it identified potential annual energy savings of £22 million and a possible 8,700-tonne reduction in carbon dioxide, having identified the best solution for fleet electrification.

Charger selection and electrical capacity remain fundamental here. But businesses are also seeking out solutions that can exchange data, respond to tariffs, accommodate future bidirectional charging and remain manageable across mixed fleets and hardware brands. At every step, the idea is to use data and advanced AI to optimise one-stop fleet efficiency.

Operational intelligence is therefore as important to fleet decarbonisation as the vehicles at the centre of the shift.

A new type of smart home

The same change is taking place in the home. As it stands, an EV may sit alongside rooftop solar, a heat pump and a stationary battery, each with its own app, tariff and control logic. Left uncoordinated, those assets might work against each other. A home battery may discharge into a car at the wrong time, or charging may begin just when household demand and electricity prices peak.

Zoa, part of SaaS software provider ENSEK, illustrates the platform opportunity. Its software helps energy suppliers coordinate EV charging, solar generation, batteries and smart thermostats through consumer-grade controls. For householders, this means EV charging, solar and battery storage can work together around cheaper, greener electricity.

With Europe setting its sights on battery localisation, the race is also on to make better, faster decisions around battery selection, application and lifetime durability. European manufacturers will also hinge their advantage on the ability to understand, optimise and extend the life of EV batteries.

This is where software and AI can help turn locally produced battery hardware into more intelligent, and commercially valuable assets. Eatron Technologies is embedding AI into battery architecture to predict faults before they occur, while Breathe Battery Technologies is building a modular software toolchain that enhances battery performance across both EV design and broader energy applications.

These cutting-edge approaches play into an interconnected future where EVs and energy systems powerfully overlap; both in the home, and beyond.

UK policy is catching up

The Government's Clean Flexibility Roadmap, updated in July puts smart EV charging and V2X technology firmly within UK energy policy, as a means to reduce charging costs and unlock next-level flexibility. A formal consultation on charge point communication standards is due by the end of 2026, alongside work to make V2X grid connections more consistent.

The roadmap recognises a practical problem. At the moment, electricity exported from a car or domestic battery can face levies despite having already been charged on import. Westminster plans to remove this snag from re-exported electricity.

It's one in a number of regulatory and technical barriers that still need to be resolved. With its policy updates, the UK government is signalling its support of a dynamic model that the tech sector has championed for some time now.

In this new framework, millions of smaller assets respond to price and grid signals rather than electricity flowing in one direction from a small number of generators to passive consumers.

The global EV outlook points to continued strong growth but the standard for success is higher when a vehicle becomes part of the energy system. That means having the workable standards, connections and market rules in place to make bidirectional charging an everyday service.

Platforms must work across manufacturers and devices. Customers need clear consent and control. Installers should be able to rely on straightforward commissioning, dependable support and confidence that products will remain secure through software updates. And energy providers will ideally draw from robust forecasts; rather than theoretical capacity that disappears when drivers unplug.

EV's first chapter was about challenging the internal combustion engine in terms of performance and efficiency. Its next phase is about connecting the vehicle to everything around it. This new story places digital resilience front and centre, with companies that can bring together service design and responsive energy into one standout offering: a runaway asset for the decarbonised age.

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A birds eye view of The Vale Resort

The Vale Resort strengthens sustainability strategy with low-carbon energy investment

We hear about a low carbon energy project delivered by Nuvolt. The Vale Resort has enhanced its sustainability strategy through the installation of solar PV and EV charging points, helping to reduce emissions and support future environmental goals.

The Vale Resort has advanced its long-term sustainability strategy with a major low-carbon energy investment across its portfolio. This was delivered by energy solutions specialist Nuvolt with minimal disruption to guests, members, and elite sporting teams.

Delivering decarbonisation projects within a live luxury hospitality environment presents significant challenges, particularly where guest experience, operational continuity, and brand standards must remain uncompromised. At the Vale Resort, Nuvolt was tasked with translating sustainability ambition into practical delivery across a site that combines hotel accommodation, championship golf, leisure and spa facilities, and elite sporting teams.

Rather than applying a standardised approach, Nuvolt focused on understanding operational demand, site constraints, and guest usage patterns, ensuring long-term environmental benefit without introducing unnecessary complexity or operational risk.

Unused roof space on the golf club building presented an opportunity for on-site renewable generation without impacting the guest environment. Nuvolt designed and installed a high-performance solar PV system capable of delivering consistent, long-term output despite variations in roof orientation and shading.

Alongside renewable generation, Nuvolt also designed and installed six dual 22 kW electric vehicle charging points within the main car park. This supports the growing number of guests and visitors arriving by electric vehicle and aligns with the Vale Resort's wider transport and sustainability objectives.

Steve Leeke Managing Director of the Vale Resort said: "Sustainability is hugely important to us, but it has to work alongside our day-to-day operations. Guest experience and continuity were non-negotiable, and Nuvolt delivered the project with minimal disruption through clear communication at every stage."

Owen Thomas-Thorne, Contracts Manager at Nuvolt, said: "Delivering meaningful infrastructure improvements in a live luxury hospitality environment requires detailed planning and constant communication. By working closely with the Vale Resort and phasing works around operational schedules, we ensured the project was delivered efficiently while day-to-day activity continued uninterrupted."

The completed installation is expected to generate approximately 148.9 MWh of renewable electricity each year, resulting in carbon savings of around 28.8 tonnes of CO_2 annually. By generating clean energy at the point of use, the project reduces reliance on grid electricity during peak periods and strengthens energy resilience across the resort.

The solution delivered by Nuvolt also provides a scalable platform for further decarbonisation as the Vale Resort continues to evolve its sustainability strategy, demonstrating how ambitious environmental goals can be successfully delivered within live luxury hospitality environments.

Sustainability is already firmly embedded within the Vale Resort's operations, supported by continued investment across its diverse and energy-intensive estate. Existing initiatives include on-site solar generation elsewhere on the site, the use of electric golf buggies, and a broader focus on energy efficiency, water management, and biodiversity.

Building on this foundation, the resort was identified as the next area for targeted decarbonisation, allowing the resort to progress its ESG commitments in a practical and measurable way. Nuvolt worked closely with the resort's estate and operational team to develop a solution that aligned with how the golf club functions on a day-to-day basis.

Throughout the installation programme, the Vale Resort remained fully operational, continuing to welcome members and visitors as normal. Works were carefully phased and coordinated around the resort's events calendar, golf schedules, and occupancy, with Nuvolt working closely alongside the Vale Resort's teams to ensure seamless delivery.

https://www.nuvolt.co.uk/

Why combining heat pumps with other technologies is vital in the current market

By **Louise Howlett**, Commercial Director - R A Brown Heating Services.

Whatever term you use for it 'golden triangle', 'holy trinity', or if you expand out to a cluster of five renewable quintessential including; EV charger and off-peak tariffs, these combined installations are vital to successfully sell heat pumps in the UK.

There are significant pros and cons in the UK renewables market - the major con being high electricity prices and the pro being off peak electricity tariffs - this knocks on to getting smart around when a homeowner buys their electricity needed to run their heat pump optimising the lowest running cost for the system.

Case study of award-winning golden triangle project

In 2025 we won an ACR & Heat Pump Award for a 'golden triangle' project. Our customers, Diana and Alun, wanted to achieve what they termed their 'green project'. They live in a 50-year-old riverside townhouse in Norwich. Having bought the property ten years previously, an upgrade project had already been completed, including triple glazed windows and improved insulation. To give some perspective when the couple bought the property it had an EPC rating of E, following the upgrades it achieved EPC C. The property still had a gas boiler.

Next step

Embarking on the 'green project' in 2024 the property owners had very clear objectives; install solar PV on the roof, battery storage in the garage and an air source heat pump in the compact garden to the rear of the property. Part of the project included upgrading the internal garage with a new door and insulation - this space was to be utilised as a plant room and the location for the batteries.

Diana, took on the role of project manager and called a meeting in the garage - gathering the garage door contractor, the electrician and R A Brown's engineer - the positioning of all of the equipment was measured out with millimetre precision.





This was an extremely successful strategy as not only did all of the equipment fit but the functionality of the space was retained - shelving was built and the boat that is stored in the garage still had its home.

Returning to the aim of this couple's project, which was really three pronged:

1. Get rid of gas - decarbonisation
2. Reduce household bills to as near zero as possible
3. Achieve an EPC rating of A for a retrofit project

By combining all of these technologies with the fabric improvements all three goals were achieved - Diana gave me an update for publication in my book (Warm Wisdom: A Stress-Free Guide to Finding and Fitting the Right Heat Pump for Your Home) In October 2025 she said

"Since the initial project was completed we have had three more batteries, another inverter and ten more solar panels installed (on the front of the house), and our monthly bill has gone down from £70 to a notional £1 – the house effectively pays us to heat and light it!

We have had the heat pump tumble dryer since last November, and we like it a lot."

"... our monthly bill has gone down from £70 to a notional £1 – the house effectively pays us to heat and light it!

Lessons we are learning from consumer behaviour

With electricity prices remaining high compared with mains gas it is natural that motivation to switch to a heat pump rises significantly when a homeowner begins to be interested in micro-generation of electricity and the benefits of storing electricity. One of the common triggers is getting an EV - the idea of harnessing free fuel via solar panels is attractive and this creates a cascade effect.

Once a homeowner has invested in solar PV and batteries the direction of travel is clear; awareness is raised to the potential of creating their own energy security and low bills.

Celebrating recognition of our achievements

The ACR & Heat Pump Awards provide an opportunity for us to showcase the projects and collaborative work that we have worked on. This year we were delighted to win an award for a different type of project: a commercial air source heat pump project.

It was an installation that we completed at a school for disabled children. After several years of planning, it came to fruition with an incredibly old boiler being replaced by four air source heat pump units.

This is an area of business development for us - moving into what we call small commercial work that fits with our work on the rural estates and halls in Norfolk and Suffolk. We feel this type of work utilises our skills. It is also more achievable for us to compete for this 'high end' work. I'm sure we're not the only established 'artisan' installer that feels winning work for normal homeowners in the able to pay market is quite difficult now compared to in the RHI era. All kinds of business costs have increased so sharply including training apprentices.

This is another reason why winning national awards gives us increased credibility and hence added 'value'. For homeowners venturing into a new to them technology, trust is so vital and winning awards helps to provide the external validation.



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To do or *not* to do... that is the mounting question

Placement of your air source heat pump (ASHP) is important, but you cannot always get the ideal location. **Paul Greengrass**, Product Development Director from DiversiTech answers some questions on mounting your ASHP unit.

Correct siting and mounting of an ASHP unit is a critical factor influencing system performance, customer satisfaction, and long-term reliability. As installers, we know that a well-installed unit (with the correct maintenance) will run efficiently for 15–20 years — while a poorly positioned one can lead to callbacks, noise complaints, and avoidable performance issues. Getting it right at the install stage saves time, protects performance, and strengthens client confidence.

What are the key considerations when deciding how to place an ASHP unit?

ASHPs must be allowed to breathe to allow the unit to perform efficiently. If the airflow is restricted, this will lead to inefficiency and unnecessary wear on the compressor. Maintain manufacturer's recommended clearance to sides and rear and allow a discharge zone in front of the fan. Planning compliance should be considered during initial survey and not left to paperwork at the end.

What kind of base ensures stability?

Get the base right! The mounting base must support the unit through its operational life. Movement will lead to vibration, refrigerant stress and noise transfer. A concrete slab (minimum 100mm thickness) on compacted hardcore needs to be installed level. It needs to be raised slightly above surrounding ground to prevent pooling water. Anti-vibration feet will greatly reduce any noise that the unit makes. DiversiTech recommends the FLEXI Lite Slab kit as it is a cost (and time) effective alternative to a concrete base.



Installing using FLEXI Lite Slab Kit

This innovative solution comes complete with rubber mounting anti-vibration feet (2 or 3-foot options) and is available in a range of sizes (175mm thickness inclusive foot). This kit can be delivered to site and constructed easily, and is a fibre reinforced concrete coated slab independently tested to varying weather conditions and exposure to chemicals.

Can ASHPs be mounted on a wall?



Installing using brackets

Wall brackets can work well on sites with limited space - or when you need to raise the unit. The wall must be structurally sound and load bearing. DiversiTech brackets are flat packed and easy to assemble – and provide a professional finish to the installation. The crossbar (complete with spirit level) allows the uprights to be spaced exactly as required and include wall spacers to help level the unit.

These brackets are powder coated in a scratch resistant textured finish and undergo a complex weather protection process to combat corrosive environments. Condensate trays are available to fit most standard units when considering a drainage strategy. They are available in a range of sizes and colours with 2 or 3-arm versions – with different load capacities.

What can you do if an uneven ground mount surface is the only option?



In some cases, structurally sound wall mounting and a flat level ground mounting surface is not available. The Baby Sumo adjustable rubber support anti-vibration feet are the idea solution when you need to support units on uneven or sloping surfaces. They have an adjustable height between 160-210mm and are made of SBR vulcanised UV-stabilised recycled rubber compound with internal glass fibre-reinforced polypropylene.

The support surface features a substantial contact area offering a stable and secure base which prevents water stagnation and seepage.

Installing using adjustable feet

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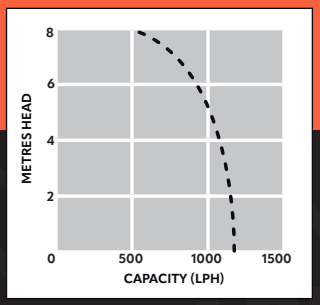




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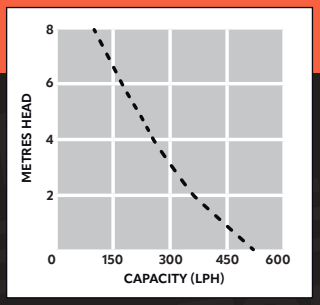
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When customers go silent:

Expert shares what tradespeople can do if payment chasing drags on

By **Rob Rees,** Divisional Director at Markel Direct.

Late payments are one of the biggest pressures facing small business owners, including tradespeople. While some customers will be open about delays, others stop responding altogether, leaving businesses unsure whether they are dealing with a communication breakdown, a dispute or payment avoidance.

For many sole traders and small businesses, waiting on payment is more than just frustrating. A recent study, which explored tradespeople's experience of working with homeowners, found that prompt payment was valued the most by 47% of the 500 UK tradespeople surveyed. With fuel, materials and other overheads continuing to rise, delayed invoices can quickly put pressure on cash flow and everyday business costs.

Rob Rees, Divisional Director at Markel Direct, the trades business insurance specialist, provides expert tips for tradespeople on how they can handle overdue invoices and what steps they should avoid if payment chasing begins to drag on.

1 Remember that silence does not always mean refusal

One mistake tradespeople can make is assuming that a customer ignoring communication, or not responding, automatically has no intention of paying.

Some customers do not like admitting they are struggling to pay, with 24% of adults finding it difficult to get by financially, while others may have experienced changes in their personal life which has distracted them.

Even so, tradespeople should not leave things for weeks without following up.



Rob Rees, Divisional Director at Markel Direct

Before assuming a customer is refusing to pay, it is worth checking whether the invoice was actually received, whether the payment terms were properly explained beforehand, and whether the customer has raised any concerns about the job. Sometimes the issue can be as simple as an old email address, or the customer being away or off ill.

It is also a good idea to keep copies of invoices, emails and reminders in case the situation later turns into a formal dispute.

2 Start with regular follow-ups

Once those initial checks have been made, consistency is key. Repeated calls made out of frustration or emotional messages can sometimes make disputes harder to resolve.

A better approach is to keep communication polite, clear and consistent. Shortly after the payment deadline passes, send a friendly reminder confirming the invoice details and amount owed. If there is still no reply a few days later, follow up again in writing to ask whether anything is holding payment up.

If communication continues to dry up, try a mix of channels such as email and phone calls, while keeping everything factual and professional.

3 Avoid actions that could weaken your position

Not being paid, of course, causes frustration, but it is vital that this doesn't result in actions such as public venting, naming and shaming, making threats or any other action which could weaken your position, should the matter escalate.

Certain actions can create legal issues or reduce the likelihood of recovering payment. Some actions that tradespeople should avoid include:

- Turning up unannounced at a customer's home or business repeatedly
- Posting accusations on social media
- Removing installed items or undoing completed work without legal advice
- Making threats

Even where payment is overdue, businesses still need to act reasonably and professionally, as poorly handled disputes can sometimes become more damaging than the unpaid invoice itself.

4 Understand your rights under late payment legislation

Where work has been carried out for another business rather than a homeowner, tradespeople may be protected under late payment legislation.

Under the Late Payment of Commercial Debts (Interest) Act 1998, later amended in 2013, UK businesses are legally entitled to charge statutory interest on overdue business-to-business invoices where no alternative interest terms have been agreed.

The legislation allows creditors to add interest at 8% above the Bank of England base rate, alongside fixed compensation fees ranging from £40 to £100 depending on the size of the debt, as well as reasonable debt recovery costs. If no payment date has been agreed, invoices are generally considered overdue after 30 days.

The legislation is designed to help protect small businesses from the impact of late payments and encourage faster settlement of outstanding invoices. While it does not always guarantee that payment will be received, referencing the legislation in formal reminders can demonstrate that the tradesperson understands their legal position and is prepared to escalate matters if necessary.

On 19th May, ministers introduced the Small Business Protections Bill in the House of Lords, aimed at supporting small businesses affected by late payments. The proposed reforms include a 60-day cap on payment terms and mandatory interest on overdue payments set at 8% above the Bank of England base rate. While a date for the second reading has yet to be confirmed, these changes could provide much-needed support for tradespeople and small businesses dealing with late-paying commercial clients.

5 Know when to seek support

There comes a point where continued chasing can become time-consuming, stressful and commercially unproductive.

If communication has broken down entirely or the amount involved is significant, seeking professional support early can often prevent the situation from deteriorating further and help businesses avoid procedural mistakes that could weaken a future claim or recovery process.

This is where having the right trades insurance in place can also make a difference. At Markel Direct, all our policyholders receive access to a 24-hour legal advice helpline offering debt recovery guidance, helping tradespeople understand their rights and pursue unpaid invoices more effectively without taking time away from running their business. They also have access to the Markel Business Hub for practical guidance, covering everything from collecting a debt to avoiding unreliable payers.

Prevention is still the best protection

While no business can eliminate the risk of late payments entirely, preventative steps can significantly reduce problems later on. Tradespeople should aim to:

- Use written contracts and detailed quotes
- Clearly outline payment terms before work begins
- Invoice promptly
- Break larger projects into staged payments where possible
- Keep written records of approvals and communication
- Follow up on overdue invoices quickly rather than letting delays build

Having clear systems in place not only improves professionalism but can also make customers more likely to prioritise payment in the first place.

Please note: This article provides guidance for information purposes only. It should not be relied upon wholly when making or taking important business decisions – always seek the services of an appropriately qualified professional.

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UKSOL Plug-In Solar Pro first to reach key UK compliance ahead of consumer launch

British owned solar company prepares for the emerging UK plug-in solar market with safety, standards and consumer confidence at the heart of its new product

British-owned solar company UKSOL is the first solar company that has reached significant regulatory compliance through the Energy Network Association (ENA) Register for its new UKSOL Plug-In Solar Pro system as it prepares to bring accessible plug-in solar technology to UK households.

Following the completion of the relevant technical assessment process, UKSOL has now secured formal "Compliant" listings for four products in its Plug-In Solar Pro range on the ENA Connect Direct plug-in solar device database.

The approved systems are the UKSOL Plug-In Solar Pro Compact 460W Single Panel Ground Mount Kit under system reference UKSOL/21002/V1/A2; the UKSOL Plug-In Solar Pro Duo 890W Two Panel Hybrid Mount Kit under system reference UKSOL/21007/V1/A3; the UKSOL Plug-In Solar Pro Compact 515W Single Panel Hybrid Mount Kit under system reference UKSOL/21008/V1/A4; and the UKSOL Plug-In Solar Pro Advanced 920W Two Panel Hybrid Mount Kit under system reference UKSOL/21014/V1/A4.

This can be found on the ENA Connect Direct plug-in solar device database: **https://connect-direct.energynetworks.org/device-databases/search-gen?device_type_id=14**

The compliance comes as the UK prepares for the introduction of plug in solar. UKSOL has been developing its Plug-In Solar Pro proposition specifically with the emerging British market in mind, with a strong emphasis on electrical safety, product quality, clear consumer information and long-term support.

The company is preparing an **all-in-one consumer package**, bringing together the solar generation equipment and associated components required for a straightforward household solution and is currently developing its retail and distribution strategy ahead of the wider UK rollout.

Further details of the UKSOL Plug-In Solar Pro product and its consumer launch will be announced shortly.

UKSOL Plug-In Solar Pro™

First 9-in-1 heat pump transforms load into an energy hub



Differ Power and Tesla veteran Drew Baglino's Sadi are treating the heat pump as the home's energy core by pairing AI data center cooling with automotive-grade thermal tech.

The D1 Series is described as the world's first 9-in-1 integrated solar-storage air-to-water heat pump system, combining space heating, cooling, domestic hot water, PV inversion, battery management, PCS, backup power, home energy management, and gateway control into one platform. It uses the low-GWP refrigerant R290 and is designed for European residential heating, cooling, and domestic hot water.

Conventionally one of the largest electrical loads in an electrified home, the heat pump here becomes the point where rooftop PV, battery storage, thermal demand, backup power, and household supply are coordinated. Rather than installing a separate heat pump, solar inverter, battery controller, and energy manager side by side, the D1 Series brings these functions into a single platform.

With hybrid solar inversion integrated at the architecture level, the heat pump can work directly with PV and battery power, reducing some of the repeated AC/DC and DC/AC conversion stages associated with separate PV, storage, and heat pump installations. The platform can potentially improve overall system efficiency by more than 10%, through direct-drive operation, combined battery and thermal storage control, and energy-management algorithms. The system also follows available solar output, responding to PV generation rather than relying only on fixed schedules or basic external control signals.

Differ Power will present the D1 Series at Intersolar Europe 2026, Hall C2, Booth 655.

info@differpower.com for more information.

SOLARWATT Showcases Battery vision 2.0 as Demand Grows for Integrated Home Energy Systems

As the UK energy market continues its transition towards smarter, more connected energy systems, SOLARWATT will showcase its latest residential energy storage technology at Solar & Storage Live UK 2026 (22nd-24th September 2026) Stand A36

Part of the complete SOLARWATT Home system, Battery vision 2.0 combines with premium glass-glass solar modules, intelligent energy management, EV charging and backup power solutions to create a seamless, integrated energy solution for modern homes. As homeowners increasingly look beyond solar alone, installers have a growing opportunity to deliver higher-value projects that combine generation, storage, mobility and smart energy control through a single trusted supplier.

At the heart of this year's showcase is Battery vision 2.0, which delivers significantly higher storage capacity while maintaining virtually the same footprint as its predecessor.

To learn more about Battery vision 2.0 and the complete SOLARWATT Home system, visit SOLARWATT on Stand A36 at Solar & Storage Live UK 2026.



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