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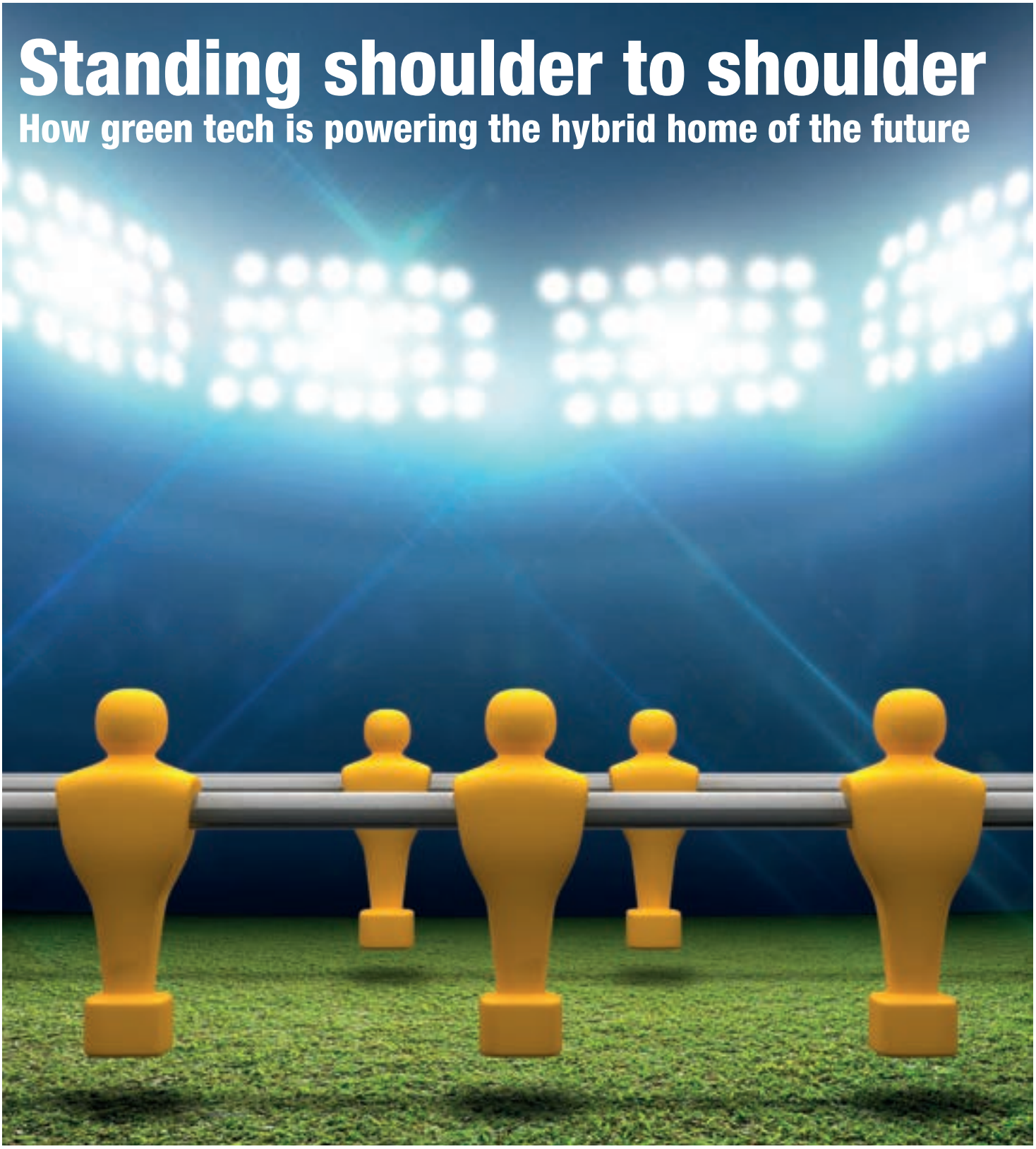
How green tech is powering the hybrid home of the future



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Another month, another consultation

Another month passes and Energy Ministers deliver another consultation proposing yet further cuts to the subsidy support the Government provides to fund the roll-out of renewable energy.

The latest in a lengthy string of planned reductions targets the Anaerobic Digestion sector, as the market was enjoying a time of growth and stability.

The Government points out that when the Feed-in Tariff scheme was launched in 2010, DECC projected 100 installations equating to 160MW of installed capacity by 2020/21. By the end of March 2016, the number of installations accredited under the FiTs scheme was 250, with an installed capacity of 177MW

Farm leaders have already expressed their shock and horror at the plans from DECC, which says that from January 2017 tariffs for plants under 500kW will be cut by more than a quarter and the tariff for plants over 500kW will disappear completely, moving from 7.8p/kWh to zero.

The National Farmers Union said it would fight the cuts and pointed out that only two years ago the FiT for small- and medium-scale AD plants were 14-15p/kWh, nearly three times the rates proposed from 2017. But there had been no corresponding reduction in capital costs.

Policy makers claim the implementation of the proposed changes would not adversely affect the UK's ability to meet its renewable electricity and carbon reduction targets. But yet again, the alarm bells are ringing that Whitehall's dash for gas is at the expense of sustainable and community-led energy projects.

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Sales director: Jonathan Hibbert
Circulation manager: Berni Chetham
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Editorial/press releases
Tel: 01565 653283
Email:stuart@andpublishing.co.uk
www.renewableenergyinstaller.co.uk

In brief

Sharp to invest in solar
Following months of uncertainty, Foxconn chairman Terry Gou has confirmed his total commitment to Sharp's solar business, and pledged to "preserve, strengthen and expand" the brand in order to provide new and innovative solutions for years to come. The fresh support for Sharp's Energy Solutions division is seen as a vote of confidence for the industry as a whole.

Fresh consultation
Energy Ministers have launched a new consultation on proposed changes under the Feed-in Tariff scheme for anaerobic digestion (AD) or micro-combined heat and power (mCHP). The key mCHP proposals include a deployment cap of 3.6MW to the end of 2018/19 with a 10% contingent degression of the tariff should the ceiling be reached.

Powering homes of the future
New research has revealed the Britain of the future, where wind turbines are a garden essential for every UK homeowner and the only way to watch the TV is if a member of the household is prepared to get their heart rate up. Further power predictions include water turbines stationed in gutter pipes, and bathroom drains; as well as floorboards that harvest energy as you walk across them, and all traditional roof tiles featuring integrated solar technology.

The poll was conducted by the team behind Gocompare.com Energy in order to investigate what predictions the public hold for the future of their homes. A total of 2,876 British homeowners took part in the study.

Lark Energy expands into new premises
Lark Energy, the award-winning provider of renewable energy solutions for industrial, commercial, housing and mixed-use developments, has expanded into new premises.

Lark Energy is part of The Larkfleet Group, a privately owned construction and development group based in Bourne, Lincolnshire. Now the Lark Energy business has moved into the office block adjacent to the group HQ.

Lark Energy's expertise lies across a range of renewables technologies, including solar PV and biomass. It is a major developer of solar farms and roof-top solar panel systems for warehouses, factories and other large buildings.

Independent renewable generators deliver nearly 8% of UK power demand

Independent renewable generators are central to Britain's low-carbon transition and now supply 7.6% of UK power demand, with more than £1 billion of clean electricity. Independent solar capacity in the UK grew by 83% in 2015 with 696 new projects providing over 2GW.

However, independent generators now face a crisis. Wholesale electricity prices fell more than 20% in 2015, largely as a result of cheap oil and gas. Although overall independent renewables capacity grew by 28% over the year the wholesale value of the electricity the sector generated dropped by more than 4%.

Robert Groves, CEO of SmartestEnergy, said: "Energy entrepreneurs are indispensable to Britain's energy future, driving change towards a flexible, efficient, low-carbon power system." He added: "The Government needs to restore confidence to the industry by providing stable policy and certainty over future subsidies available to the industry."

Dulas and Innovatec link up to find solutions for high energy users

Dulas, a leading developer and renewable energy service provider has partnered with Italian energy efficiency business Innovatec to provide energy management services for high energy users to assist with the move towards demand reduction and onsite renewable energy generation.

As high energy businesses in the UK face cost pressure to their operations from rising electricity prices, there is a clear market need for services that enable high energy users to make real, cost-effective energy savings.

While installing renewable energy technology on-site has become an established means of creating additional revenue streams and offsetting high energy costs, in light of changing market conditions and the steady removal of clean energy support mechanisms across Europe, utility, agricultural and industrial users will increasingly need to reconsider how they consume electricity.

The new Dulas-Innovatec service will encourage businesses to fully understand their existing energy use profile and reduce demand, before then looking at the best energy technology for on-site generation.

Green energy firm one of Britain's fastest growing companies

Energy efficiency solutions provider Anesco has achieved a 33% growth in revenue in the last financial year, with its turnover now hitting £213m and an operating profit of £25.1m.

Reading-based Anesco, which recently topped the Sunday Times Profit Track 100 list, is one of the UK's fastest growing companies with a turnover of £500m forecast by the 2019/20 financial year. It works with businesses, local authorities and homeowners to cut carbon emissions, with services including solar PV, ground source heat pump and LED street lighting design, installation and maintenance.

CEO Delvin Lane said: "We've never been afraid to challenge the norm and find new technologies and techniques to drive the sector forward. It's what's helped us open up new markets and dramatically increase our turnover and workforce."

Anesco led the way in commercial-scale battery storage, with over 20MW in operation, construction or delivery. It was also the first to roll out residential battery storage solutions and to launch the ESCO model, which offers organisations fully funded energy efficiency solutions, in the UK.

Plans to cut red tape create challenge for plumbing and heating sector

Business Secretary Sajid Javid has promised to address employment rules that prevent employees from starting up their own business after leaving a job.

Currently 'non-compete clauses' can be added to employment contracts, preventing individuals from competing against their former employer or working for a competitor for a set period of time. Government is now launching a call for evidence, asking whether this type of practice is acting as a barrier to innovation and employment.

The move forms part of the Government's Innovation Plan, which covers areas such as how better regulation can drive innovation and opportunities to use the millions of pounds spent on public procurement every year to support new and exciting businesses. The new online survey will be looking for ideas on how to ensure the plan is a success.

John Thompson, Chief Executive of the Association of Plumbing and Heating Contractors, said: "Reforms to non-compete clauses would present employers in our industry with a significant challenge, with the constant threat of employees taking advantage of the skills and experience they have acquired in their time at a company to purloin its customer base. As a result, it's incredibly likely that employee training and development would be stifled, disadvantaging members of our industry as they attempt to progress in their careers."

Latest version of Cosy smart thermostat launched with option for two-zone split

geo, the pioneering developer of smarter energy products and services for consumers, has announced the launch of a new, feature-packed, version of its popular home heating system, Cosy, which helps users to control their heating at home and remotely.

Cosy 3 now offers the ability to work with a twin zone heating system. A second Cosy display can be paired with the system and will work as the thermostat for the second zone. It can be selected from either a standard or limited edition display. Additionally, the solution, which has been designed to provide both simplicity and reliability, offers hot water control, suitable for homes that have a hot water tank. The installation of a hot water extension pack will allow users to switch their hot water on and off from their Cosy display or mobile app in the same way as their heating.

Dimplex welcomes VAT decision on renewables

Heat pump manufacturer Dimplex has welcomed the Government's announcement that it is to keep the reduced VAT rate on energy-saving materials including heat pumps and solar panels.

Following a European Court of Justice ruling that the reduced 5% rate breached EU laws, it was widely expected that HMRC would be forced to increase the rate to the standard 20% – effectively leading to a 15% overnight price increase on the supply and installation of energy-saving materials. However, the Government confirmed last month that the 5% rate will remain.

Chris Stammers, Product Marketing Director at Dimplex, which produces a range of domestic and commercial heat pumps in its UK manufacturing facility, said: "The renewable energy market is just starting to grow as consumers begin to understand how much they can reduce their running costs but this rise in VAT would have had a serious impact on the uptake of heat pumps and other renewable technologies.

"We join other manufacturers and industry bodies in welcoming the Government's decision that the reduced VAT rate will remain in place, and are confident that this decision, together with other policies such as the Renewable Heat Incentive, will help the renewables market continue to thrive in order to help meet the UK's ambitious energy targets."

OFTEC registrations to now include biomass installation

OFTEC has announced that biomass registration (OFT505) is now available to all installers, completing its range of competent person and microgeneration certification scheme services.

Technicians can sign up and benefit not only from OFTEC's traditional oil registration services, but also solid fuel, Part P and the three most popular renewable heating options: heat pumps, solar thermal and biomass.

Like OFTEC's other renewable scopes, biomass registration enables technicians to self-certify installations in accordance with building regulations in England, Wales, Isle of Man and the Channel Islands, and also includes the option to add MCS registration.

OFTEC's Registration Director, Adrian Lightwood, said: "Adding biomass to our registration portfolio completes our range of off-grid products and consolidates OFTEC's position as one of the leading competent person scheme providers within the heating industry."

Technicians need to hold an independent qualification mapped to the relevant QCF units or the new ROF units. Alternatively, applications can be made via the 'experienced worker route' for those with demonstrable experience and manufacturers' training.

£11bn investment in UK solar driving rise in M&A activity

Solar M&A activity is on the increase following £11 billion worth of investment in UK solar projects since 2013, according to statistics collected by Clean Energy Pipeline for a joint report with UK law firm TLT.

The report, 'UK Renewable Energy Finance 2016', found that in 2015, the number of deals tracked by Clean Energy Pipeline increased by 14%, representing a total acquisition of £1.6 billion of solar assets. The first quarter of 2016 looks equally robust with £333 million already reported.

TLT's Maria Connolly, Head of Real Estate and Energy & Renewables, said: "The number of solar projects brought online in the last two years has created a large pool of de-risked assets that are attractive acquisition targets for institutional and other low-risk investors. This is likely to continue well into 2017.

"Many transactions in the early part of 2016 relate to disposal of operational projects that were commissioned by 31 March 2015 or the disposal of consented projects that qualify for the grace period.

"The main activity is coming from the refinancing of ground mounted, commissioned solar PV. A number of these refinancings are for 1.4 ROC projects that were installed at the end of March 2015 or projects which have been built under the 1.3 ROC regime and recently commissioned."

Attractiveness of UK renewables 'on a landslide', says EY report

The combination of historic energy policy announcements making their impact felt and ongoing uncertainty over the role of renewables in the UK's future energy mix is undermining the sector's appeal to investors, says a new report.

According to EY's Renewable Energy Country Attractiveness Index (RECAI), published last month, the UK has slipped to an all-time low of 13th place among the 40 most attractive renewable energy markets globally – down from 12th in September 2015.

The report cites the Government's decision to opt for gas and nuclear to fill an anticipated energy supply gap as the key reason for the UK's fall. In addition, the early closure of the Renewables Obligation regime and the end of Contracts for Difference after a single round have limited the routes to market for electricity generated by onshore wind and solar power.

The RECAI warns that investment in new projects could also fall drastically from 2017, following current record levels of activity, attributed to developers rushing to meet deadlines before support is withdrawn.

Ben Warren, EY's Energy Corporate Finance Leader, said: "A non-committal approach to energy policy is putting the attractiveness of the UK's renewable energy sector on a landslide. The current approach is going against the grain of almost universal global support for renewables and is masking the UK's advantages – a growing energy imperative as ageing power plants are retired, strong natural resources and efficient capital markets."

Ecotricity receives planning permission for pioneering hybrid energy parks

Ecotricity has gained planning permission to build two new sun parks in Bulkworthy in Devon and Dalby in Leicestershire, which will join with existing wind farms to create some of the first hybrid energy parks in Britain.

It also has the go-ahead to extend the UK's first hybrid energy park at Fen Farm, Lincolnshire, with an additional 5MW of solar capacity.

Hybrid renewable energy parks combine wind and sun generation in the same project using the same grid connection – a more efficient approach to green energy generation.

All three projects will see 18,000 solar panels installed, powering over 1,000 homes and each saving nearly 2,000 tonnes of CO2 per year.

STA and PwC launch survey to determine status of UK solar

The STA and PwC have launched a survey to assess the status of the UK solar industry after major changes to the policy framework for solar power in the UK. The confidential online survey is open to all solar companies based in the UK to respond to over the next two weeks. The results will be given to Ministers and published in a public report in early summer.

STA Head of External Affairs Leonie Greene said: "Solar has had the great majority of its support removed very rapidly in the UK, and just when it had parity with fossil fuels within sight. At the STA we know many solar companies are having a difficult time and indeed some have been lost, and with them some highly skilled people.

"However, it is important that we systematically quantify what the impact of these policy changes has been in order to provide a really clear and accurate picture. A comprehensive survey is essential for an informed discussion with Government and Parliament and there will be strong interest in how the industry is faring. Partnering up with PwC means we can ensure the high quality analysis this important industry deserves."

The Renewables Obligation has ended early for the solar industry, and no future auction rounds under Contracts for Difference are anticipated. Deployment in domestic solar has dropped 80% under the Feed-in Tariff compared to last year. Commercial solar roof deployment under FiTs is capped at 15MW per quarter.

While the Government also dropped Zero Carbon Homes, moves by the Scottish Government to improve new build standards are creating opportunities and it appears that the new London Mayor will also move to support solar deployment across the capital.

John Dashwood, Head of Renewables, Assurance at PwC said: "The solar industry is exceptionally innovative and adaptable. However, it is undoubtedly facing some serious challenges in the UK. How authoritative our report is will depend on how many companies respond – so we urge companies to please do so."

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Investment in energy storage vital if renewable energy to achieve full potential, new study finds

Government subsidies should be used to encourage investment in energy storage systems if renewable power is to be fully integrated into the sector, according to researchers at the University of East Anglia (UEA).

Variable output renewable energy systems, such as wind turbines and solar panels, are growing across Europe and contribute to supply and price volatility in electricity markets. Systems for energy storage, for example reversed hydro power plants, large scale compressed air systems and batteries, provide ways to compensate for this variable power supply by storing excess power and releasing it when there is a production shortage.

The researchers argue that as the amount of renewable energy entering national power grids increases, so does the potential impact of volatility and therefore the need for storage. Therefore, as subsidies for setting up renewable energy projects are gradually being removed, because they are reaching market maturity, these funds should instead be used to develop storage systems that could provide viable investment opportunities.

The study, led by Dr Dimitris Zafirakis and Dr Konstantinos Chalvatzis of UEA's Norwich Business School, explored the potential of energy storage systems to return profits by buying when energy is cheap and selling when it is expensive, known as arbitrage. They tested this in a number of European electricity markets and matched various trading strategies and storage technologies with market characteristics.

The researchers found that this buy cheap, sell expensive approach alone cannot provide adequate revenue to justify investment. However, if the decarbonisation of electricity is to be achieved by increasing renewables, investment in storage has to be encouraged, for example through a combination of arbitrage and state subsidies. The findings are published in the journal Applied Energy.

Dr Chalvatzis, a senior lecturer in business and climate change, said: "It is good to adjust subsidies for renewable energy technologies that have reached maturity, but you have to start thinking about subsidising storage, as this can take us to using 100% renewable energy sources.

"We need sufficient storage and more investment in storage systems in order for renewable energy to reach its full potential. Subsidies would encourage investment, which in turn would enable further integration of renewables into the energy sector.

"The fact that for some days countries such as Germany and Portugal are running their entire electricity network exclusively on renewable energy shows how far we have come to rely on it as a power source and this will continue to increase."

Despite this, investment in energy storage has been limited until now, largely due to the high capital costs of most systems. Therefore the researchers suggest that the main focus should be on multiple grid services and associated welfare effects, such as reduced consumer energy costs and increased energy security, that energy storage technologies can provide, triggering in this way state support and market incentives.

The study focused on two types of storage systems – pumped hydro storage (PHS) and compressed air energy storage (CAES) – examining different energy trade strategies and representative European power markets, including the APX Power UK.

Integrated solar energy and battery storage system highlights benefits

A battery system that could allow businesses to reduce peak demand charges, shift energy consumption patterns and maximise the potential of renewable energy generation has been installed as part of a research project looking to tackle the challenges of commercial and industrial-scale energy storage.

E.ON has installed the Vanadium Redox Flow Battery (VRFB) technology from redT at the headquarters of warehousing and logistics company JB Wheaton in Chard, Somerset. The 5kW, 40kWh demonstration battery will work alongside the company's 3.5MW solar panel arrays and is designed to help smooth out the peaks and troughs of the company's energy demand. The battery should allow JB Wheaton to make best use of the solar panels when they are generating more energy than can be consumed on-site and can also store power from the grid at times of cheaper prices and low demand.

E.ON is trialling the system to understand the potential for improved payback on solar PV installations in commercial customers. This will be achieved by storing a company's solar power so a greater proportion can be used on-site. In the case of JB Wheaton this may mean allowing the company's electric cars, vans and forklifts to be charged overnight using energy generated during the day. In addition, the company is looking to minimise the amount of energy it imports from the grid at periods of high prices.

Alongside the analysis of these benefits, the system will allow E.ON to examine the potential of such systems in providing ancillary services to help support the National Grid.

Eliano Russo, Head of Energy Storage Solutions, at E.ON, said: "A key issue in using renewable energy sources is that the times of peak generation don't always match the periods of high demand. We believe technologies like this could help our customers to cut their bills and reduce carbon emissions, at the same time as improving security of supply.

"Battery storage allows businesses to play a greater role in the energy system; adding an income stream as well as avoiding higher unit costs. We have recently launched a residential PV and battery storage product to our customers in Germany and as we develop our experience from this project with JB Wheaton we are interested in speaking with commercial and industrial customers in the UK who would be interested in investing in a battery storage solution."

Scott McGregor, CEO of redT, added: "This installation will showcase how energy storage can add value through 'revenue stacking'

of multiple services for a wide range of stakeholders. The theme of 'distributed energy storage' is an area that has been embraced by leading utility companies such as E.ON and we are confident in its further development.

"Distributed energy delivers valuable local economic benefits to the customer as well as providing essential reliability of grid services to the energy company. This agreement is a prime example of how E.ON and JB Wheaton can work together to achieve a mutually beneficial, shared goal using redT technology."

Mark Wheaton, Director of JB Wheaton & Sons Ltd, said: "Considering the cheap supply of daytime solar power from our photovoltaic cells and the need for overnight charging of our electric vehicles, we're excited to take advantage of, and better understand, the potential savings and efficiencies of installing a redT energy storage system. Provision of services by utilities, in the face of global environmental concerns, is rapidly evolving, so we, as both a consumer and green electricity supplier, want to evaluate the market opportunities that E.ON is actively anticipating."

A key challenge for renewable energy generation is that production is not necessarily well matched to consumer demand. Flexible options such as batteries could help make the electricity system more robust, greener, and cheaper to build and operate. The benefits of battery storage, currently being tested, could include:

For the customer:

- Maximising on-site consumption of renewable energy generation, improving payback times for PV arrays
- Minimising the amount of electricity imported from the grid, reducing bills
- Increased energy independence, reducing reliance on the grid
- Smart charging during off-peak pricing periods can also help to reduce bills – the electricity in the battery can then be used at the most expensive times of day instead of importing from the grid
- Intelligent management of peak demand, reducing transmission charges, especially at peak periods
- Potential to use the battery for back-up power in the event of power outages.

For the utility:

- Storage could help support the electricity network, potentially deferring or avoiding the need to make expensive upgrades to local infrastructure
- Batteries can help to maintain local voltages within statutory limits – an increasing problem as more renewables connect to the network.

For the UK energy system:

- Reduced demand on the national grid at peak periods, meaning greater flexibility when it comes to scheduling generating plant, helping to reduce bills, leading to carbon and cost savings
- Storage can help to integrate more renewable generation into the energy system, reducing overall carbon emissions
- Energy storage can provide very rapid support to the National Grid in the event of grid problems, in this way increasing system resiliency.

CO2 heat pumps

Garry Broadbent of Green Thermal Energy discusses the potential for commercial CO2 heat pumps

Much has been said about the potential that commercial CO2 heat pumps can offer the renewable sector in terms of making retrofit applications more accessible and practical to design and install.

A CO2 Heat Pump is able to provide high operating temperatures along with high efficiency, meaning that heating distribution systems could need less modification than is required when a standard 45°C Heat Pump is considered for a retrofit application.

Therefore, when it is considered that the growth in the applications of commercial biomass boilers was at least partially driven by their ease of application in comparison to heat pumps, would we be likely to see this sort of growth mirrored within the field of commercial heat pumps if high temperature CO2 units became available?

We may be about to find out as Green Thermal Energy is in the final stages of launching a range of commercial CO2 heat pumps.

Aiming for third quarter 2016, Green Thermal Energy has air and ground source units that will provide flow temperatures up to 80°C.

Garry Broadbent of Green Thermal Energy commented: "The range of equipment we are about to launch will function in both heating and hot water modes."

He added: "This range will provide the specifier with a high temperature heat pump operating with a natural refrigerant that is suitable for both retrofit and new-build applications."

Watch this space for more details, as we may be on the verge of witnessing one of the more exciting developments within the heat pump sector.

Green Thermal Energy's objective of increasing the ease of heat pump application whilst maintaining highly efficient operation would certainly be a positive step forward.

District heating and cooling networks in the UK

Gordon Moran, writing for the European Energy Centre (EEC), explores the opportunities available for the UK renewable energy industry to tap into cooling networks and district heating technologies

Around 40% of energy use globally is by buildings, primarily for heating and cooling. Emissions can be lowered by adopting more efficient types of systems for these purposes, as well as switching to low carbon energy sources. District heating and cooling networks are two such technologies; these are systems for distributing heat generated in a centralised location, or chilled water for cooling purposes across a network. Both systems provide a more efficient method than localised boilers or cooling systems.

District heating has a wider range of applications in a cool temperate country such as the UK. However, there is potential for growth in markets for both technologies due to the scope of the efficiency gains that they provide. District heating is more established with grants available for its installation, and interest from councils and housing associations to reduce energy bills. There is less familiarity with district cooling in the UK, though this could partly be mitigated by integrated systems where district cooling is provided as part of a district heating network.

Recent new technological innovations may help build the case for deploying them on a wider scale. For example, a new district heating technology developed in Norway is able to generate usable heat from 8°C water. There is great scope for using this technology in the UK; the River Thames alone has capacity to provide heat for 500,000 homes. It has also been calculated that using water from abandoned coal mines could supply up to 40% of the heating demand for Glasgow's buildings. Such innovations, combined with campaigning to improve political support for the technologies and using good business acumen to identify opportunities in existing markets, could see both technologies making a substantial difference to lowering UK carbon emissions and improving levels of energy efficiency.

To learn more about renewable energy and energy efficiency related training courses, visit www.EUenergycentre.org

CURRENT AFFAIRS

Bill Wright, Head of Energy Solutions at the ECA, looks at the advantages of energy storage and how the UK can take the lead.

Renewable energy is becoming more popular – on the other side of the Atlantic at least. Apple has found a way to draw 93 per cent of their energy from renewable energy sources, and their latest centre in Nevada is fed from solar arrays – welcome news at a difficult time for the renewables industry.

Hopefully this will set a precedent as, where Apple goes, others tend to follow. Companies who follow their example and aim towards 100 per cent renewable energy sources can boost their "green" credentials and enjoy a degree of energy security - as long as the system has been configured to run 'off grid'.

Despite the lack of sunshine in the UK we should be looking for companies to do something similar by owning and operating their own renewable supply sources. The Co-oP Group has made inroads in this area by building wind farms on their land. Although these are not directly connected to their buildings, they will give them some degree of contractual independence from the main energy providers.

Of course, one issue this raises is what to do when there is little wind – and, in the case of PV, what to do overnight. This is where energy storage comes in. Tesla have given a tremendous marketing boost to electricity storage systems in recent years – even though they have very few systems in the UK – and this year could the year it finally takes off at a building and even at grid level.

Energy storage is an area where the UK could apply real leadership and actively encourage firms to take it up – and the seeds might have been sown with the Chancellor's pledge to allocate £50M to innovation in the storage and associated areas in his Budget last month. Let's grab this opportunity and use storage to encourage further take up of renewable energy – we don't know how many more of these chances will come our way!

New Certification Scheme – assuring quality

The BRE National Solar Centre joins up with BRE Global to launch a new certification scheme. **Steve Pester**, BRE explains.

The market activity for new solar systems has inevitably slowed down considerably following the severe cuts and caps to government support mechanisms. However, that does not mean there is no activity. It is well known that there has been a buoyant resale market for solar farms for some years, but more recently, there have been signs that rooftop PV systems are also being traded – this is known as a 'secondary market'.

However, the deadlines imposed for changes to FiTs and ROCs caused a large number of systems to be installed very quickly – the STA tells us that there were 60MW of PV FiT applications under the new regime in Q1. Inevitably, this kind of rush to beat the deadlines can result in quality taking a back seat, at least for some installation companies and their subcontractors.

So, how does a buyer in the secondary market ensure that systems they are considering are safe, reliable and will perform as expected? Similarly, how can a seller demonstrate that their PV systems are up-to-scratch? If the system has at least 12 months of generation figures, that certainly helps, but they provide no assurance as to the longevity and quality of an installation.

To help provide this assurance, the BRE National Solar Centre has linked up with BRE Global (a recognised certification body) to launch a new certification scheme for individual PV installations. The scheme is aimed at systems over 50kW and uses the recently published Code of Practice for Grid Connected Solar Photovoltaic Systems as the core technical reference. It is expected that the scheme will be of interest to installers wishing to gain market differentiation, system owners, buyers and financiers. If you would like to know more about the scheme, come along to our solar conference in July (details on the NSC website), or contact us directly (steve.pester@bre.co.uk or nsc@bre.co.uk).

The battery storage bandwagon

Widely bandied as energy efficiency's secret weapon, battery storage technologies seem to the hot topic of the moment. However, the reality is that there is still much work to be done before achieving mass-scale adoption, mainly when it comes to equipping installers with the training and support needed in order to diversify into this sector. Here, **Steve Everard** at Rexel UK advises

As we all know, tackling climate change by reducing energy demand and our global dependence on fossil fuels remains top of the public agenda.

And although much focus, when it comes to energy strategy, has previously remained on the use of renewables, recent years have seen the emergence of what has been widely coined the 'holy grail of energy efficiency' – battery storage.

Battery storage, in effect, enables users to maximise self-consumption generated by renewable technologies, such as solar PV, windfarms and the like, by storing away any excess energy that can then be used as and when needed.

Although not a new concept, battery energy storage is quickly gathering momentum, thanks to rapidly evolving technologies and falling costs.

According to a report by the Renewable Energy Agency (REA) and consultancy KPMG, the cost of battery storage technology has fallen at such a rate that within two years it will be cheap enough for households with existing rooftop solar systems.

According to recent research run in conjunction with the Carbon Trust, energy storage could in fact deliver savings of up to £50 a year on an average consumer energy bill, and a system-wide saving of up to £2.4 billion a year, by 2030. Beyind that, the report also indicates that energy storage adoption offers the 'least-cost pathway' for the UK to meet CO2 reduction targets.

Looking at the broader picture, with the power system diversifying at grid level, utilities are increasing seeing how storage can be dropped into strategic places in the power system in order to de-stress the rest of the grid, thus providing new reliability options and the opportunity to avoid investment in generation.

Collectively this, in turn, places a huge opportunity in the solar realm. After all, there is evidence to prove that solar PV, in particular, offers the highest potential when using on a solar installation; solar PV installed alongside storage battery could increase a systems self-consumption capabilities to 70%, and reduce the amount of energy sent back to the grid by 50%.

Once the market has matured, it will undoubtedly allow building owners to take control of their solar energy use, reducing the impact of fluctuations in the cost of energy and lessening reliance on the grid. There are, of course, also wider environmental benefits, such as reducing fossil fuel dependence and the carbon savings.

Importantly, it's not just existing solar installations that can generate these benefits.

The typical cost for a new solar PV system has decreased by more than 50% in the last three years, making the payback periods even more inviting for building owners who choose to incorporate energy storage as part of the installation.

Battery storage is already well established in some European countries, such as Germany, so it's essential for the industry to look to these early adopters to identify successes and challenges for implementation.

In the German domestic market for example, figures show that over 30,000 battery storage units were supplied in a period of just two and a half years, with the market growing by around 35% since 2010. Although some of this growth can be attributed to the programme of funding for battery storage implementation, from the KfW, government-owned German bank.

One observation from the success Germany has had in the residential sector is that lithium-ion batteries have been used in 90% of battery storage installations, incorporating the already proven technology that's widely used in electronic devices such as laptops and mobile devices. Lithium-ion battery storage products are much more efficient, with a longer expected life time than lead acid counterparts. They are also better placed to discharge higher levels of stored energy – an important factor for the UK commercial market.

There are other challenges closer to home, however, such as complications when combining technology in both new and existing systems. Recent research by Innovate UK indicates that commercial buildings in the UK are producing an average of 3.8 times more carbon than estimated at their design stage. Much of this, according to the government-appointed body, can be attributed to the technology not being correctly integrated when installed and commissioned.

When selecting a battery storage system, it's important to look at estimated daily energy consumption (kWh), peak load time for the building, how much solar PV can be or is already installed and the anticipated generation of the system. This means specifiers can then calculate the correct battery capacity and whether a single or 3-phase supply set up is more appropriate. Space and location must also considered as these factors can impact on the way the battery packs are installed, ie. is there easy access for both installation and maintenance, and are there any safety implications?

Another obstacle is that there are currently no regulations for battery storage in the UK. However, the IET (Institution of Engineering & Technology) is in the process of developing Codes of Practice for contractors – a move that Rexel UK strongly advocates, as it is vital for the industry to quickly establish best practice and a common language for the market as early on as possible.

As the new energy world emerges, the onus on tackling climate change and reducing our reliance on the grid is only going to grow. Battery storage has a vital role to play in this; effectively transforming the way the world uses energy. However, before jumping on the battery storage bandwagon, it is vital for contractors to get trained up and do their research to ensure they are best placed to unleash the full potential this exceptional innovation has to offer.

Round-up of all the latest green gadgets and innovation to hit the market

ProductNews

SolarMax Group

MaxStorage TP-S

The SolarMax Group is launching its new storage solution MaxStorage TP-S. The new system has a modular construction, uniting lithium-ion battery storage, a battery management system, a tried-and-tested SolarMax TP-Series inverter and the new MaxWeb XPN energy manager, all within one casing.

When it comes to the inverters, customers can choose between three possible TP-Series devices with rated outputs of five to seven kilowatts. Thanks to their dynamic 70% power reduction they can control consumers to increase self-consumption. The basic storage module has a capacity of 3.6kWh and can then be extended in increments of 1.2kWh up to a total of 12. The DC-coupled system achieves a charging efficiency factor of 97%, and can be discharged in a wide operating range of -20 to 60 degrees Celsius.

For managing energy, the SolarMax Group has developed the new MaxWeb XPN data logger. As the nodal point for remote monitoring it records current readings, yield data and events. As an energy management centre it regulates the energy flow and adjusts it to suit energy need and availability. This makes it possible to use existing resources intelligently.

All used and surrendered power is visualised, and both own consumption and electricity saved are graphically represented. The MaxWeb XPN software is self-learning: based on typical consumption and the weather forecast the data logger determines the best time to store solar power, which increases efficiency and maximises returns.

The starter model for the single family home range TP-S is available as of the final quarter of 2016. An extension for larger capacity ranges with the MT-S and HT-S models is planned. The group grants a 10-year system guarantee for all storage system solutions.

As well as the storage system solution, the group is presenting its high-performance RX-Series central inverter for the first time. SolarMax has developed both outdoor inverters with rated capacities of 500 and 600 kilowatts for large-scale international projects. They will be on the market by the end of the year.

Herz

Poultry biomass boiler

Leading UK biomass technology supplier Myriad Heat and Power has launched an innovative Herz biomass boiler, which can be fuelled entirely by poultry litter.

The new Herz 995kW industrial boiler has been designed specifically for the poultry industry. It is fully compliant with strict Animal Plant & Health Agency requirements and features hard-wearing Hardox and stainless steel components to cope with the corrosive and abrasive nature of the fuel.

Not only does burning poultry litter provide a self-sufficient heating solution, protecting users from rising fuel costs, but it also offers an additional revenue stream through RHI payments as well as potential fertiliser sales from the ash created. In addition, the birds' welfare and crop performance is improved through the removal of moisture and CO2 in the sheds – both given off by traditional LPG burners.

The Herz poultry boiler has been designed to offer maximum durability and efficiency, with a chamotte lined combustion chamber to provide a steady temperature, a vertical heat exchanger to prevent dust build-up and a grate with three different combustion zones for more accurate control and improved emissions. It is also equipped with a full remote monitoring system and combustion chamber camera for total control and intelligent maintenance.

Aura Light

Indico LED street light

Aura Light has taken a step into the future with its new Indico LED road and street light luminaire. This innovative street lighting scheme boasts a stylish, contemporary design incorporating intelligent features.

Launched last year by Aura Light UK's parent company in Sweden, the Indico luminaire is now available in the UK and across Europe. It comes in 35W, 60W, 90W and 120W options for a low-energy LED solution to replace less efficient HPS street lamps.

Aura Light has designed Indico for ease-of-use combined with exceptional energy savings, providing the ultimate solution for local authorities, architects and specifiers. The luminaire can be opened without tools using a small, discreet hatch on the side of the body that will automatically lock into position to aid maintenance. This feature is supported by an automatic switch-off function, activated when the body is opened to eliminate safety risks.

The LEDs are incorporated using a modular design, meaning these, as well as the LED driver, can easily be replaced and upgraded.

Indico also offers variation within a scheme with a 15° adjustable bracket to change light distribution as required.

Drummond

Fused G Clamp

A new range of insulated Drummond G clamps, designed to provide safe and easy connection to bus bars for voltage measurement, is now available.

The moulded G clamps, which eliminate the need to drill the bus bar, provide installers with a safe and reliable connection, via a standard 4mm socket.

Ideal for connecting power monitoring and measuring equipment, the clamps are clearly colour coded in black, brown and grey to match the colour coding of individual phases in 3-phase systems. All 3-phase colours are also available with a replaceable 0.5A fuse in the clamping screw, providing protection at the source for added safety and peace of mind. Other fuse ratings can be specified as required.

Housed in insulated casing to enhance safety, the new range of G Clamps also features a spring loaded contact pin and locking ring to ensure reliable results throughout extended logging periods.

Featuring a fluted grip design, which enables the clamping screw and the locking ring nut to be tightened by hand, whilst wearing PPE insulated gloves, the need to use tools within the bus bar chamber is therefore eliminated, further heightening safety whilst avoiding unnecessary shutdowns.

Hitachi Power Tools

UC18YSL3 battery charger

Hitachi Power Tools has launched its superfast UC18YSL3 18V battery charger, which can fully charge a powerful 6.0Ah lithium-ion battery in 38 minutes. This means that by taking two 6.0Ah batteries on site, one for use on an 18V power tool and one being charged by the UC18YSL3 on rotation, a tradesperson will never be without cordless battery power.

The UC18YSL3 charger is compatible with all Hitachi slide Li-ion batteries, including 1.5Ah (15mins), 2.0Ah (20mins), 3.0Ah (20mins), 4.0Ah (26mins), 5.0Ah (32mins) and 6.0Ah (38mins).

Hitachi has included a USB port so the all-important mobile phone can be charged at the same time, and the UC18YSL3 is compatible with engine generators too.

SegenSolar

Tesvolt

German wholesaler SegenSolar has joined forces with manufacturer Tesvolt for commercial storage systems of 30kWh and above. SegenSolar, an affiliate of the UK's largest photovoltaic wholesaler, Segen Ltd, is now supplying Tesvolt's lithium energy storage systems via its online portal and from several distribution branches around the world. SegenSolar additionally offers support to installers during the planning stages.

Tesvolt has developed storage systems using prismatic battery cells. The cells' special design and chemical composition makes for the high charging speeds achieved by Tesvolt storage systems. The intelligent control system ensures that each individual cell is charged and discharged at the optimal rate for a particularly long service life. Tesvolt storage systems, which come in six size categories from 10 to 120kWh, reach up to 8,000 full charge cycles at 70% depth of discharge (DoD) and come with a 10-year performance warranty.

Refresh yourself this summer

As temperatures rise across the country for the next few months, installers typically find themselves with more free time on their hands. So, why not use this period to brush up on your skills, says HETAS, the official body for approving biomass and solid fuel appliances, fuels and services...

The warmer months are an ideal time to book in some refresher training courses, says HETAS CEO Bruce Allen. "The renewal of qualifications is crucial, and is mandatory for combustion appliance installations under Competent Person Scheme rules. Refresher courses cover all updates in Regulations and Standards whilst giving installers the opportunity to demonstrate their existing knowledge and ability, ensuring they are able to give the best possible service to customers."

Installers can now sit their HETAS Refresher assessment up to six months ahead of the due date. "Rather than wait for previous qualifications to expire, we are encouraging our registrants to sit the courses in advance. We want to give installers every opportunity to have training on dates that are convenient to them and ensure they are covered by the CPS all year round," Allen adds. Under HETAS's scheme, installers will not lose any time from their five-year extension. For example:

H003 dry installer course passed:
13th January 2012
Refresher due:
13th January 2017
H003 refresher passed:
9th September 2016
Qualification valid until:
13th January 2022 (5 years and 4 months from the assessment)

Installers can also use this time to enhance their skills set with a new course such as the Internal System Chimney course (H006) and the new, increasingly popular, Dry Pellet Stove course (H008). "This is a great opportunity for installers to boost their business by offering customers a wider range of installations," says Allen.

HETAS registrants continue to benefit from expert advice on the Technical Helpline as well as Regular Technical Bulletins and E-News, which can now be accessed in the new Installer log-in area of the HETAS website. The portal also contains useful information and tips and is updated on a regular basis.

For more information on refresher courses, contact your local HETAS training centre or visit the HETAS website for details on available dates: www.hetas.co.uk

Eneco UK & Co-operative Energy announce strategic partnership

Eneco UK & Co-operative Energy have revealed details of a strategic partnership and the launch of a new energy product – Highlands & Mearns Wind – which offers householders surrounding both Tullo & Twinshiels, Lochluichart and Moy wind farms in Scotland access to 100% renewable electricity supplied by the Eneco-owned wind farms.

The competitively priced green energy tariff will be offered to local householders who sign up to Co-operative Energy on either a dual fuel or electricity-only 12-month contract. It is anticiated that the exclusive Highlands & Mearns Wind tariff will be welcomed by local communities that have already gained from a generous community benefit scheme.

Marketing for Highlands & Mearns Wind will now be rolled out over the coming weeks with energy roadshows planned for both communities.

Many homes are eligible for the exclusive Highlands & Mearns Wind tariff with customers becoming members of The Midcounties Co-operative and benefiting from a Share of Profits that can be redeemed against their energy account.

New golden age of steam beckons following funding boost

Groundbreaking Scottish manufacturer Heliex Power has solved an energy problem that has stumped academic and engineering minds for centuries by devising an efficient way of harnessing the power of 'wet' steam.

A team of engineers has developed patented technology to recover energy from a ubiquitous yet largely untapped energy source – the type of vapour you can see when a kettle boils. Produced at low temperatures and low pressure, wet steam has to date been lost as waste heat in millions of factories across the globe because its moisture content caused irreparable damage to turbines.

Developed in conjunction with researchers at City University, London, Heliex's technology uses screw compressors, working in reverse, to recapture lost energy and generate electricity in an economically viable way.

The company recently received a £4.2 million funding injection, taking the total investment to date to £16 million and helping it exploit an untapped market worth billions worldwide.

Dan Wright MBE, founder of Heliex Power, said: "It's the Holy Grail of energy recovery for manufacturers and it's hugely environmentally friendly. The wet steam conundrum has been an enduring problem in the industry for many years and we have 100% proven that our answer to it works, with massive cost and energy savings. When we show engineers what we've achieved they say: 'At last! Someone's finally done it.'"

More than 40,000GWh of energy is lost globally every year through waste steam and it's estimated that up to 50% of industrial energy usage is eventually released as waste heat – enough to power 28 billion homes. The potential market for the system is in excess of £70 billion.

The technology traditionally used to harness the power from steam only works effectively with superheated steam – that's steam in a higher temperature range than wet steam, which typically costs more to produce.

Heliex Power has already secured a range of contracts from across the world, with half of its systems sold to international buyers. More than 20% of Heliex's sales have been in Italy, while the company has also had success in India, The Netherlands, France and Poland. Its systems can recover energy from a variety of heat sources making it relevant to a vast array of industries, ranging from food and drink manufacturing and glass production to chemical engineering, waste incineration and agriculture.

To help the company continue its global roll-out of the technology, Heliex has secured a further £4.2 million of funding from existing shareholders BP Ventures and Greencoat Capital, while also taking on its first financial support from Scottish Enterprise's investment arm, the Scottish Investment Bank, through the Scottish Venture Fund.

The company's turnover breached £3 million this year and on the back of the funding deal, Heliex Power is aiming to double turnover next year to £6.5 million, and again to £13 million the year after.

Chris Armitage, Chief Executive of Heliex Power, said: "Sales are growing rapidly and this investment will enable us to accelerate the expansion of the business, bringing our proven technology to new sectors and geographies. The funding will also allow us to continue innovating, with a number of new products in the pipeline."

Sell-out success for UK's first council solar bonds

The UK's first ever council solar bonds, issued by Abundance and Swindon Borough Council, have sold out a month early, setting a benchmark in innovation for local authorities to fund renewables and other infrastructure projects.

Swindon Community Solar Farm is the UK's first to be funded jointly by a borough council with bonds sold directly to members of the public. The bond offer, structured by leading peer-to-peer investment platform Abundance, opened in February and closed at the end of May, a month earlier than scheduled, after reaching its £1.8 million target. Swindon Borough council is co-investing £3 million to build the 5MW solar farm on council-owned land at Common Farm, Wroughton, near Swindon.

Bruce Davis, Managing Director, Abundance, said: "The success of this investment offer has really set a standard for local authorities looking to fund green infrastructure. We've had lots of inquiries from other councils interested in following Swindon's pioneering lead. Energy is one area where local authorities have the power to make a difference, engaging and enabling their residents to take positive action. We'd also like to see them going beyond solar to fund other infrastructure projects this way."

The investment was structured to be open to anyone with a minimum of just £5 and offered an effective rate of return of 6% over its 20-year term. During the three-month offer period it attracted an average of £18,000 in investment per day with one-third coming from the Swindon area.

Councillor Dale Heenan, Swindon Borough Council Cabinet Member for Transport and Sustainability, said: "We took a bold decision to create this community solar farm by offering the first council bond direct to the general public in over 100 years. It was a calculated risk to raise £1.8 million this way, but we knew there was an appetite from residents to invest in something with genuine environmental and community benefits.

"All councils need to find new and innovative ways to fund the vital work that they do for their communities, and Swindon now has a template which other local authorities can follow. Embracing renewables will help Swindon Borough Council raise £1 million more in business rates and rent by 2020, which means £1 million more every year which can be spent on important local services."

Construction has already started and the solar farm is due to be completed by the end of June.

Renewable boost for South African community charity

The Magic Thermodynamic Box Company has donated a Little Magic Thermodynamic System to South African charity The Sozo Foundation, which has constructed its first ever education centre in the Vrygrond community near Cape Town.

The Sozo Foundation was founded in 2011 by Anton and Elana Cuyler to address the problems of hunger, homelessness and poor educational attainment by local youngsters. The citizens of Vrygrond face daily challenges from gangs, crime and drug abuse. Sozo has raised over £150,000 to fund the new youth education centre, which is designed to create a conducive learning environment.

The Little Magic Thermodynamic Box (LMTB) was installed in the charity education centre to generate up to 100% of their hot water. Best described as working like 'a fridge in reverse', most people understand that the panel on the back of their fridge is a factor in keeping its contents cold. Reversing this principle by using a thermodynamic aluminium collector (panel 800mm wide x 1700mm high) mounted to the outside of the centre to absorb rather than reject heat, allows the charity to utilise the ambient air temperature day and night in all weather conditions to change the refrigerant liquid circulating through the panel from a liquid to a gas form. This changing of state of the refrigerant allows energy to be captured from the ambient air and passed in a proprietary way into stored water to heat it.

The LMTB has been installed across thousands of domestic and small commercial properties over the past four years and is now enabling the Sozo Foundation to offer students and staff an opportunity to generate their own hot water at all times of day.

Anton Cuyler, manager of the education centre, said: "The donation of the Little Magic Thermodynamic Box is significant for the Sozo Foundation, as it will greatly impact the services we can offer the learners who attend our education programme on a daily basis.

"We currently feed 60 learners 10,000 meals a year, which requires hot water to be able to wash dishes hygienically. The sustainability of the organisation is also increased due to the reduction in energy consumption and reliance on electricity. Thank you Magic Thermodynamic Box Company for changing the future of the Sozo Foundation!"

Later this year the company will be returning to South Africa to gain an understanding of how the foundation has moved forward with the LMTB installed.

Can consumers help to accommodate more renewable energy?

Renewables generation is being rolled out across Europe at unprecedented rates as the shift to green energy gathers momentum. But what happens when the wind isn't blowing and the sun isn't shining? Sim4Blocks, a project funded by the EC's Horizon 2020 programme, is aiming to increase the flexibility of the grid to accommodate the unpredictable nature of renewables by testing out innovative systems for demand response – when consumers adjust electricity use to match what is available.

The Renewable Energy Directive requires the EU to fulfil at least 20% of its total energy needs with renewables by 2020. However, this doesn't just entail the building of wind and solar farms. The unpredictable output that comes from solar and wind energy means that the electricity ecosystem needs to become more flexible.

Why is flexibility needed?

Electricity grids must always maintain a stable frequency (50Hz in Europe), which is done by matching the supply and demand. This used to be a simple task when electricity was produced from sources such as fossil fuels and nuclear power, as output could be easily controlled to meet demand levels.

However, recent years have seen renewable energy become an increasingly large component in the power supply, and the intermittent nature of renewable energy sources makes it more difficult to maintain a stable frequency. In worst-case scenarios this can lead to power outages or having to wastefully shut down generation from renewables.

Demand response – use power when the wind is blowing

This decreased ability to regulate the frequency of the grid from the supply side means new methods are needed. One way of doing this is to create systems that encourage consumers to match their demand with supply rather than matching supply with demand. This is known as demand response and typically involves shifting electricity use from times with little renewable electricity production in the grid to times when there is more, ie. use power when the wind is blowing. Consumers thus play a more active role in the operation of the electricity grid.

Demand response reduces the need to temporarily shut down generation from renewable sources and complements the capacity of peak load power plants, used to meet demand during peak hours.

The Sim4Blocks project

Sim4Blocks is a four-year project that will develop innovative demand response services for residential and commercial applications. The project will combine decentralised energy management technology at the blocks-of-buildings scale to enable demand response. The project, with a consortium of 17 partners across Europe, began on 1 April 2016.

The demand response systems and services will be applied to three pilot sites in Germany, Spain and Switzerland, and tested together with interfaces to ensure they are intuitive to use.

Clarifying the VAT issue on energy-saving products

A reduced rate of VAT (5%) is applied when certain energy-saving products are installed in homes. An MCS contractor will charge the reduced rate on the installation and any extra work that's part of it.

Not all products qualify for the reduced rate and they can't be installed independently.

Energy products that qualify

The reduced rate of 5% is paid for:

- Controls for central heating and hot water systems
- Draught insulation, eg. around windows and doors
- Insulation on walls, floors, ceilings, lofts, etc
- Solar panels
- Wind turbines
- Water turbines
- Ground-source heat pumps
- Air-source heat pumps
- Micro combined heat and power units
- Wood-fuelled boilers
- Central heating systems

The reduced rate of 5% for work funded through energy efficiency grants is paid on the:

- Installation of heating appliances
- Installation, repair and maintenance of central heating systems
- Installation, repair and maintenance of renewable source heating systems

The reduced rate is only for the grant-funded part of the work. To qualify, the customer must be over 60 or getting one or more of the following:

- Child Tax Credit (but not the family element)
- Council Tax Benefit
- Disability Living Allowance
- Personal Independence Payment
- A disablement pension
- Housing Benefit
- Jobseeker's Allowance (income-based)
- Income Support
- War Disablement Pension
- Working Tax Credit

Energy products that don't qualify

The standard rate of VAT applies for:

- Heating appliances or systems – unless an energy efficiency grant is available
- Energy efficient boilers
- Secondary or double glazing
- Low emission glass
- Energy efficient fridge freezers

It takes two: Credentials for a perfect partnership

For over half a decade Waxman Energy and Phono Solar have been working together to offer high quality, efficient and cost-effective solar PV panels to UK customers. Phono Solar was one of Waxman Energy's first PV manufacturer partners, giving the two companies a strong history that has helped strengthen their relationship and further build both companies' impetus throughout the UK.

Since establishing this partnership, Waxman Energy has delivered a number of high-profile residential and commercial projects across the UK while Phono Solar has become one of the most recognisable and trusted PV manufacturers, with its brand reputation gaining more awareness year on year.

Founded by SUMEC Group, Phono Solar Technology Co, Ltd has been developing PV modules and renewable technologies for the past 10 years. In 2014 SUMEC's profile was considerably raised after it hit a record high from international trade, reaching $4.57 billion from imports and exports throughout the group. In 2015, this number steadily increased to $4.65 billion, reflecting SUMEC's stability in the market.

Combine this with the Global Fortune 500 status of SUMEC's parent company Sinomach and it offers great confidence that the products Phono Solar produces are built to high standards of quality and innovation.

These factors have helped Phono Solar to become accomplished in its own right. Recognised as a Tier 1 manufacturer on the Bloomberg BNEF since 2014, the company is able to differentiate itself thanks to the bankability and stability afforded by its parent companies. Now one of the leading PV energy companies in the industry, Phono Solar is dedicated to the growth and commitment of renewable energy production, as well as research and development.

Such accolades give Waxman Energy confidence to further commit and continue its partnership with Phono Solar, which paves the way for a mutually rewarding relationship. Combining Phono Solar's Tier 1 credentials with Waxman's 50-year distribution experience, accumulated by parent company Waxman Group, the two companies offer the perfect blend of credibility and reliability. This helps to provide a trustworthy supply chain that customers can count on.

Mariana Hall, Vice President of Phono Solar, said: "We are very excited about our continued partnership with Waxman Energy, one of the most experienced and dynamic distributors of renewable energy products in the UK. Together, we can continue to bring new and exciting solutions to PV installers, competitively positioned in this challenging and evolving market."

Richard Waxman, Chairman of Waxman Energy, added: "Trust is one of the key factors today in trading solar PV. Waxman Energy's partnership with Phono Solar highlights the key principles we endeavour to uphold as they are a company we can trust, they develop products we can trust and we deal with people we can trust. These factors are particularly important given the difficult solar climate currently prevailing in the UK, where reliability and bankability are the driving forces for future success."

Germany agrees deal to put the brakes on renewables

German chancellor Angela Merkel has thrashed out a deal with the country's state premiers on the latest reform to Germany's renewable energy law, aimed at curbing the costs and controlling the speed of the roll-out of green power sources.

After a through-the-night meeting last month with the leaders of Germany's 16 states, the Government has agreed to cap the expansion of onshore wind power at 2.8GW in capacity per year.

In addition, only a certain amount of new capacity will be permitted in north Germany to avoid overburdening the electricity grid.

Generous green subsidies have led to a boom in renewable energy sectors such as wind and solar power. But the rapid expansion has pushed up electricity costs in Europe's biggest economy and placed a strain on its grid.

The latest reforms are aimed at slowing the growth in renewables, which accounted for around a third of Germany's electricity last year, up from 28% in 2014.

With the Government sticking to its target for an increase in the share of renewable sources to 40-45% of total electricity production by 2025, it will have to put the brakes on growth to avoid overshooting.

One of the biggest sticking points in the talks was a plan to limit the amount of onshore wind, with critics saying this would endanger Germany's long-term energy goals and put jobs in the sector at risk.

The Government and states failed to agree on upper limits for biomass, which is important in the southern state of Bavaria. But Merkel said she expected to be able to clear up this point.

The draft law is due to come into force at the start of 2017.

College reinvests in biomass

The Edward James Foundation has invested in a new state-of-the-art biomass (wood fuelled) boiler at the West Dean Estate. After 35 years of constant use the old boiler, which heats the internationally renowned West Dean College and student accommodation, the Victorian glasshouses in the award-winning gardens and a number of the properties on the 6,400-acre estate in West Sussex, has been replaced.

The first biomass boiler was installed in 1981 when the trustees were faced with replacing an old boiler and decided to make use of the estate's own renewable source of energy from its forestry operations. All wood used for the biomass is produced on the estate and largely consists of softwood thinnings of Douglas Fir, European Larch, Norway Spruce and Corsican Pine, amongst other varieties.

The new and extended district heat network is powered by a Froling boiler and will receive a subsidy for each kWh of heat produced under the Renewable Heat Incentive (RHI). In addition to heating the properties served by the old system the new system will allow a further 22 residential properties on the off-gas estate to be added, with no increase in the amount of wood required.

"West Dean Estate has been committed to heating self-sufficiency for the past 35 years and we are proud to have made this long-term investment in the latest biomass technology," says Alex Barron, Chief Executive of The Edward James Foundation. "The new high-tech boiler system will be much more efficient so, for the same annual fuel requirement, we have been able to extend the heating system to a greater number of tenanted properties in West Dean village in addition to the main buildings across West Dean College and Gardens."

The work has been carried out over the winter months to minimise disruption to the college, garden visitors and local community. Contractors laid 1,500 metres of piping from the boiler's new location, opposite the entrance to the college,

to serve the new district network. The new district heat centre incorporates a larger chip store, which streamlines the production process; enough to run the boiler for two months in the winter or six months in the summer. This will allow for tight control of the moisture content of the feed stock, resulting in greater operating efficiencies with a minimal wastage of around 1% ash. The new high-tech system incorporates two oil boilers which will top up the heat produced in extreme low temperatures as well as provide back up in case of any maintenance.

The whey to go for turning dairy waste to energy

Faced with an anaerobic digestion (AD) plant not operating effectively, Dr Stephen Temple – a Norfolk-based dairy farmer and co-owner of Mrs Temple's Cheeses – enlisted the help of CooperOstlund to advise on a new engine solution to turn unwanted waste into renewable energy. Installed and commissioned in less than 48 hours, the 140kW system now generates more than £220,000 revenue for the farm every year.

As part of a diversification venture for their 230-hectare dairy farm, Dr Temple and his wife Catherine made the decision to launch a luxury cheese brand. From Bingham Blue and Walshingham, to Mozzarella and Wighton, Mrs Temple's Cheeses is now renowned nationwide as one of the UK's finest artisan producers.

With sales increasing every year, cheese production has quickly become a key source of revenue. However, with a large volume of whey generated during production, combined with cow slurry, fodder beet and maize silage from the farm's wider operations, waste volumes and disposal costs have also continued to escalate.

Dr Temple decided to invest in an on-site AD facility, which would turn this waste into methane gas via the natural degradation of organic waste. Using a CHP engine, this gas could be turned into renewable energy and used to power the farm – driving down both energy and waste management costs.

Getting it right from the outset was important, but the project didn't run as

smoothly as expected. The AD plant wasn't operating effectively, which saw energy production and return on investment figures drop. After researching specialist CHP advisors, Dr Temple came across CooperOstlund – the UK's leading gas engine specification and maintenance expert – who reviewed the site and advised on a more effective solution.

Taking waste volumes, feedstock type and energy requirements into close consideration, CooperOstlund removed the existing biogas engine – replacing it with a considerably more efficient alternative.

The new CHP engine produces 170kW electrical and 198kW thermal energy to heat the dairy, farmhouse and other buildings, as well as warm the cows' drinking water and power the grain dryer. Excess power is exported directly to the National Grid and, thanks to government subsidies, delivers a financial return of more than £220,000 per year. The CooperOstlund team provides ongoing servicing and maintenance to keep Dr Temple's CHP engine running throughout the day and night.

In a short space of time, the AD operation has transformed. Dr Temple has completely eliminated organic waste, while becoming self-sufficient in terms of energy overheads. He was recently voted Farmers' Weekly Green Energy Farmer of the Year, and is now looking towards additional processes to minimise his environmental impact.

Community-scale heat pump for social housing estates

Large heat pumps are expected to play a key role in meeting government heating decarbonisation targets, according to partners involved in the development of the UK's largest air source heatpump for residential use.

An industrial-size air source heat pump capable of delivering affordable, low carbon heating and hot water for vulnerable households across Scotland's existing housing estates, was described as a completely new concept of district heating.

"We're looking to gain fuel poverty alleviation for Hillpark Drive, a 350-home social housing estate built in the 1970s, currently fitted with electric storage heating, to build a more sustainable community. Heat pumps weren't even a factor at the inception of this project as we had never thought it would be possible to work with heat pumps on this scale. GHA has only worked with small, individual heatpumps which we found to be unsuccessful. However, this is a different beast," said Colin Reid, Energy & Sustainability Manager at the Glasgow Housing Association (GHA), part of the Wheatley Group.

Developed by a joint partnership between the GHA, energy consultants WSP Parsons Brinckerhoff, heat pump manufacturers Star Renewable Energy and Scottish Gas, the new renewable heating technology is expected to become the pathway to zero carbon, cheap heat for existing social housing stock.

The 400kWh air source heat pump is designed to be installed at an energy centre and connected to a centralised district heating network, which will deliver low carbon heat to six buildings plugged into the scheme. At eight metres long and 10,000 kilograms in weight, the air source heat pump incorporates in-built control systems to enable remote monitoring and ensure optimum efficiency throughout its lifecycle, an expected 20-plus years. With the use of the robust industrial manufacturing components, higher water temperatures of 60°C are achieved, allowing for regular radiators to be used.

Air source heat pumps are perfect for the UK's mild climate as warmth is extracted from the outside air and then boosted up for distribution via a 'wet' central heating system to the whole housing community. This will be the first time an air source heat pump installation in Britain will provide central renewable heating for a block of high-rise buildings.

"Many people believe that renewable energy is solely for modern buildings, however our new development demonstrates that this is most certainly not the case. In the UK, 99% of our properties already exist. If the Government's ambitious targets for a complete cessation of fossil fuels for heating is to be realised, we need sustainable and lower cost central community heat pumps capable of retrofit without the constraints and high infrastructure costs associated with other renewable technologies," said Dave Pearson, Director of Glasgow-based Star Renewable Energy.

Ewan Jures, Principal Engineer at WSP Parsons Brinckerhoff, gave details of the different options and factors affecting deployment of other low carbon technologies in the Hillpark Drive project, adding that they could not be deployed as "cost-effectively and rapidly" as the community air source heat pump.

"Biomass suffers from access for deliveries, air quality concerns and flue stacks; combined heat and power was off gas grid and has low grid export prices, ground source heat pumps were not an option in this situation as there was a lack of available and suitable grounding in the area; water source heat pumps were not suitable here as there was no nearby body of water," he explained.

Transformer technology generates benefits for food waste energy converter

A company that operates an anaerobic digester to convert food waste into renewable energy has specified the latest in EU Ecodesign compliant transformer technology to boost power capacity.

Local Generation Ltd has installed a new 2.5MVA ecopower Tier I compliant HV distribution transformer from Slaters Electricals at its facility in March, Cambridgeshire, which is the first of several sites planned to come on stream to provide sustainable energy for the UK.

The anaerobic digester produces 'clean' biogas from thousands of tonnes of locally supplied food waste to power a 1.2MW generator set, which in turn produces electricity for the site's needs with additional capacity sold to the National Grid.

This has led to the necessity for a new Ecodesign compliant transformer to handle the huge step up in voltage from 433V to the 11,000V the Grid requires.

Installation of the new transformer was completed within just eight weeks of the initial order and has enabled Local Generation to also secure a reliable power supply, with the additional benefit of helping to improve the efficiency of the digester in the process.

HEAT PUMP

What: 'Zero energy' teaching block invests in low-carbon

How: NIBE heat pump alongside host of green technologies

Result: £2.6 million building excelled in all 10 BREEAM assessment categories

South Lanarkshire College sets standard with NIBE ground source heat pump

A newly opened, 'zero-energy' teaching block at South Lanarkshire College in Scotland has been fitted with a ground source heat pump (GSHP) system from NIBE – helping it become the first building in the UK to achieve a BREEAM sustainability rating of 'Outstanding'.

Situated on the college's East Kilbride campus, the state-of-the-art, £2.6 million building has been specifically designed with first-rate environmental credentials in mind. It boasts a host of efficiency-enhancing measures, including highly insulated floors, walls and roofs, triple-glazed windows, low-energy lighting and electrics, rainwater harvesting and solar PV panels on the roof. Partnered with a water-based underfloor heating system, the energy-efficient NIBE F1345 40kW GSHP was specified to meet the heating requirements of the eight-classroom block in the most sustainable, cost-effective and reliable way possible.

The new facility excelled in all 10 BREEAM assessment categories, which range from energy, waste and water to health and wellbeing. The project was given £1.45 million-worth of support from South Lanarkshire Trust and £700,000 from the European Regional Development Fund. It was also awarded a further subsidy from South Lanarkshire Council's Renewable Energy Fund. NIBE's MCS-accredited F1345 GSHPs are designed for use in larger residential, commercial and industrial settings, and use ground, rock or lake as a heat source. Available in an output range of 24kW-60kW to suit applications of various sizes, the high-efficiency units perform at an industry-leading COP of up to 4.51 at 0/35°C. They also feature an integrated control system for bespoke programming and a multicolour user display for straightforward and intuitive operation.

BREEAM

What: Library upgrades to BREEAM excellent rating

How: £9.2 million features two ground source heat pumps and solar panels

Result: Provides CO2 reduction of 20% and slashes energy bills

Green tech by the book for new library

A number of green technologies are being installed at Halifax's new Central Library and Archive, as the building looks to achieve a BREEAM Excellent rating.

The £9.2 million development, set to open in October 2016 as part of Calderdale Council's multi-million pound Piece Hall Transformation Project, will feature two ground source heat pumps and solar panels to generate its own heating and electricity.

Main contractor GRAHAM Construction is working alongside mechanical and electrical firm Stothers Ltd, as well as The Renewable Design Company and Evo Energy to complete the installation.

Drilling rigs have created 16 boreholes into the bedrock within the Piece Hall courtyard, drilling to a depth of up to 150 metres to install pipes for the two Dimplex ground source heat pumps. These will be used to recover latent heat for the library and archives heating system.

The roof of the library will be fitted with 115 SunPower 327W solar panels, saving energy and providing a CO2 reduction of approximately 20% compared to a similar, standard building. Although there will still be some requirement to draw electricity from the National Grid, this will be significantly reduced.

The building will also be self-ventilating, providing a comfortable environment for people visiting the library and archive rooms.

Construction of the new Central Library and Archive is well under way, with the steel framework built and concrete floors now in place.

Facilities will include IT and digital media hubs, study areas, a children's library and a Visitor Information Centre.

BIOMASS

What: Scotland's oldest hotel finds eco energy solution

How: Two 180kW Windhager BioWIN Excel Kaskade systems

Result: Biomass system reduces building's carbon footprint and energy costs

Scotland's oldest hotel running on new green energy

Windhager UK's new technology biomass boilers have been installed to provide the heating and hot water to Scotland's oldest hotel.

The Salutation Hotel in Perth, one of seven hotels in the Strathmore Group, dates back to 1699 and is now Scotland's longest established hotel. It joined the group in 1991 and has undergone refurbishments including the installation of a 360kW Windhager biomass heating system.

Two 180kW Windhager BioWIN Excel Kaskade systems were put in by Newcastle-based installers Green Guru NE to provide heating and hot water to the 84-bedroom hotel. This replaced the hotel's gas-fuelled system to offer a greener solution for heating whilst significantly reducing the building's carbon footprint and energy costs.

Last year the Strathmore Group replaced the heating systems in all its seven hotels with 36 Windhager BioWIN Excel wood pellet boilers. The installation of two 180kW Kaskade systems, each comprising three Windhager 60kW BioWIN Excel automatically fed wood pellet boilers, at the Salutation was completed within the footprint of the hotel. This cascaded format provides a reliable supply of energy with automatic back-up from the other two boilers should one need to be shut down for maintenance.

These boilers operate a fully automated feed system so that minimal user interaction is required. The BioWIN Excel incorporates a self-cleaning burner bowl and a large ash box that only requires emptying up to three times a year to truly keep maintenance to a minimum.

SOLAR PV

What: Council unveils largest PV array built by a local authority

How: A 1.73MW photovoltaic array consisting of 6069 285W LG Solar panels

Result: Powers equivalent of 1,750 homes a year

Hounslow reveals UK's largest local authority solar PV array

The London Borough of Hounslow has unveiled its £2 million investment in solar – the largest PV array by a local authority in the UK and the first to adopt a battery storage solution.

The London Borough of Hounslow has started to covert the site of Western International Market (WIM), west London's largest wholesale market for fresh produce and flowers, into a carbon-zero zone. Together with the WIM, and working alongside key partners (including LG Electronics, Imtech, Sunstruck Energy, SolarEdge, Tesvolt, and Revolution Energy Services), the council has installed a 1.73MW photovoltaic array consisting of 6069 285W LG Solar panels, SolarEdge Inverter and DC power optimisers (for performance monitoring) and four 60kW Tesvolt lithium-ion batteries.

WIM currently consumes 3.5MWh of electricity per year to provide climate controlled facilities to approximately 80 wholesalers and buyers from across London, equivalent to powering 1,750 homes a year. The new system now generates half of all the site's required electricity. In addition, the system will contribute 2% of the council's carbon reduction target of 780 tonnes. The estimated cost savings are £148,000 a year; on top of the generation tariff and export tariff expected, the council will have a total of £255,000 in its back pocket in the first year of operation.

Human technology: Working together to build the hybrid home

The question we are all asking ourselves is where does the residential market go next? Are we moving towards new technology, perhaps battery storage? Or should we be focusing on what homeowners really need – a simple, all-in-one solution? Installers are in the unique position of being able to help, and the answer is already here. Welcome to the Hybrid Home.

A bit of history…

We started geo to provide a one-stop shop for people wanting to fit renewables to their homes. This was not as easy as it sounds. At a conference to launch the Government's new 'Microgeneration Strategy' only two people in an audience of 150 had actually bought a microgeneration system for their home.

This was a knowledgeable, committed and reasonably well-off audience, and we realised that the problem was not the technology – that was proven – but getting it to market.

Today

Ten years on and hundreds of thousands of solar PV installations later, and we're back at the same juncture with battery storage.

Let's not kid ourselves: people have been buying solar PV systems for just one reason, not for the technology, but to make money from subsidies.

This highlights a common problem. There is a concept, 'Crossing the Chasm', which says that at the early stages of a market, the challenge is price. Low volumes make costs high, as does poor customer awareness. Subsidies are designed to help cross this chasm: to build the market to the point where it can exist without subsidies because both product and sales costs are reduced.

The cost of panels is on a downward trend, but sales have not progressed far enough and subsidies have now been withdrawn – all before the market has become self-sustaining. If people can't generate income, the saving of electricity costs will not be enough to keep them investing in panels. The sales proposition has collapsed.

The problem with tech…

…is tech! Too often we expect it to sell itself, and while designers may understand it, the public don't, particularly when tech relates to energy. It's out of sight, so out of mind, so we need to find a way to engage more effectively.

Here are three suggestions:

Start simple

By helping people to understand energy itself. Making energy visible can be a simple first sales step – providing something that can help users visualise what they are using when. This is what smart meters will do through their in-home displays, energy apps and web portals. But no one has to wait for the arrival of their smart meter. Instead they can take advantage of simple, inexpensive energy feedback systems and promoting these will help installers build valuable relationships with potential clients.

Humanising technology

Tech should not look scary – something Apple has excelled in. But in our industry a lot of tech is 'fit and forget' with minimal user interface. So people do forget about it, which doesn't encourage repeat or recommended sales. Think how much more impactful a simple and engaging user interface would be if it clearly showed customers how much they are earning and saving.

Convergence and smarter energy

We all know the phrase 'the value of the whole is greater than the sum of the parts'. This is absolutely the case with energy. On their own, smart meters, solar PV systems, smart thermostats and storage systems struggle to deliver sufficient value to be compelling 'value propositions'. Put them together and introduce external data such as weather forecasting and you start to make energy smarter and build value.

Going Hybrid

Energy saving devices in cars have become commonplace. Think of engine management systems, stop-start technology, energy regeneration and battery storage. All of these have led to today's hybrid cars and the same process is at work in our homes.

The hybrid home, like a hybrid car, combines traditional and modern ways of delivering power: bringing together solar panels, battery storage, smart heating controls and smart meters working with Time of Use tariff options. At its heart is an Energy Management System (EMS) that helps individual technologies to work smarter. For example, the EMS might fully charge the batteries overnight because the forecast for the next day is typically English! If the forecast is for sun, the EMS will leave it to the PV panels.

But it is not just about the technology! It's also about providing a user interface that makes the technology accessible, and gives users control and value. Consider the role the dashboard plays in a hybrid car, constantly showing the driver how the system is working, and the value they are getting, as well as reassuring them that they are in control.

Because it works in the background, customers don't have to change their habits. When you buy a hybrid car you don't learn a new way of driving: so it should be with a hybrid home.

Why would anyone wish to buy a hybrid home? It comes down to providing a better living experience for less money – and installers can paint an irresistible picture, one that combines affordable comfort with energy efficiency.

The installer's perspective

Installation is absolutely central to the concept of a hybrid home: it cannot be done without installers. However, it will need to be a particular breed of installer, where installation is just one part of engagement with the user. This is not a simple 'fit and forget' proposition: it's about building an energy service relationship and becoming an Energy Service Company.

In our view this new installer model is central to re-invigorating the residential market. It will be built by people who forge a relationship with customers and help them understand the value of what they are buying, install it – and continue to monitor and service it.

This will help the hybrid home concept to flourish: by engaging customers from the start in an EMS that optimises energy supply and consumption. We're building such a system, the geo energy management system, but it can't come to fruition without the new breed of installers and the Energy Installation Services Companies of the future.

Simon Anderson, Chief Strategy Officer, geo

Figure it out

REI 10 – Share performance of UK's leading green energy companies

	52 week high	52 week low	February price	Current price	
Drax Group (DRX)	451.30	205.60	265.20	305.80	▲
Good Energy Group	255.13	200.00	199.00	229.00	▲
Intelligent Energy	151.50	67.00	45.00	12.87	▼
ITM Power	36.45	19.88	12.25	12.09	▼
Leaf Clean Energy	43.00	22.00	37.00	36.05	▼
PV Crystalox Solar	13.00	7.78	10.10	12.81	▲
Rame energy	11.00	5.75	8.80	8.50	▼
REACT Energy	9.00	2.00	3.90	5.25	▲
Renewable Energy Holdings	2.69	0.70	Suspended		
Rurelec	4.60	0.50	1.22	1.07	▼

Generation tariffs for solar PV

Tariff band	FiT rate (p/kWh) from 01/04/16 - 30/06/16	
< 10kW	Higher rate Middle rate Lower rate	4.32 3.89 0.74
10 - 50kW	Higher rate Middle rate Lower rate	4.53 4.08 0.74
50 - 250kW	Higher rate Middle rate Lower rate	2.38 2.14 0.74
250 - 1000kW	1.99	
> 1000kW	0.74	
Standalone	0.74	

* Currently subject to consultation

FiT Deployment caps that have been reached in tariff period 01 (01 April – 30 June 2016)

Deployment band	Cap limit (MW)	Cap reached?	Date and time of final installation to qualify	Capacity deployed (MW)
PV <10kW	76.96	No	N/A	2.56
PV 10-50kW	25.72	No	N/A	0.859
PV >50kW	14.5	No	N/A	6.79
PV standalone	5	Yes	08/02/2016 01:15	12.79
Wind <50kW	11.17	No	N/A	-
Wind 50-100kW	0.3	Yes	08/02/2016 00:15	0.542
Wind 100-1500kW	6.8	Yes	08/02/2016 00:18	21.730
Wind 1500kW-5000kW	10	No	N/A	-
Hydro <100kW	1.1	No	N/A	0.135
Hydro 100kW-5000kW	9.5	No	N/A	-
AD (All)	5	Yes	08/02/2016 00:15	15.67

Accurate as at 00:01 on 15 March 2016

Generation tariffs for non PV technologies

Technology	Band (kW)	Tariffs (p/kWh)
Hydro	< 100kW	7.68
	100 - 500kW	6.14
	500 - 2000kW	6.14
	> 2000kW	4.43
Wind	< 50kW	8.46
	50 - 100kW	7.61
	100 - 1500kW	4.89
	> 1500kW	0.85

(Source: OFGEM)

Cost comparison of heating fuels (not including RHI payments)

Fuel source	kWh provided per unit of fuel	Efficiency of system (%)	Units consumed by house (kWh)	Price per unit of fuel (£)	Units consumed per annum	Cost per annum
Heating oil (kerosene)	10 per litre	90	25300	0.31 per litre	2530 litres	£784
Wood pellets	4800 per tonne	94	24300	256 per tonne	5 tonnes	£1,280
Natural gas	1 per kWh	90	25300	0.04 per kWh	25300 kWh	£1,012
LPG	6.6 per litre	90	25300	0.38 per litre	3833 litres	£1,457
Electricity	1 per kWh	100	23000	0.14 per kWh	23000 kWh	£3,220
*Air source heat pump	1 per kWh	290	7931	0.14 per kWh	7931kWh	£1,110
*Ground source heat pump	1 per kWh	360	6389	0.14 per kWh	6389kWh	£894
Dual mode system 1						
Oil boiler (30% of heat load)	10 per litre	90	7590	0.31 per litre	759 litres	£235
*Air source heat pump (70% of heat load)	1 per kWh	290	5552	0.14 per kWh	5552 kWh	£777
Dual mode system 2						
Gas boiler (30% of heat load)	1 per kWh	90	7590	0.04 per kWh	7590 kWh	£304
*Air source heat pump (70% of heat load)	1 per kWh	290	5552	0.14 per kWh	5552 kWh	£777

Based on 23,000kWh needed to meet typical household's heating and hot water needs per annum. Prices and costs are indicative only and may vary.
*Calculations based on continuous operation at maximum efficiency. Fuel costs taken from Nottingham Energy Partnership and other sources.

RHI non-domestic rates

Tariff name	Eligible technology	Eligible sizes	Tariff rate (pence/kWh)	Tariff duration
Small biomass	Solid biomass: Municipal solid waste (inc CHP)	< 200 kWth	Tier 1: 3.62 Tier 2: 0.96	20
Medium biomass	Solid biomass: Municipal solid waste (inc CHP)	200 kWth and above, < 1000 kWth	Tier 1: 5.24 Tier 2: 2.27	20
Large biomass	Solid biomass: Municipal solid waste (inc CHP)	1000 kWth and above	2.05	20
Small ground source	Ground source heat pumps, water source heat pumps, deep geothermal	< 100 kWth	Tier 1: 8.95 Tier 2: 2.67	20
Deep geothermal			5.14	
Solar thermal	Solar thermal	< 200 kWth	10.28	20
Air source heat pumps	ASHPs	All	2.57	20

(Source: OFGEM)

Domestic RHI deployment

Technology	Accreditations (Apr 14–Mar 16)	% of total
ASHP	20,953	45
GSHP	6,803	15
Biomass	11,443	24
Solar thermal	7,521	16
TOTAL	46,720	100

(Source: DECC)

Number of MCS registered installers per technology

Technology type	Cumulative	Registered Feb 16
Solar PV	2173	9
Biomass	282	2
Air source HP	708	7
Ground source HP	517	0
Solar thermal	736	5
Small wind	66	0
Total	4482	23

(Figures supplied by Gemserv)

Number of MCS registered installations per technology

Technology type	Cumulative	Installed April 16
Solar PV	866832	3962
Biomass	16599	50
Air source HP	46157	533
Ground source HP	12523	178
Solar thermal	8463	55
Small wind	5041	10
Total	955615	4778

Domestic RHI tariffs

Technology	RHI rate (from 1 April) (p/kWh)
ASHP	7.51
Biomass boilers	5.20
GSHP	19.33
Solar thermal	19.74

(Source: DECC)

Who are you? Charles Hargreaves, Associate Director – Renewable Electricity, Ofgem E-Serve

What do you do? I'm head of the Renewable Electricity directorate at Ofgem E-Serve, which is the division of Ofgem responsible for administering green energy and social schemes on behalf of government. I look after two of the Government's key policies to promote electricity generation from renewable sources, the Renewables Obligation and the Feed-in Tariff. We also administer the smaller REGO scheme.

Keeping pace with Government changes

Monday

Every Monday I attend a key meeting with E-Serve's Managing Director and my peers from the renewable heat schemes and the energy efficiency and social schemes to discuss the latest developments across our division. This week the key discussion points were the consultations DECC will be publishing in the coming weeks and the implications for the schemes we administer, the speaking engagements that are lined up across the teams, and the customer service training we have planned. From my own area the key update for the week was the team's progress against the FiT levelisation process, the process that ensures the costs of the scheme are borne fairly across the suppliers. This year the scheme will be worth in total more than £1.1 billion.

Tuesday

I meet with the Development team to discuss the latest policy changes that are under discussion. Ensuring these changes align with the current processes we have for administering the schemes helps to ensure smooth operation in the future and will make applying easier for developers. The Renewable Electricity schemes we administer, in terms of the subsidy that will be paid out, are worth more than £5 billion in 2016/17. It's really important to ensure we can operate the schemes effectively as anything that undermines this could seriously dent confidence in the market.

Wednesday

Part of our key responsibilities is to produce guidance for the participants in the schemes we administer. This helps developers understand what they have to do to get their projects accredited and helps improve the quality of the applications. Higher quality applications means there's less for us to follow up on and will ensure applications can be accredited more quickly.

With all the changes to the schemes since the election our guidance for both the Renewables Obligation and the FiT has had to be updated on a number of different occasions. More recently we have introduced FAQs and other helpful hints for applicants, which have helped improve the standard of the applications from some developers. The latest updates I was asked to approve on Wednesday are for the Energy Bill, which has just finished its passage through the House of Lords and House of Commons. We had to watch the changes at the ping pong stage carefully as for some stations they meant the difference between being eligible or not.

Thursday

The Renewable Electricity team in Ofgem E-Serve has roughly 90 people at present and to ensure the smooth running of this group each month I have a board meeting for all the team leads and key advisors from the legal and finance teams. Today, amongst other things, I'll be setting the agenda for the next meeting. This month we'll be reviewing the take-up of renewable electricity to help us understand how much the schemes are likely to cost in future. We will also look at some of the more difficult decisions we have to make. Developing renewable stations needs careful planning, but there are firm deadlines in the legislation we have to adhere to. If these are not met then a station could become ineligible for support. Ensuring support only goes to those eligible is a key part of what we do.

Friday

Friday is a good day to catch up with the team and understand more about the latest developments on the schemes. Since the election the Government has made a number of changes to the schemes we administer to control the costs. This led to developers accelerating their plans to beat any deadlines that have been imposed and in the month of September last year the number of applications with a capacity of more than 50kW to the FIT scheme was nearly as many as we would expect in a year. The team has made good progress and is achieving its target for processing applications.

Other developments include the Government's consultation on the Energy Intensive Industries, where the proposal is to alleviate these industries from the costs of the Renewables schemes. We need to monitor this closely as it will lead to some important changes to the way the money flows across the schemes. As ever, it has been a full-on week and the schemes we administer continue to throw up new challenges!

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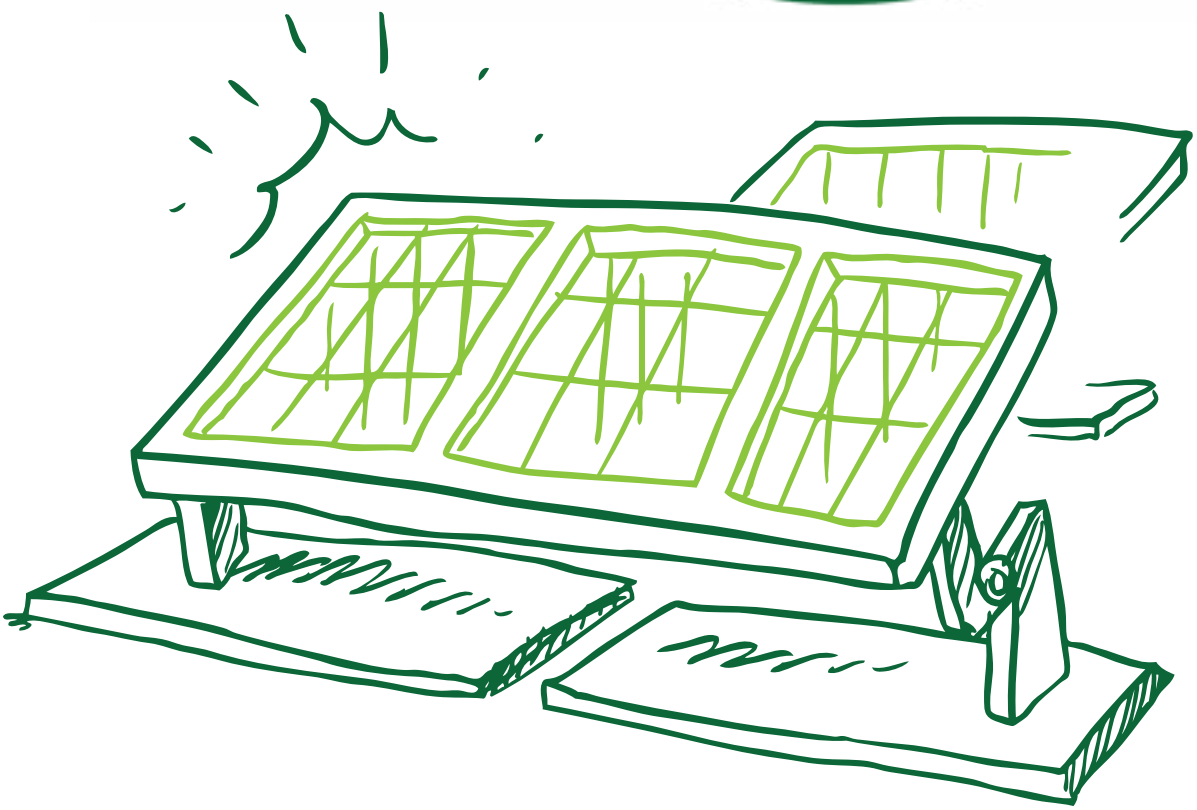

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