

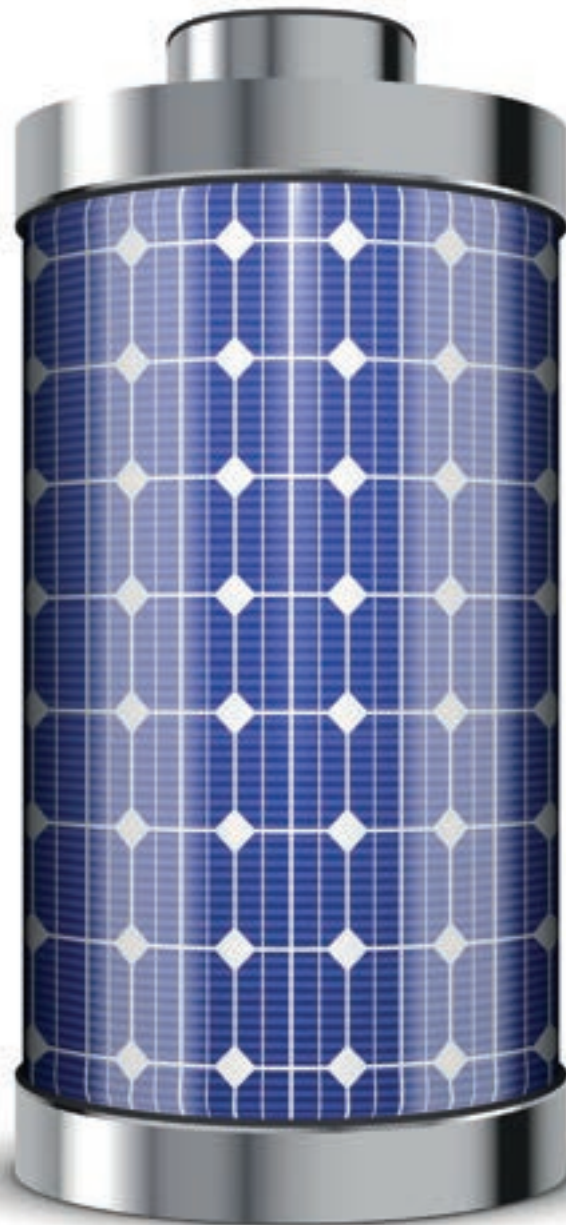
# Renewable

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# Looking forward

**W**elcome to the latest issue of *Renewable Energy Installer* magazine. The next few months will be interesting times as we invest in delivering more content across more pages of the magazine. We will be creating new sections to continue the focus on the opportunities that energy storage will deliver, as well as dedicated space for community and district energy projects, energy efficiency and electric vehicles.

A new seven-day newsletter, *REI Weekly*, will keep the installer community fully apprised with the latest news from manufacturers and suppliers, as well as updates on rules and regulations, case studies and events.

Our next issue will feature the Top 10 Products for 2017 and the list is already a fascinating insight into the innovation that is pushing the renewable energy industry forward and bringing down costs for the consumer. As always, we welcome your input and feedback.

This month has provided mixed fortunes for many in the market. Business is moving forward but margins continue to be squeezed with the plunging value of the pound. Installers are embracing the new innovation that is arriving almost weekly on the UK market and the consumers are beginning to realise that renewable energy is as cost-effective as ever before – with or without the subsidy support.

Looking ahead, the new year has the promise to bring fresh momentum to a sector that has experienced a difficult year to date.

## Editorial panel members



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SEA



**Garry Broadbent,**  
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## New firm to focus on refurbished wind turbines

A new company specialising in the planning, procurement and installation of refurbished wind turbines has opened for trading in Machynlleth, Wales. Second Wind Energy will be supporting community groups and farmers in finding and installing the right refurbished turbine for their project.

Development Director Kim Bryan said: "Many wind energy projects have been shelved due to Government backtracking on renewable energy. However, refurbished wind turbines, at a fraction of the cost of a new turbine, are a viable alternative for those still wanting to develop wind energy projects.

"Wind energy is still a fantastic way for farmers and communities to generate clean, green electricity and also additional income."

There are more than 100 refurbished wind turbines installed across the UK on farms and estates and by community groups. Second Wind Energy estimates that payback on refurbished wind turbine installations in many cases will be four years. All of the turbines sold by Second Wind come with a service history and five-year warranty and are capable of generating the same output as a new turbine during a similar life span.

Bryan added: "It is now more vital than ever that we tackle climate change. We know that renewable energy is key to achieving lower carbon emissions and at the same time can generate much needed revenue for community groups and farmers."



## SOLARWATT appoints Wind & Sun distribution partner as demand rises

SOLARWATT, the German pioneer of high-performance dual-glass solar PV energy production and storage systems, has appointed Wind & Sun as a distributor in its expansion, aimed at bringing advanced generation and management systems to UK homes.

The company will work with Wind & Sun, based at Leominster in Herefordshire, so installers and their customers can choose products manufactured by Germany's leading solar provider. Established in 1984, Wind & Sun now serves clients around the world. Its reputation comes from extensive hands-on experience in renewables and developing many new applications for the wider industry.

Installers can now buy SOLARWATT modules at Wind & Sun, benefiting from fast delivery times, advice and support.

With 23 years' experience and employing more than 200 people at its leading-edge manufacturing and logistics centre in Dresden, SOLARWATT is committed to expansion following a substantial investment by Stefan Quandt, of the family that owns BMW. Solar power is gaining traction due to international carbon reduction obligations and concerns over energy costs and fuel security – boosted by technology advances such as SOLARWATT's groundbreaking MyReserve storage system.

Working with installation companies, Wind & Sun provides a wide range of renewables products along with system troubleshooting, training, product knowledge and technical support. Other customers include NGOs, utilities and municipal authorities.

## Climate action drives global energy transition

Large energy buyers across the world have woken up to the unstoppable force of the UN climate treaty and it's not just about lowering carbon usage. As businesses and cities explore the opportunities brought to them by innovative technology, low carbon generation and clever ways to manage their energy, they are realising savings with and without onsite solar. Clean Energy Live (3-5 October) is a showcase for innovation, demonstrating the technology and business models that are delivering energy at lower cost and lower carbon.

Up to 5,000 attendees were expected in Birmingham to discover new opportunities following the shift in the power market. Formerly Solar Energy UK and now in its seventh year, Clean Energy Live is the meeting place for large energy buyers, clean generators, emerging technologies, financiers and advisors, with four theatres focused on Solar, Storage, Clean Tech Installations, Future Utilities and Energy Management plus an exclusive EV Pavilion.

At the four cutting-edge conferences, delegates hear from landowners, rooftop owners, DNOs, electric vehicle companies and energy buyers decarbonising their own operations.

## Biopower market to reach 165.2GW of installed capacity by 2025

Despite a slump in annual additions, the global biopower market is set to show steady growth, rising from 106.2GW of installed capacity in 2015 to 165.2GW by 2025, at a compound annual growth rate of 4.4%, according to research and consulting firm GlobalData.

The latest report states that global biopower is likely to grow at a significant rate in the future. Although bioenergy is not a new concept, recent advances have improved performance and reliability. Increases in global energy demand and climate change concerns are the primary growth drivers.

GlobalData Analyst Anchal Agarwal said: "Waste management practices such as composting and land filling indirectly support biopower generation, and many industries have set up biopower facilities to handle their waste. With proper financial support and government mandates, biopower installations have become a more viable option, and an appropriate solution to the issue of waste management. Conversion of waste into energy resolves the issues of waste management and sustainable energy."

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## Solar panel testing company is placed into administration

Property and asset consultants at Lambert Smith Hampton (LSH) have been instructed to carry out a sale of the assets of IPSol Energy, a Nottingham-based solar panel testing company, following the appointment of administrators last month.

IPSol Energy has been operating since May 2009 and is the UK's only UKAS accredited solar panel testing company, providing business and technical solutions to the solar PV market with a focus on testing and certification. Whilst the company has become well established, it has suffered along with the renewables industry in general with the reduction in subsidies, resulting

in cash flow problems. Ultimately this has forced the company to cease trading.

LSH has been instructed to sell assets including two ACS solar panel environmental testing chambers (2011), a Pasan solar panel UV test unit and a solid state solar simulator.

A spokesman said: "This sale is perhaps indicative of a wider difficulty in the alternative energy sector, which has experienced a degree of consolidation over the last year or so. However, there is still interest in renewable energy resources and an appetite for good equipment from firms which have established good traction in the market."

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## Schneider Electric launches Light It Up

Schneider Electric, the global specialist in energy management and automation, has launched Light It Up, its programme to bring access to electricity to rural communities across the Asia Pacific region.

Schneider Electric believes that access to energy is a basic human right, and it is committed to putting safe, reliable, efficient and sustainable energy within reach of a great many households. From mid-September to early November this year, Schneider Electric employees will distribute more than 1,800 units of the Mobyia solar lamps to communities in 12 countries across the region.

Globally, around 1.3 billion people still lack access to modern energy, while another

billion have only unreliable electricity networks. A significant proportion of the world's energy poor are in Asia. In countries like Myanmar and Cambodia, the rural electrification rate can be as low as 18%.

In the past six years, Schneider Electric has contributed to providing five million people with access to energy. The goal is to reach 50 million within the next 10 years.

With the Light It Up campaign, solar lamps will be distributed in rural areas across Bangladesh, Brunei, Cambodia, Indonesia, Laos, Malaysia, Mongolia, Myanmar, Pakistan, the Philippines, Thailand and Vietnam, connecting over 1,300 families to electricity and lighting, and helping to improve living conditions.

## North Star Solar announces battery deal with Leclanché

North Star Solar has announced a strategic partnership with Leclanché to use the battery company's TiBox home energy storage system. The TiBox uses Lithium Titanate cells and was selected by North Star primarily for its battery chemistry strength and reliability.

North Star has developed a unique financing model that allows end-users to enjoy high savings in electricity costs with repayments coming directly from energy savings – no upfront payments required. The TiBox is integral to North Star's offering based largely on the high number of cycles.

North Star CEO Paul Massara said: "The 20-year life and 20,000 cycles of the TiBox sits well within our model and we are very excited about our partnership with Leclanché."

North Star partners with local authorities and housing associations nationwide. Having recently announced its first deal with Stanley Town Council, County Durham, several more are set to follow soon.

Anil Srivastava, CEO of Leclanché, said: "Leclanché is excited to be selected as the supplier for Battery Energy Storage Systems by North Star Solar. This new operational model opens the way to a far more efficient use of overall energy. Smart cities and connected homes are a new step illustrating a wider revolution in the energy generation and distribution market."

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## Solar steam to be focus of academic report

Renewables technology developed by Bourne-based Lark Energy, part of The Larkfleet Group of Companies, is to be the subject of a research paper by leading academics.

Dubbed 'solar steam', the technology concentrates the power of the sun's rays to heat water to create steam, which can be used as an energy solution in industrial processes.

As part of a Knowledge Transfer Partnership (KTP) researchers based at Lark Energy and Cranfield University are exploring the possibilities of the new technology. The results will be submitted to peer-reviewed academic journals for publication later this year.

KTPs enable businesses to improve their productivity and competitiveness through

government-funded partnerships with colleges and universities. A KTP is a three-way partnership between the business, an academic institution and a recent graduate. The recent graduate is employed at the business and brings new skills and knowledge. The business gains access to academic expertise that it wouldn't normally have in-house.

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## New guide to help get retrofit right

A new practical guide for asset managers tackling retrofit insulation projects has been launched at one of the largest professional gatherings in the social housing calendar.

'IWI for the Asset Manager' has been produced to help address misconceptions around projects to insulate walls, particularly through the use of Internal Wall Insulation (IWI).

The guide is the first publication from IWI specialists Matilda's Planet, forming part of their commitment to help drive quality throughout the supply chain. Their underlying belief is that a better informed retrofit team (including asset managers) will result in more successful projects.

The guide sits alongside Matilda's Planet's role as a founding member of The Retrofit Academy, a community interest company offering training to upskill housing professionals with a remit for energy efficiency retrofit.

Featuring a foreword from Professor David Strong, former Managing Director at BRE Environment, the guide offers valuable advice on factors impacting vital energy efficiency programmes across the housing sector.



## National Trust wins energy award for 'modern art' solar array

The National Trust has won a national energy award for a unique solar PV project, which has been compared to an art installation, on a hillside at one of its most popular gardens in North Wales.

The solar array, at Bodnant Garden in the Conwy Valley, was named National Small-Scale Project of the Year at the Energy Efficiency and Retrofit Awards in Birmingham.

The 50kW system generates around 43,000kWh of electricity at the site, which sees over 200,000 visitors each year. It powers the onsite Pavilion Café along with two electric vehicle charging points in the neighbouring car park and also recharges the batteries of power tools used in the gardens.

The 175 panels, laid on a curve in the hillside, were made by Panasonic as part of its partnership with the National Trust. The money saved from energy bills will directly fund the Trust's conservation work.

Paul Southall, Environmental Advisor at the National Trust, said: "Every Trust property has its own unique spirit, and we've got to make sure that whatever we install is appropriate in the right place.

"The success of this scheme is down to the collaborative approach between the property staff, the designer and installer Carbonzero renewables, and the team at Panasonic, who all worked to ensure the finished system sat appropriately within its environment."

## The role of heat networks in decarbonising UK homes

Heat networks are good value and crucial to decarbonising domestic heating in the UK, according to a new report by influential think tank Policy Exchange, entitled: 'Too hot to handle? How to decarbonise the way we heat our homes'

The report reveals that greenhouse gas emissions from domestic heating have fallen by 20% since 1990, compared to a reduction of 50% in the power sector, and suggests a radical overhaul of the government's heat strategy to do better on domestic heat.

Among the policy recommendations is a proposal to increase the roll-out of heat networks, which Policy Exchange says currently only supply around 1% of households, but could serve 10 to 20%+ of households by 2050.

The report calls for Ofgem to develop a bespoke regulatory framework for heat networks and for the government to do more to increase the share of heat networks and de-risk investment, which echoes the Association for Decentralised Energy (ADE).

## Renewable gas market makes major breakthrough

The global standard against which large organisations measure, manage, and report GHG emissions, the Greenhouse Gas (GHG) Protocol, has recognised that Green Gas Certificates, issued by the Green Gas Certification Scheme (GGCS), can support a business's reporting of onsite GHG emissions.

Through the use of Green Gas Certificates, which track the use of grid-injected biomethane, companies can report near-zero GHG emissions for gas combusted onsite due to the biogenic nature of the biomethane being sourced.

These changes are backed by the CDP (formerly the Carbon Disclosure Project), which monitors companies' GHG reductions. The CDP's latest UK annual report states

that 232 companies out of the FTSE 350 now disclose their GHG output to the CDP.

The GGCS liaised closely with the GHG Protocol team, based in Washington, and the CDP, to ensure that its Green Gas Certificates fulfil the reporting criteria of the Protocol. Research undertaken by leading environmental consultancy Ecofys for the GGCS helped ensure that the scheme complied with Protocol rules.

Biomethane is a renewable gas produced through the anaerobic digestion of food and other organic wastes. Good Energy has announced that 6% of its green gas supply is made up of biomethane injected to the grid. This biomethane is sourced from UK anaerobic digestion plants registered through the GGCS.

It expects this percentage to increase in future. Good Energy is using Green Gas Certificates as evidence that the biomethane has been injected, and has not been double counted in any way.

Further domestic energy suppliers signed up to the GGCS include Green Energy UK, now supplying customers with 100% green gas from UK AD plants backed by Green Gas Certificates; and LoCO2 energy, supplying 10% of gas from biomethane.

Sacha Alberici, Senior Consultant, Ecofys, said: "Companies will now have greater confidence in using Green Gas Certificates for their corporate accounting of the purchase of biomethane, which will help to further stimulate development of the green gas market in the UK."



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# Solar + Storage = Opportunities

The Solar Trade Association has published its first paper on the opportunities that energy storage technology can deliver for the renewable energy market

Over the past year, the Solar Trade Association (STA) has been evaluating the opportunities for energy storage in the context of solar power in the UK. It is clear that storage and its interaction with solar will be a very significant building block of the clean and smart energy system the future demands.

Consensus is emerging among respected analysts such as the view of bodies like UBS, National Grid, Deutsche Bank and Energy that solar + storage can play a key role in the energy industry in the timeframe of 5-10 years. The STA's own analysis suggests that there will be step-changes in cost and innovation that should enable battery storage to establish its place within the UK energy system. However, there are a number of regulatory and economic barriers which could limit the widespread deployment of new, decentralised storage systems if these are not resolved in the short term.

Post the Paris Climate Agreement, there is a clear signal for a move towards a low

carbon energy system. The characteristics of renewables dictate a more decentralised energy system with greater need for the system to respond flexibly to the output of wind and solar in order to balance supply and demand. The highly distributed nature of solar in particular is blurring the line between producers and consumers of power. Energy storage promises to optimise solar output for both individual investors and for the wider power system. The tremendous value this would add to clean power generation has attracted global attention.

Recognising global momentum on storage, the UK Government is examining the role a smarter energy system could play to achieve its three objectives of energy sustainability, affordability and security (known as the energy trilemma) through the Smart Energy project jointly run by BEIS and Ofgem. The Government's adviser, the National Infrastructure Commission, has estimated that a more flexible power system could save

consumers up to £8bn per annum by 2030. The flexibility renewables need therefore also offers tremendous cost benefits. The time is right for the STA to evaluate the role solar + storage could play within that smarter energy system.

The solar + storage market is estimated to be worth \$8bn globally by 2026 and there will undoubtedly be opportunities for UK solar companies as the market develops. The nature of these opportunities varies significantly within the different solar sub-markets. The domestic solar + storage market contains a number of different business model options, which will be the subject of innovation over the coming years. The commercial and larger-scale solar + storage markets are more challenging to define, but there will be growing opportunities for STA members to deliver benefits through the addition of storage to their solar offering in the future.

Solar is not the only driver for storage deployment: standalone storage systems – those not tied to solar – can deliver value for the grid by providing services such as





balancing, frequency response, voltage support and reinforcement deferral. In its initial paper the STA's focus is on the interaction between solar and storage, and the value that can arise from the combination of both.

On the basis that storage is a long-term game changer, rather than a short-term market bubble, the STA's focus is on laying the foundations to enable a sustainable solar + storage market to develop. These 'foundations' require the development of robust product and installation standards, working with stakeholders, to ensure safety and quality. It also requires a regulatory framework that responds to the unique characteristics of storage and ensuring that storage systems can participate fully in the markets they could service.

Storage needs to be clearly defined so that an appropriate regulatory framework can be developed at EU and UK level. This should result in a level playing field for the diverse applications of solar + storage across the power system. At this stage, direct financial support from central government for solar + storage systems may not be the right action, though other countries are providing stimulus to support the development of their storage sectors. Given the rapid progress in storage technology, it is likely the economics will be fundamentally more attractive by the time essential regulatory hurdles are overcome in the UK. The STA calls for a continuation of monitored field trials, which have already provided significant value through knowledge sharing.

This position paper identifies the STA's initial proposed actions in the storage field. Over the coming year, the organisation will engage further with relevant bodies to ensure a consistent and strong message is heard on the benefits that solar + storage could deliver to the wider energy system. The STA will work with its members to enable them to develop a solar + storage market in the UK, ensuring high-quality, safe installations under a clear, supportive policy and regulatory framework.

### What is energy storage?

Energy storage has existed, in different forms, for centuries. From storage heaters and hot water cylinders to pumped hydro systems, there are significant variations in scale, technology, cost and operations of different energy storage solutions. For those not familiar with the subject, a research note produced by the Parliamentary Office of Science and Technology (POST) in April 2015 and a recent paper by consultants WSP Parsons Brinckerhoff explain the different storage technologies.

In the past, energy storage mainly took the form of small-scale heat storage (eg. domestic storage heaters) or large-scale electricity storage (eg. pumped hydro). These played important roles in making the best use of the electricity system when demand was low and ensuring its security when demand was high.

More recently, the development of other energy storage technologies has accelerated, including batteries, compressed air, flywheels and hydrogen. In particular, the research and innovation by the automotive industry for electric vehicles has driven the costs of batteries down significantly. For example, the cost of lithium ion batteries has fallen from more than \$3,000/kWh in 1990 to less than \$200/kWh today. Breakthroughs are frequently made at an academic level, with Advanced Research Projects Agency-Energy – a branch of the US Department of Energy – recently announcing it had attained some "holy grails in batteries". Innovation has not been confined to electrical energy storage, with companies such as Sunamp developing small-scale heat batteries.

The different technologies, locations and scales of energy storage systems lead to very different use cases and business models. The range of models, stakeholders and key players in these different sub-markets is an interesting and complicated landscape that will become clearer over the coming years.

### Why is energy storage important?

A number of global trends explain why storage is strategically important in the long term.

Firstly, renewables (solar and wind in particular) are reaching, or close to reaching, parity across the world on a levelised cost basis with conventional centralised generation, either coal, gas or nuclear. This trend is set to remain, as in the long term the costs of renewables will continue to fall. Deutsche Bank analysis last year identified 30 countries and 14 US states where solar is at grid parity and this is set to spread to other nations over the coming years.

Secondly, the move towards a low carbon energy system – accelerated by the agreement in Paris in December 2015 – is now a priority for governments across the world. The timescale by which this will be achieved, and whether this will be enough to avert dangerous climate change, is a source of debate, but the direction of travel is clear.

Thirdly, the combination of these political and technological drivers means decentralised renewables are likely set to dominate the world's energy supply in the long term,

providing cost benefits to consumers. Decentralised, ambient renewables such as wind and solar have a zero or very low marginal cost of generation but their generation profiles are variable. Consequently, supporting variable renewables through greater system flexibility is increasingly important for the development an efficient, low carbon and secure energy system.

For end-users, storage allows more solar to be consumed as it allows solar to be available around the clock. The benefits are clear and adoption is rapid; in 2015, 41% of new solar PV systems in Germany were tied with energy storage.



For power network operators, flexibility, including demand side response (DSR), energy storage, interconnection and dispatchable generation plants, are vital for the integration of non-dispatchable renewables. Storage already provides flexibility in the power system, notably through pumped hydro, but the importance and diversity of storage systems is set to grow to enable this future energy system. For example, IEA modelling showed 310GW of additional electrical storage by 2050 could support the transition to a fully decarbonised electricity system across the United States, Europe, China and India.

In summary, there is a move towards variable renewables and more decentralised and flexible energy systems globally, which have benefits in terms of costs, carbon and certainty (security of supply). Storage can play an increasingly important role in this transition, which provides the potential for a vast market in the long term.

## Changes at the BRE National Solar Centre

The National Solar Centre is shifting its focus in response to the evolving market. **Steve Pester**, Principal Consultant, BRE, explains...

**N**ever a dull moment in renewables! The National Solar Centre (NSC) is evolving with the rapidly changing market – and politics!

With the move into the manufacturing industry of NSC director, Jonny Williams, whom many of you will have come to know over the past two years, and who has done a fantastic job of raising NSC's profile and forming collaborations, we have taken the opportunity to take stock and change direction slightly.

Whereas NSC previously concentrated on a broad range of services, with consultancy being the mainstay, we are now leveraging other BRE strengths in research, certification and training, engaging virtual teams across the whole organisation.

On the research front, we are working with universities and government on topics such as fire safety and effects of PV on ecosystems, and we are actively considering further collaborative research topics.

We have just launched a certification scheme for



building-mounted PV systems above 50kW, which we think will provide confidence to building owners, asset managers and financiers whilst allowing system developers to differentiate themselves in the market. Further schemes are also planned.

And the third strand – training – is something that BRE has provided for many years, but now leveraging the success of the BRE Academy, we will be expanding our online and classroom training to meet the ongoing thirst for renewables know-how for all audiences, not just the solar industry. Watch this space!



Is renewable recovery taking root? asks **Bill Wright**, Head of Energy Solutions, ECA



**T**he Energy and Climate Change Committee recently warned that the UK was set to miss out on its 2020 renewable energy targets, and called for substantial policy changes to rectify the shortcomings.

But it wasn't all doom and gloom. The Committee recognised that the UK is likely to exceed its goal for electricity; positive news after a year in which changes in policy have led to a difficult climate for the renewable energy industry.

Despite this, during the summer further renewables projects were given the green light – the most notable of these being the Hornsea Project two. This project, which was announced in August, and will provide power for 1.6 million homes and boost employment in Grimsby (my hometown) and Hull – areas that have been in need of job opportunities and will, undoubtedly, welcome the boost it will give their economies.

We need more projects like this one. Progressing the Swansea Tidal Lagoon would provide an economic boost to South Wales and a more forecastable level of renewable power. Although it has been pipped to the post by a much smaller scheme in the Shetland Isles, it will be the first large-scale project of this nature in the UK – and one whose benefits extend beyond energy efficiency.

Of course, there remains the problem of ensuring a stable distribution system that can cope with varying loads but this too seems to be being addressed, albeit tentatively, with the Government consulting on ideas for improving energy storage earlier in the year. The next step is to ensure the process can be managed in a way that works for all involved and doesn't discourage innovation and evolution – not a small ask by any means.

Despite a stuttering over the last 12 months, it seems that the age of true renewable power is right around the corner. Maybe 2017 will be the year we finally get there...

CURRENT AFFAIRS



## The National Grid – a Brexit solution?

**Gordon Moran**, writing for the European Energy Centre, explores the opportunities to strengthen the National Grid following the UK's vote to leave the EU

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Substantial progress has been made in decarbonising the UK economy. For example, by 2014 the UK had reduced its carbon emissions by 35% compared to 1990 levels. Additionally, the amount of energy generated from renewables had increased from 2% in the early 1990s to approximately 25% of total generation.

In the wake of the Brexit vote, fresh concerns have been aired about whether this progress will be maintained. However, there is still a great deal of ongoing investment in new infrastructure, such as new onshore and offshore wind, and developments in biogas, tidal and other technologies. In order to manage greater proportions of electricity generation from variable sources, National Grid plc (the system operator for the whole UK Grid) is undertaking a range of projects to modernise the Grid and make it more resilient.

Part of this involves upgrading and reinforcing UK power lines, such as the Beaulieu-Denny line connecting the Scottish Central Belt to Northern Scotland, providing much-needed additional capacity for new renewable energy projects.

There are also interconnectors linking different parts of the UK, as well as those linking the UK to other European countries. There are plans to expand this network to link the UK with Belgium, Norway, Denmark and Iceland, with a second connection to France and internal links connecting Scotland, Wales and the Western Isles to the National Grid.

These developments will provide greater capacity to help stabilise the Grid and ensure that the infrastructure is available for further deployment of renewable technologies, bolstering investor confidence in the UK market.

These initiatives also promote international collaboration and enterprise between countries, and will help ensure the UK remains part of a wider European cooperation on energy, irrespective of EU membership.



## MCS Installer Accounts

Due to updated data protection policies, MCS has changed its protocol on access to installer MCS accounts. From **August 1st 2016**, any installer account with a suspended or removed date on the MCS database has been denied access to their account.

Access to old accounts can be given on a temporary basis for some installers:

- If you have changed Certification Bodies from BRE to NICEIC, MCS will be able to provide you immediate access to your BRE account.
- In other cases where you have changed Certification Bodies or have been given a different Certification Number, you will need to email MCS at [mcs@gemserv.com](mailto:mcs@gemserv.com) to inform us that you would like access to your previous account and include the certification numbers of both accounts. MCS will contact the relevant Certification Body for confirmation that these accounts are from the same company. Once this is confirmed, access can be provided.

If you are no longer MCS Certified, you will not be able to access your old account for data protection reasons. If a customer approaches you for amendments to their MCS certificate, please advise them to contact MCS for further advice.

If your old account is reinstated you will have access to this account on a temporary basis, as the current Management Panel is in discussion about the accessibility of these accounts. If access is given, please be aware that access to the account could be taken away without warning when a final decision is made. MCS advises that you download and save any information you may need from the account in the future.

Please note that you will not be able to create any new certificates in the old account – you can only amend certificates.

*If any installer believes that their account has been wrongfully removed or suspended from the MCS database, please contact your Certification Body for further explanation and potential reinstatement. Your Certification body will then inform MCS directly so we can reinstate your account.*





## Poll: Brits prefer renewable energies for the future

**B**ritish energy consumers believe renewable energy is more cost efficient and more reliable than fossil or nuclear sources, the findings of a new poll have revealed.

German market and economy research company EuPD Research recently surveyed 1,000 British homeowners about energy matters and photovoltaics. One of the results is that the British prefer renewables for their future energy supply.

Furthermore, they believe that renewable sources are already outcompeting fossil or nuclear sources in financial aspects.

Within the past few weeks the UK Government green-lighted the construction of the controversial nuclear power plant Hinkley Point C after slashing Feed-in Tariffs for solar power right at the beginning of the year. Those decisions set a clear sign for the future course of energy politics in the country.

First results of the 'Home Owner Study on Photovoltaics UK 2016' by EuPD Research

show the British wish for a transition towards renewable energies.

The question, 'On which energy sources should the UK rely for future energy supply?' was answered by more than half of the respondents with 'wind, solar and hydro'. Only a third named nuclear power among the future power sources. The fossil fuels coal and oil are seen as backward. Less than 10% of the study participants see these sources as part of the future energy mix.

Moreover, the respondents believe in the competitiveness of renewable energies. 22% of the participants stated that they believed solar power to be the cheapest energy source in the UK, followed by about 17% of the respondents naming wind.

"These recent results offer further evidence that renewable energies are broadly accepted by the people, while being hindered on the political level," commented Dr Martin Ammon, who heads up the energy department at EuPD Research.

Research Analyst Inga Batton explained some more of the results to REI.

She said: "We presented the participants with a couple of statements about PV and the one that found the strongest agreement was: Regular citizens producing and consuming their own electricity is a good thing. 44% of the respondents fully agreed to this statement.

"This was followed by: PV systems are expensive. With 23% fully agreeing to this.

"As for knowledge about PV systems, we asked the participants to estimate the price and installation time need for a PV system to be installed on their roof (the study assumed that in most cases this will refer to a typical 3-4kWp system).

"Over £4,000 –£6,000 was the most common estimate with 21% of respondents. This was followed by: Over £6,000 –£8,000 with 19% of those surveyed.

Inga added: "The average length estimated for a PV system to be installed was 4 and a half days."





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

# ProductNews



## Greenstar Xtra

### Worcester Bosch Group

Worcester, Bosch Group has launched a brand new boiler flue gas heat recovery unit, designed to help housebuilders and public sector providers achieve the best possible hot water efficiency levels.

The Greenstar Xtra unit connects directly to the flue of the boiler and uses a highly efficient plate heat exchanger to extract residual energy from waste gases. This energy is then used to pre-warm the incoming mains water that feeds the combi boiler – reducing the overall amount of gas required to heat the water to the required temperature.

Developed to help properties achieve highest possible SAP ratings, the unit limits gas consumption and CO2 emissions.

The compact design of the Greenstar Xtra ensures ease of siting and the flue options of 60/100mm and 100/125mm diameters result in flexible installation. Unlike other heat recovery systems, the unit does not require a blending valve or an additional mounting plate meaning that the time taken to fit the device, and the associated labour costs, are kept to a minimum.



## Solar-plus-storage package

### Moixa

Moixa, the UK's leading home battery company, has announced a new £4,995 combined solar-plus-storage package, which will allow customers to benefit from the smart power revolution.

The package, targeted at homeowners, housing associations and other landlords, bundles a 2KWh Moixa Smart Battery with a 2kW, eight-panel solar photovoltaic system for an installed price of £4,995 including VAT.

Speaking at the Clean Energy Live exhibition in Birmingham in October, Chris Wright, Moixa Chief Technology Officer, said: "We believe our solar-plus-storage deal is a market-leading offer. It will protect customers from rising electricity prices and allow them to benefit from the smart power revolution, accessing smart tariffs

and making money by supporting the development of a reliable, cost-effective, low-carbon electricity system. We also hope it will provide a boost to the solar installation market, which has been hit by cuts to Feed-in Tariffs."

Customers will typically benefit by around £350 a year in electricity savings from their solar panels and battery and from Feed-in Tariff payments. They will also receive £50 annual payments for making their battery capacity available through Moixa's innovative GridShare aggregation platform to provide services that make the electricity grid more efficient, greener and cheaper to run, such as balancing demand and reducing the need for back-up power from coal, oil and gas.

## Tank-on-Tank Cylinder

### Bublshop

Bublshop has launched its Tank-on-Tank Cylinder, a heat pump cylinder designed to allow for a quicker and easier installation.

Bublshop, a leading distributor of high-quality renewable energy products with branches in Dorset and Scotland, has been working with RM Cylinders to design and create an exclusive cylinder that allows for a more efficient installation of any heat pump system.

The Tank-on-Tank Cylinder is available with either a 180-litre or 210-litre capacity and has a 50-litre buffer tank built in. The cylinder has been created to alleviate the common heat pump installation issue; the key design features include maintaining the system flow and ensure maximum efficiencies are met.

Bublshop originated from an MCS installer background in response to the belief that the industry was lacking a single destination from which customers could buy the whole renewable package.



## ETA biomass boilers

### Innasol

As the sole UK distributor of ETA biomass boilers, Innasol has made new additions to the already extensive product portfolio.

Innasol partners and Plumb Centre customers have access to the brand new ETA PE-K pellet boiler, available in 110kW, 140kW, 180kW, 199kW and 220kW. The reason for these additions is to establish a wood pellet boiler on the market with a power range above 90kW. This enables high temperature output with a standard ETA pellet auger system and therefore offers a considerable price advantage as only one fuel store is needed – a key selling point for this particular boiler range.



## HIT N295 PV module



### Panasonic

Panasonic has announced the launch of its new HIT N295 solar module for Europe. The latest addition to the company's high-efficiency product portfolio is the most powerful sub-1.6m<sup>2</sup> solar panel available on the continent and provides installers with one of the most comprehensive, flexible solar offerings on the market to deliver more power on any roof.

The N295 combines a compact module size and frame thickness with Panasonic's high-performance technology, offering 19.1% panel efficiency. At less than 150cm in length, the N295 empowers European residential solar installers to maximise customers' available roof space by installing an additional module row.

## Integrated renewable energy solution

### The Zero Carbon Solution & Vaillant

Renewable energy system developers the Zero Carbon Solution and Vaillant, the world's leading heating technology manufacturer, have formed a new partnership to create an industry-leading renewable heating system for low and zero carbon property developments.

Vaillant's ground source heat pumps are the first to feature an inter-seasonal heat store known as the Earth Energy Bank, patented by the Zero Carbon Solution. The innovative technology captures thermal solar energy for use all year round, giving an environmental impact rating for CO<sub>2</sub> emissions >95. Unlike traditional ground source systems, the heat pumps do not require long trenches or deep boreholes, making them cheaper and easier to install – especially in dense housing. The technology was showcased at the Energy 2016 exhibition, part of UK Construction Week, where graphics, models and animations demonstrated how it works and where it is located within the home.





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# Hybrid water heating system with PV battery storage

**A**s part of a reference project in Borken, Germany, my-PV GmbH has integrated its electric hot water preparation system into an existing photovoltaic battery system created by SMA Solar Technology AG.

Installing the AC ELWA-E system resulted in a system with a hybrid storage that can increase self-consumption of self-generated electricity by up to 100%. AC ELWA-E is the newest member of my-PV's ELWA product line and is available with immediate effect.

Austria-based my-PV has developed the alternating current model AC ELWA-E specially for smart home systems with integrated battery storage. The heating element is infinitely variable from 0 to 3,000 watts, adjusts its output to the power surplus once a second, and thus reacts very quickly. AC ELWA-E is integrated into the facility management system via Ethernet and has a standby consumption of less than 1.5 watts.

SMA-employee Manuel März was the beta-tester for this particularly flexible energy supply for one-family homes. A grid-connected photovoltaic unit with connected battery storage has been supplying his house in Borken with power since 2014. The building is heated using an air-to-water heat pump.

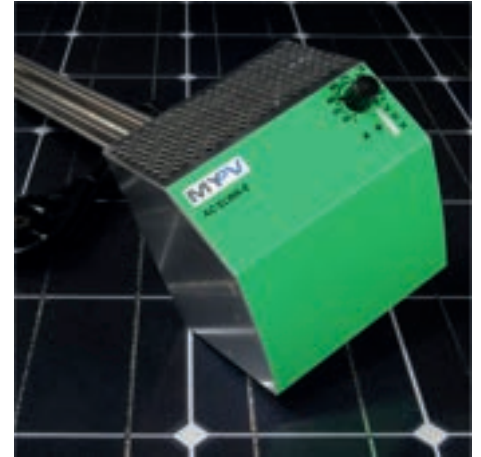
In spring 2016 März upgraded the system to include an AC ELWA-E developed by my-PV.

The complex system is controlled by an SMA Sunny Home Manager. The photovoltaic plant first covers the current own power requirement and then charges the battery. The rest of the solar power then heats water for the heating system via the AC ELWA-E. Now that the photovoltaic unit not only supplies the house with electricity but also with heat, the heat pump is only used to generate energy as a last resort.

"Thanks to the AC ELWA-E I was able to deactivate my heat pump completely during the summer months. That means a longer service life for such sensitive technology," März said of the advantages of the system.

Dr Gerhard Rimpler, CEO of my-PV GmbH, sees the advantage of AC ELWA-E over an auxiliary battery storage especially in terms of price. "The cost of AC ELWA-E as additional storage capacity is nothing compared to the present cost of batteries," he stated. On top of that, an existing system can be expanded with little extra effort.

Manufacturer my-PV GmbH is based in Neuzeug, Austria, and was founded in 2011 by former managers of a solar inverter manufacturer. The founders have worked in



solar electronics and solar heating for over 20 years. This experience led them to invent the DC ELWA (ELWA stands for ELectric WATER heating) for heating water using photovoltaics, which was successfully positioned on the market in 2014.

Last year saw the launch of the AC model AC ELWA, which converts excess electricity from grid-connected photovoltaic units into heat. AC ELWA-E is also available with immediate effect and, in combination with battery systems, commercially available inverters and energy management systems, it enables perfect management of excess energy.

# REA announces new energy storage event

**E**nergy Storage and Connected Systems will bring together key industry figures on the 7th and 8th February 2017 to focus on the future of energy storage in the UK.

The event will cover practical examples of storage that are currently being deployed and how they integrate into a broader network of connected systems, including smart buildings, grids and electric vehicle infrastructure.

Taking place in London at Olympia Central, Energy Storage and Connected Systems is a new event brought in partnership with the REA by Reed Exhibitions, the organisers of All-Energy. The event, conference and exhibition, says it will make the logical connection for energy storage, EVs and renewables, and the smart technology systems that bring them together.

Including a two-day conference and exhibition, this new event will focus on what the UK is doing today in the energy storage market with examples of real companies, real business, happening now, and look at the UK's incredible future opportunities.



# Good news for EVs and energy storage costs as new technology boosts battery storage capacity by 50%

**T**he Energy research Centre of the Netherlands (ECN) has developed a new technology that increases the storage capacity of rechargeable batteries by 50%. With this technology, the range of electric vehicles (EVs) can be increased, batteries in smartphones, laptops and other electronic devices will last longer, and the costs of sustainable energy storage will decrease.

To commercialise the new technology and attract investors, entrepreneurs Christian Rood and Gabriel de Scheemaker founded LeydenJar Technologies BV, named after the famous Leyden Jar of 1746, the precursor of the battery. Having obtained funding for the first year, the start-up company is already having discussions with large international battery manufacturers and wants to open a demonstration plant in 2018.

The new technology replaces the traditional graphite anode with a pure silicon anode, increasing the storage capacity of this component of the lithium-ion battery by a factor of 10 and that of the whole battery

by up to 50%. The problem with silicon is that it expands when the battery is charged and becomes three times larger, which can make silicon layers brittle and cause the battery material to fall apart. ECN applies the silicon in columns onto copper foil using a plasma-based nanotechnology, thus creating enough space for expansion and allowing the battery to remain stable. The layer eventually needs to be 10 microns thick for commercial application, which is ten times thinner than a sheet of paper.

ECN researcher Wim Soppe discovered the material 12 years ago, when he was developing thin-film solar cells. "The material was unsuitable for solar cells, but we found that the technology is extremely promising for lithium-ion batteries. An nice example of how a failure can turn into a success," he said.

Sjoerd Wittkamp, Technology Transfer Manager at ECN, said tremendous effort is put into research worldwide to improve lithium-ion batteries, and a breakthrough is claimed every few weeks. "These discoveries usually concern materials that can only be produced

in a laboratory environment on a very small scale," he added. "What makes the invention of ECN so promising is that the technology for mass production of this material is already within reach due to its similarity to an existing production process for solar cells. We believe that this gives us a unique advantage. Through the founding of LeydenJar Technologies, we will transfer this technology to the market and create a fit between the battery industry and venture capital investors."

"Given the widespread use of Li-ion batteries, the company focuses its efforts on three market segments," said co-founder Christian Rood. These segments are EVs, consumer electronics and renewable energy storage. The goal is to supply the technology to large battery manufacturers.

"In our future demonstration plant, we want to produce silicon anodes for our first clients and demonstrate that this technology is competitive when mass-produced. In other words, we want to demonstrate that a better battery can be produced for the same amount of money."



# The future is battery-powered

**R**enewable energy technology never stands still, according to Harriet Murray-Jones, energy and renewables specialist with Harrison Clark Rickerbys, a leader in the energy field, with battery storage at the forefront of advances.

Battery storage will enable energy from both renewable and non-renewable sources to be stored and used when it is needed, conquering the problems of fluctuations in supply and demand.

Murray-Jones, whose energy expertise has gained the company its first ranking in the Legal 500, the prestigious legal directory of the country's best lawyers, said: "Over the last few years there has been much discussion on battery storage and the potential ability of storage to contribute to a smart energy network. There can be no doubt that there is a great need for a secure and flexible smart energy network. We are all acutely aware of the current grid constraints and welcome any move towards addressing the way we use and manage energy.


"Battery storage covers a range of battery technologies, from compressed air and pumped hydroelectric to flywheels and thermal storage. There are also different ways in which it can be deployed – it can be placed with an existing project or a standalone battery project, or it can be used in what is known as 'behind the meter' projects to help high energy users to manage their energy needs at source."

"These projects are starting to move ahead to commercial deployment, so the situation has moved beyond the theoretical to a practical application. It is now a question not of whether there will be battery storage but on what scale?"

"Just as the summer's Enhanced Frequency Response (EFR) auction showed, companies taking part have to be very price-sensitive, as both technology costs and energy storage costs are falling; we are also seeing a diverse range of projects becoming viable. I am working with both developers and landowners and each project really does have an individual profile, so it is not a case of one size fits all."




Harrison Clark Rickerbys has 400 staff and partners at offices in the Wye Valley, Hereford, Cheltenham, Worcester, Birmingham and the Thames Valley, providing a complete spectrum of legal services to business and private clients, regionally and nationwide. The firm has highly successful teams specialising in market sectors, including agricultural and rural affairs, health and social care, education, defence, advanced manufacturing and construction.



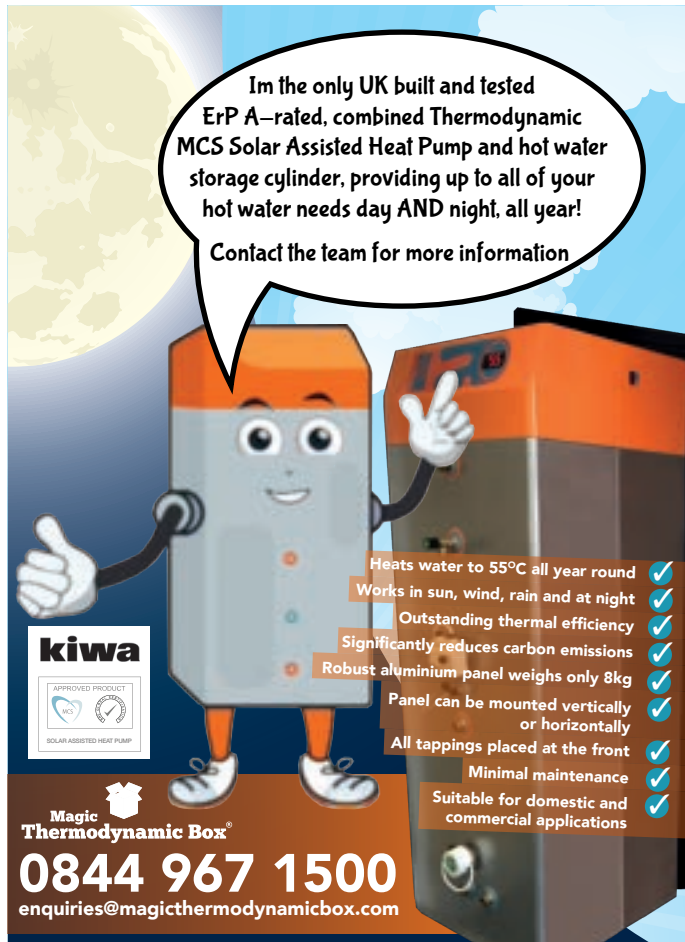
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# Study reveals low cost of integrating solar into power system

**A** new report for the Solar Trade Association (STA) for the first time quantifies the cost of integrating solar into the UK power market, both today and in a 2030 scenario where solar provides over 10% of annual UK electricity.

Concerns are sometimes expressed about the variability of solar power (which generates according to daylight intensity) imposing costs on the system; the need for 'back-up' is cited as a disadvantage of solar power by critics of renewable energy. There has been uncertainty about what these costs are today and will be in the future. However, the Aurora analysis shows that today the cost of integrating solar into the power system, including 'back-up', is negligible at only £1.30 per MWh, or less than 2% of the costs of solar today.

STA Chief Executive Paul Barwell said: "The tremendous growth in local, clean generation has challenged the old power supply model. Yet Ministers can be reassured that the rapid expansion in solar power over recent years has been absorbed efficiently and affordably by the system."

The research shows that more than tripling solar generation to 40GW (over 10% of annual UK electricity) would increase the costs of managing variability modestly, to a maximum of £6-7 per MWh.

This clarity on the costs of integrating large volumes of solar, together with further expected cost reductions in solar installations, supports the STA's and other analysts' expectation that solar can be the lowest cost form of energy generation in the 2020's.

However, strikingly the modelling shows integrating solar into a more decentralised, flexible, 'smarter' power system, including batteries, actually delivers more benefits than costs to the system. High battery penetration combined with high solar penetration reduces the cost of variability by £10.50 per MWh, resulting in a net £3.70 per MWh benefit. This is because solar combined with batteries allows output to match demand requirements exceptionally closely and requires only a small amount of back up.

The report also evaluates the portfolio effort of combining solar and wind in the energy system. The model follows the 'High Renewables' pathway set out by the Committee on Climate Change as a generation mix consistent with the UK's 2030 carbon budgets. This requires 40GW of solar and 45GW of wind, enough to power 55% of the UK's electricity system in 2030. The cost impact of solar on the system falls by 25% in this scenario.

Dr Benjamin Irons, a Director at Aurora Energy Research and lead author of the

report, said: "Recent spectacular technological progress in renewable power generation puts the promise of cheap, low carbon power within reach. The challenge of integrating large volumes of renewables into the network in a way that provides reliable power to consumers and an attractive market for complementary generation technologies is the 'last frontier' in delivering the power system of tomorrow. Our analysis shows that such integration is possible and surprisingly affordable: the UK could more than triple the amount of solar power on the system by 2030, with associated costs of integration and back up so low as to be dwarfed by the enormous cost savings anticipated from falling solar prices over the same period."

Angus MacNeil MP, Chair of the Common's Energy and Climate Change Committee, said: "This welcome research puts numbers and maths behind the variability of solar power. It gives a concrete understanding of what solar has to offer compared to other technologies. Combined with reducing capital costs solar is going to be as cheap a source of power as you'll find anywhere."

Lord Adair Turner, Chair of the Energy Transitions Commission, said: "Aurora's report confirms what an increasing number of analyses are now telling us – that we can build electricity systems with high shares of renewables such as solar and wind, using lower cost batteries, other storage technologies and demand management to deal effectively with intermittent supply. We should not be holding back from further renewables investment out of fear that we can't keep the lights on."

Paul Barwell, CEO of the STA, added: "Britain is concerned about its international competitiveness as it exits the EU and moves to ratify the Paris Agreement on climate change. The good news is backing solar power, the UK's most popular energy technology, looks set to enhance UK competitiveness – so there need be no trade-offs."

The variability cost of integrating 40GW of solar is further cut by 55% to £3.10 per MWh if Hinkley C isn't replaced, because the inflexibility of nuclear power also imposes costs and reduces the economics of flexible generation.







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## Gloucester Cathedral takes steps for Church of England's 'Shrinking the Footprint' campaign

Gloucester Cathedral, one of the best known cathedrals in the UK, has commissioned local business Mypower to install 150 solar panels on the nave roof of the historic 11th century building.

In the modern era, the cathedral is famous as a location for three Harry Potter films, a Doctor Who Christmas special and an episode of Sherlock.

The solar panel installation is starting in October and will allow Gloucester Cathedral to reduce its energy costs by 25% and help deliver the Church of England's ambitious 'Shrinking the Footprint' campaign, which aims to reduce its carbon emissions by 80% by 2050.



## RES completes its first UK energy storage project

RES (Renewable Energy Systems) has successfully completed its first UK-based industrial-scale battery storage facility at a 1.5MW solar park south of Glastonbury in Somerset.

RES has delivered the battery energy storage system (BESS) under an Engineering, Procurement and Construction (EPC) contract for Western Power Distribution (WPD) as part of a project to explore the provision of ancillary services to a distribution network operator from an embedded BESS.

A leading global renewable energy company, RES has pioneered energy storage projects in the US and Canada and is now delivering its energy storage expertise at projects across the UK. The 310kVA/668kWh battery storage system RES has delivered for WPD, at a British Solar Renewables (BSR) solar park, is one of the first such projects to be built under a fully wrapped EPC contract in Europe. The combined solar-storage project is connected to WPD's South West 11kV network, and the BESS will be operated using RESolve, RES's storage control and dispatch system, which will provide 24/7 management of the battery's operation.

The completion of RES's first energy storage project in UK solidifies RES's

leadership in the global energy storage sector, as reported in Navigant Research's Leaderboard Report, and takes RES's total contracted energy storage portfolio to 143.6MW/92MWh, alongside more than 200MW in development.

Tim French, RES's Head of Projects for New Technologies, said: "Completing our first battery storage facility in the UK marks an important milestone for RES. We've been able to use our global energy storage expertise to great effect in successfully

designing and building this project for WPD and delivering it ahead of schedule.

"We recognise the significant potential energy storage brings through increasing the efficiency and cost-effectiveness of grid operations without the need for public or Government subsidy. RES is very well placed at the forefront of the rapidly expanding UK storage market, which will play a vital role in the UK's transition to a low carbon future at least cost to consumers."



## GIB invests £28m in new energy-from-waste plant

UK Green Investment Bank plc (GIB) has committed £28m of debt finance to a new £142m energy-from-waste (EfW) plant at Millerhill, near Edinburgh, Scotland. GIB joins a lending club that includes Investec, Siemens Bank and Credit Agricole.

The 14.1MW facility is expected to treat up to 155,000 tonnes of waste every year once complete. The waste, sourced mainly from local residences, will be pre-screened in a mechanical treatment facility to remove recyclable material before entering the energy recovery process.

The plant is forecast to generate approximately 94,000MWh of electricity annually. It is anticipated that it will avoid greenhouse gas emissions equalling 30,000 tonnes per annum, equivalent to removing 13,800 cars from the road for the lifetime of the project.

The plant will also be combined heat and power (CHP)-ready, meaning it has



the potential to supply excess heat from its generating operations to nearby homes as well as local businesses.

Recycling and waste management company FCC Environment (UK) has been appointed to design, build and operate

the plant by Zero Waste: Edinburgh and Midlothian, a joint venture between City of Edinburgh Council and Midlothian Council. FCC already operates similar facilities in four locations in the UK. Construction will commence immediately.

## Whisky power as bio-energy transforms distillery sector

The successful on-site bio-energy plant commissioned one year ago by Clearfleau (leading British provider of on-site anaerobic digestion plants) at Diageo's Glendullan distillery in Speyside, Scotland, is helping lead the Scotch Whisky industry's drive for environmental sustainability and carbon reduction at distillery sites. On-site bio-energy generated from co-products is supplying energy for whisky distillation.

The plant is delivering a 25% reduction in fossil fuel energy demand at the distillery, saving Diageo significant costs and reducing its carbon footprint by 1,000 tonnes of CO2 per year. On-site digestion technology is boosting the circular economy in Scotland's distillery sector.

Twelve months' results show on-site anaerobic digestion (AD) at the Glendullan distillery at Dufftown, in the heart of Speyside, is converting approximately 1,000m<sup>3</sup> per day of malt whisky distillery co-products into valuable renewable energy. This is about a million cubic metres of biogas per year – producing 6,000MW hours of thermal energy for the distillery.

Diageo and Clearfleau collaborated closely in developing the bio-energy plant at Glendullan and the initial plant at the nearby Dailuaine distillery that has been operational for over three years.

Each on-site plant comprises a high-rate digester, specifically designed to handle liquid distillery co-products, followed by aerobic treatment for water clean-up.

The AD plants reduce the incoming COD load by over 95% and minimise further treatment required for the discharge of cleansed water to nearby

rivers. It will help Diageo meet the Scottish Environment Protection Agency's new plans for enhanced resource use – achieving low carbon emissions, improved materials use and energy savings. It will also enable local farmers to replace fossil-fuel-derived fertiliser with nutrient-rich bio-solids.





# Knowledge: Case studies

## ASHP

**What:** Property developers combine insulation with air source heat pump

**How:** ASHP delivers cost-efficient heat to underfloor system

**Result:** Efficiency measures add £10k to property values

## Insulation and air source heat pump improve chicken shed conversion

A former chicken shed has been converted into small country homes with the clever use of insulation and an air source heat pump.

Solihull-based Ardenvale Ltd chose to use products from the Actis Hybrid range when it converted the 10,000-square-foot 1940s one-time hen house into a selection of one and two bedroom cottages.

Using insulating vapour control layer Actis H Control Hybrid in the walls gave the builders an extra 3-4cm of floorspace at every wall – which, across 13 houses, enabled them to add an

additional £10,000 to the overall asking price for the development.

The firm chose Actis products – insulating vapour control layer H Control Hybrid for the walls and 45mm honeycomb style insulation Hybris, H Control Hybrid and multifoil TS10+ for the roofs – for their combination of thermal efficiency and thin volume. This enabled them to maximise floor space and ensure sufficient headroom in the eaves. The properties also benefit from underfloor heating provided via an air source heat pump.



## GSHP

**What:** Eco-friendly home opts for heat pump technology

**How:** Kensa GSHP supplies sustainable source of heating and water

**Result:** Project is eligible for RHI and cuts energy bills

## Kensa GSHP helps ultra-modern eco home

In 2015 Jason Harris, Director of East London based architectural practice T-Space, designed and built an ultra-modern, eco-friendly home. He wanted the 550m<sup>2</sup> house to be as self-sufficient as possible and was keen to install a renewable heating system rather than using the gas network.

He approached Kensa partner installer Ground Sun who suggested that a ground source heat pump would provide a sustainable and efficient source of heating and hot water. Ground Sun also advised that the installation would be eligible for the domestic Renewable Heat Incentive (RHI), earning quarterly payments from the Government for seven years to more than offset the cost of the initial investment.

Ground Sun specified a 20kW Kensa Twin Compact ground source heat pump. Brian Connell, Director of Ground Sun, said: “Kensa manufactures the highest output single phase ground source heat pumps on the market, which is really useful for large domestic jobs such as this one. Also, Ground Sun enjoys a good working

relationship with Kensa and appreciates the support offered during the installation process.”

The heat pump is installed in a basement plant room. Smart energy meters complement the system and controls are kept to a minimum, consisting of a time clock and just four thermostat zones. It was felt preferable that the heat pump be allowed to run for longer periods at a lower level to achieve optimal efficiency, instead of cycling on and off with the demands of multiple controls. The fine tuning and long term balancing for each room is done by hand at the manifold.





**BIOMASS**

**What:** University goes for low-carbon energy

**How:** Woodchip biomass boiler will deliver 1MW of energy

**Result:** Hot water distributed across the campus through district heating network

## Vital Energi to deliver sustainable energy for new Northampton campus

The University of Northampton's new Waterside Campus will use sustainable technology for heat while dramatically reducing its CO2 output.

The university has employed sustainable energy experts Vital Energi to deliver the energy solutions for its new campus, opening in 2018.

The contract will see Vital Energi deliver an energy centre that will use woodchip biomass and gas to heat water for all the buildings and student residences on the 58-acre site. In the

process it will save over 1,000 tons of CO2 in the short term, rising to 2,200 tons a year following the introduction of a CHP engine.

The energy centre will accommodate a 1MW biomass boiler, four 4MW gas-fired boilers and a 120m<sup>3</sup> thermal store. The biomass boiler, which weighs 8,000kg, will create low-carbon hot water, which is distributed through the district heating network to provide heating and hot water for the buildings on campus.



**SOLAR PV**

**What:** Community project celebrates one-year milestone

**How:** 392 solar panel array powers local sewage treatment plant

**Result:** Water company passes on energy savings to lower customer bills

## Community solar powers sewage plant

A celebration was recently held to mark the first anniversary of community-owned renewable energy being used to treat sewage from Bodmin.

Wadebridge Renewable Energy Network (WREN), South West Water (SWW) and Regen hosted the event at the 100kW solar array, which partially powers Nanstallon sewage treatment works. It also helps protect SWW from energy price rises, keeping customer water bills low.

The array, constructed under contract by CleanEarth Energy Limited, a company based in Wadebridge, consists of 392 panels and covers half an acre of grade 3b land right next to the treatment works.

Since it was installed, it has supplied the treatment works with approximately 110MWh of solar power; around 10% of the energy used by the site during that period.



### Large heat pumps can become zero carbon by 2050

**I**ndustrial-sized district heat pumps, which draw warmth from the air, rivers, lakes, the sea and the ground, are expected to play a key role in achieving COP21 carbon reduction targets because “they are the only proven, viable technology capable of delivering zero carbon heat on a large scale,” attendees at The Future of Thermal Energy Conference heard.

Hosted at Warwick University in October, the conference emphasised the importance of the UK government’s new focus on decarbonising heat. Jonathan Graham, Head of Policy for The Association for Decentralised Energy, differentiated between technologies that save CO2 in the medium-term such as Gas CHP and those that fully integrate with the grid’s natural decarbonisation progression, making heat pumps a long-term and potentially zero carbon solution.

For Trevor Whittaker of Aqualor, who took installation and operational costs into account, heat pumps are also a financially sound solution: “Heat pumps have a higher installation cost than a gas CHP but much lower operational costs at only 4% of capex and will last well beyond 20 years.”

Nicky Cowan, Technical Engineer from Star Renewable Energy, added: “Proven renewable heating technologies that avoid burning gas, particularly large district heat pumps, are becoming one of the most talked-about topics for governments and increasingly recognised as the best way to combat climate change. We have shown efficiencies far in excess of those used to model energy systems.”

“According to the Committee on Climate Change, heating may have to almost fully decarbonise if the UK is to hit its long-term goal of an 80% reduction in emissions by 5050”.

Thomas Nowak, Secretary General of the European Heat Pump Association, said: “We know that heating and cooling are responsible for 50% of the energy demand used in Europe, today. We also know that heat pumps can efficiently provide both at the same time. So the only logical conclusion is that heat pumps become a central part of the decarbonisation of the system in order to realistically deliver COP21 carbon targets.”

### New partnership set to boost number of low and zero carbon UK homes

**M**ore new homes across Britain could become energy self-sufficient thanks to a new partnership between renewable energy system developers, The Zero Carbon Solution and Vaillant, the world’s leading heating technology manufacturer.

The companies have joined forces to create an affordable and self-supporting heating system that is easy to install, and compatible with a wider range of property sizes than ever before.

Vaillant’s flexoTHERM and 3kW geoTHERM mini heat pumps will form part of the industry-leading solution, by using an inter-seasonal heat store known as the Earth Energy Bank, patented by The Zero Carbon Solution. The technology uses an array of photovoltaic-thermal solar panels to collect both thermal and electrical energy that can be stored and used all year round. The system then utilises a Vaillant ground source heat pump to extract the heat from the earth but, unlike traditional ground source systems, doesn’t require long trenches or deep boreholes, making it ideal for properties with limited space

The simple installation process and affordable technology mean that the heating system is ideal for higher density housing developments. The Zero Carbon Solution also project manages the installations, bringing together renewable technology providers, architects and building consultants,

while Vaillant installers provide the plant room equipment.

Michael Goddard, founder of The Zero Carbon Solution, said: “We’re thrilled to be working with Vaillant. Our collaboration means that developers are now being offered a more affordable renewable heating system that is easy to install and compatible with a greater range of new build properties. Our technology is unrivalled and we’re already delivering on our ambition to become the default renewable energy system provider for new builds.”

John Bailey, Commercial and Renewable Systems Director at Vaillant, commented: “We were delighted to partner with The Zero Carbon Solution to develop a truly innovative heating solution for house builders. The system has been specifically designed to inspire commercial builders who are looking for new ways to incorporate the ultimate in renewable energy efficiency into their properties, whatever the size.

“We encourage anyone who is interested in finding out more about what the next generation in renewable technology can do for them, to get in touch with The Zero Carbon Solution.”

The Zero Carbon Solution is aimed at commercial builders looking to incorporate renewable technologies within their projects. First installed in the Solar House in 2013, the system has since been included in homes of all sizes.



## Huge increase in renewable heat output for Scotland

**N**ew figures show 2015 saw the biggest rise in renewable heat output in Scotland since records began in 2008.

The Scottish Government aims for 11% of non-electrical heat demand to come from renewable sources by 2020.

The figures, published by the Energy Saving Trust on behalf of the Scottish Government, show renewable heat output increased by 1,100GWh over the course of 2015, meaning Scotland generated 5.3-5.6% of its non-electrical heat demand from renewable sources – up from 3.8% in 2014.

Stephanie Clark, Policy Manager at Scottish Renewables, said: “This shows that progress is being made towards our 2020 target – a vital goal when heat makes up more than half of the energy we use in Scotland.

“If we are to continue this positive progress it’s important that the UK Government clarify the future of the RHI, through which technologies like heat pumps are supported, and that public awareness of renewable heat solutions increases.”

## The pivotal role of heat networks in decarbonising UK homes

**H**eat networks are good value and crucial to decarbonising domestic heating in the UK, according to a new report by influential think tank Policy Exchange, ‘Too hot to handle? How to decarbonise the way we heat our homes’.

The report says emissions from domestic heating have fallen by 20% since 1990, compared to 50% in the power sector, and suggests a radical overhaul of Government heat strategy.

One proposal is to increase the roll-out of heat networks, which currently supply around 1% of households but, Policy Exchange says, could serve 10-20% or more by 2050.

The report calls for Ofgem to develop a bespoke regulatory framework for heat networks and for the Government to do more to increase their financial attractiveness and de-risk investment – echoing the call by the Association for Decentralised Energy (ADE) for a new regulatory investment framework.

Ian Allan, Head of Research and Development for community heating specialist Switch2 Energy, said: “This is a very interesting report that helps to bring heat out of the energy policy shadows and highlights the huge contribution that heat networks can

make to reducing the UK’s carbon footprint in the most affordable way possible.

“Although the Heat Trust is making an excellent contribution to raising industry standards, it is a voluntary scheme, and Policy Exchange is right to call for greater regulation. However, as the report states, this must be proportionate to scale and differentiate between large heat networks, such as district heating, and smaller building-level heat networks, such as community heating.

“Heavy ‘Ofgem’ legislation may be too rigid for small community heating schemes and could deter their growth, at least in the short term. Policy must also recognise the fact that many heat network operators don’t have end-to-end responsibility for schemes, preferring to deliver heat to the bulk meters and then hand over to landlords or local community.

“The report recommends moving focus away from specific technologies, like electric heat pumps, which current Government heat strategy favour. In the case of heat networks, it’s important to remove barriers and permit developers to choose their own heat source, whether this be gas boilers for small community heating schemes, CHP, biomass, or others.”

## Most small firms want renewable energy

**A** significant majority of small and medium-sized businesses (SMEs) want their energy supplier to be more committed to renewables, according to a new report looking at how the SME sector regards energy supply.

The report, commissioned by Haven Power, revealed that while 72% say they would like energy suppliers to be more committed to renewables, only 11% would rate their current energy supplier as excellent when it comes to renewable energy support and options.

Much of the energy supply sector is failing to meet SMEs’ demand for more renewables and this comes against a general backdrop of high dissatisfaction with suppliers among SMEs:

- As many as 73% of SMEs label value for money as a main priority (up to 94% for SMEs with 5-25 employees), and yet just 23% believe they are receiving an excellent deal.
- 71% of SMEs agree that it should be simpler

to switch supplier. One in five who tried to switch didn’t end up with a new supplier.

■ The third factor likely to stimulate a switch (after price and service) is the offer of renewable electricity. In fact, 22% told researchers they would stay late at work to switch suppliers if they could purchase a completely clean energy product. For the largest SMEs (101-250 employees), this rises to 28%.

■ In addition, 26% cite that support in being more energy efficient is something that they look for in an energy supplier.

Jonathan Kini, Chief Executive of Haven Power, said: “That so many SMEs are dissatisfied with their existing energy supplier is perhaps unsurprising, but the sheer scale of the discontent revealed in this report remains shocking. SMEs want more from their supplier and a commitment to renewable energy is one of the demands they are pushing for. This suggests there is some fundamental change

happening, and we in the energy sector need to respond to it by not only helping SMEs reduce their energy usage but also being able to supply 100% renewable energy.

“The fact that only 21% of respondents believe their supplier is completely committed to renewable energy with almost a third saying their supplier is either not very committed or they are not sure they have a renewable option shows a huge gap in the market.”

The report comes as Haven Power prepares to launch a new initiative around its Ipswich headquarters to help SMEs switch to more renewable energy and become more sustainable. Suffolk has taken the lead in driving renewables usage following the formation of the Creating the Greenest County Partnership in 2007. Many businesses in the area have taken advantage of the 100% renewable electricity product from Haven Power, but it is still a small proportion of their total customer base.



## Figure it out

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

	52 week high	52 week low	July price	Current price	
Drax Group (DRX)	451.30	205.60	350.40	307.70	↓
Good Energy Group	255.13	199.00	215.00	222.00	↑
Intelligent Energy	151.50	7.90	9.48	7.90	↓
ITM Power	36.45	12.09	16.44	24.25	↑
Leaf Clean Energy	43.00	22.00	41.75	43.00	↑
PV Crystalox Solar	13.72	7.78	10.94	13.72	↑
Rame energy	11.00	5.75	Suspended		
REACT Energy	9.00	2.00	5.00	3.80	↓
Renewable Energy Holdings	2.69	0.70	Suspended		
Rurelec	4.60	0.50	0.85	1.15	↑

### Generation tariffs for solar PV

Tariff band	FiT rate (p/kWh) from 01/07/16 - 30/09/16
< 10kW	Higher rate 4.18
	Middle rate 3.76
	Lower rate 0.57
10 - 50kW	Higher rate 4.39
	Middle rate 3.95
	Lower rate 0.57
50 - 250kW	Higher rate 2.03
	Middle rate 1.83
	Lower rate 0.57
250 - 1000kW	1.69
> 1000kW	0.57
Standalone	0.51

\* 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

### Generation tariffs for non-PV technologies

Technology	Band (kW)	Tariffs (p/kWh)
Hydro	< 100kW	7.65
	100 - 500kW	6.12
	500 - 2000kW	6.12
	> 2000kW	4.43
Wind	< 50kW	8.33
	50 - 100kW	6.08
	100 - 1500kW	3.92
	> 1500kW	0.83

(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
<b>Dual mode system 1</b>						
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
<b>Dual mode system 2</b>						
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)	< 200kWth	Tier 1: 3.10 Tier 2: 0.82	20
Medium biomass	Solid biomass: Municipal solid waste (inc CHP)	200kWth and above, < 1000kWth	Tier 1: 5.24 Tier 2: 2.27	20
Large biomass	Solid biomass: Municipal solid waste (inc CHP)	1000kWth and above	2.05	20
Small ground source	Ground source heat pumps, water source heat pumps, deep geothermal	< 100kWth	Tier 1: 8.95 Tier 2: 2.67	20
Deep geothermal			5.14	
Solar collectors	Solar collectors	< 200kWth	10.28	20
Air source heat pumps	ASHPs	All	2.57	20

(Source: OFGEM)

## Number of MCS registered installers per technology

Technology type	Cumulative	Registered Sept 16
Solar PV	1,838	13
Biomass	547	0
Air source heat HP	979	7
Ground source HP	683	2
Solar thermal	755	1
Small wind	54	0
Total	2,519	23

(Figures supplied by Gemserv)

## Number of MCS registered installations per technology

Technology type	Cumulative	Installed Sept 16
Solar PV	883,581	4,461
Biomass	17,065	51
Air source HP	49,539	466
Ground source HP	13,594	92
Solar thermal	8,683	64
Small wind	5,061	2
Total	955,615	4778

## Domestic RHI deployment

Technology	Accreditations (Aug 31)	% of total
ASHP	23,724	47
GSHP	7,400	15
Biomass	11,939	23
Solar thermal	7,864	15
TOTAL	50,927	100

(Source: DECC)

## Domestic RHI tariffs

Technology	RHI rate (from 1 July) (p/kWh)
ASHP	7.51
Biomass boilers	4.68
GSHP	19.33
Solar thermal	19.74

(Source: DECC)



*Allister Marsh, Director of biomass and multi-fuel stove experts The Centre for Green Energy*

## The future is biomass

Home heating as we know it could be a thing of the past, says Allister Marsh, director of biomass and multi-fuel stove experts, The Centre for Green Energy. The HETAS approved installer talks about the benefits of biomass and its rising popularity among homeowners.

Allister's career in biomass began when he moved to a remote rural cottage with his family 14 years ago and found the property was without heating. "I have always had an interest in renewable technology," says Allister. "Living close to Kielder, the largest manmade forest in Western Europe, it seemed logical for us to look at woodfuel. As we researched biomass and its low carbon qualities, we made a decision to avoid oil and gas."

At the time, Allister and his wife were running a family building company and employing stone masons, joiners, electricians and plumbers, who all helped with the installation of their biomass boiler. "My wife and I realised we had the skillset to undertake all aspects of the work involved in biomass, so it was quite a simple transition for the business."

From installing one or two boilers in the first year, today The Centre for Green Energy installs a variety of biomass appliances every week. The business covers a significant patch of Northumberland, Cumbria, North East of England and the Scottish borders and employs six biomass experts, all of whom have undertaken HETAS training. Allister wanted to ensure his team met the right standards to offer the best customer service. He comments: "Customers look out for HETAS' three tick logo and it reassures them that we are a reputable business they can trust. For us, it's

good to be working in a regulated but helpful environment and we're proud to be associated with an organisation that is all about raising industry standards."

Allister prides himself on helping customers find the right appliance for their home. This involves surveying the property for a suitable location and quoting for the installation and any other ground or building work. "It's a complete service that exceeds just the boiler installation. We're with the consumer every step of the way to make sure they are 100% happy with their stove or boiler," he says. "We also advise on fuel supply and servicing."

He adds: "Biomass covers such a range of appliances. From hand-feed, manual log boilers, to large fully automated appliances that can heat schools and hotels, there is not really a situation where one size fits all. The route to a satisfied customer is matching them to the correct appliance to suit their lifestyle and their budget; this is very different to fitting oil or gas boilers where the customer choice is down to the manufacturer, because they're all white boxes."

Allister has noticed an increase in popularity for biomass as a result of the Government's Renewable Heat Incentive with consumers getting the "feel-good factor" for making a choice that will make a difference to the future of the environment. He comments: "The combination of Government initiatives and oil and gas prices has had a significant impact on customers' motivation. As energy costs rise we will see a more natural transition of customers from carbon-based fuels to lower carbon alternatives. Some of those low carbon alternatives will be biomass. We are already

seeing people shift more towards integrating technologies. So having solar, PV, biomass all working together on one system that responds to the seasons and people's lifestyles."

Based in the North East, where there are a number of managed woodlands, Allister feels that The Centre for Green Energy is well placed to specialise in biomass. It works with local biomass suppliers that are assured by Woodsure, the UK's only quality assurance scheme. Woodsure partnered with HETAS earlier this year and guarantees that woodfuel meets the right standards, ensuring appliances are working sustainably and efficiently. Allister comments: "In our particular area we have a good supply of wood. It's both logical and low carbon for our business as the fuel has a shorter road journey, as well as the fuel being low carbon itself"

Allister strongly believes that the future is biomass and that other installers should be adding this to their skill set: "It makes sense for businesses and homeowners. Older properties can be difficult to heat as they need higher water temperatures than could be supplied by an air or ground source heat pump. The reality of the future is that if all new housing is well insulated there would be little need for heating, but for now, biomass is the best home heating option. It is low carbon and replaces costly and dirty fuels such as oil and LP gas."

Being part of this movement is something that gives Allister great job satisfaction, but what he loves most about working at The Centre for Green Energy is his location: "Living and working in a rural area I have the very good fortune to travel through one of the most beautiful counties in the country on my daily commute!"



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