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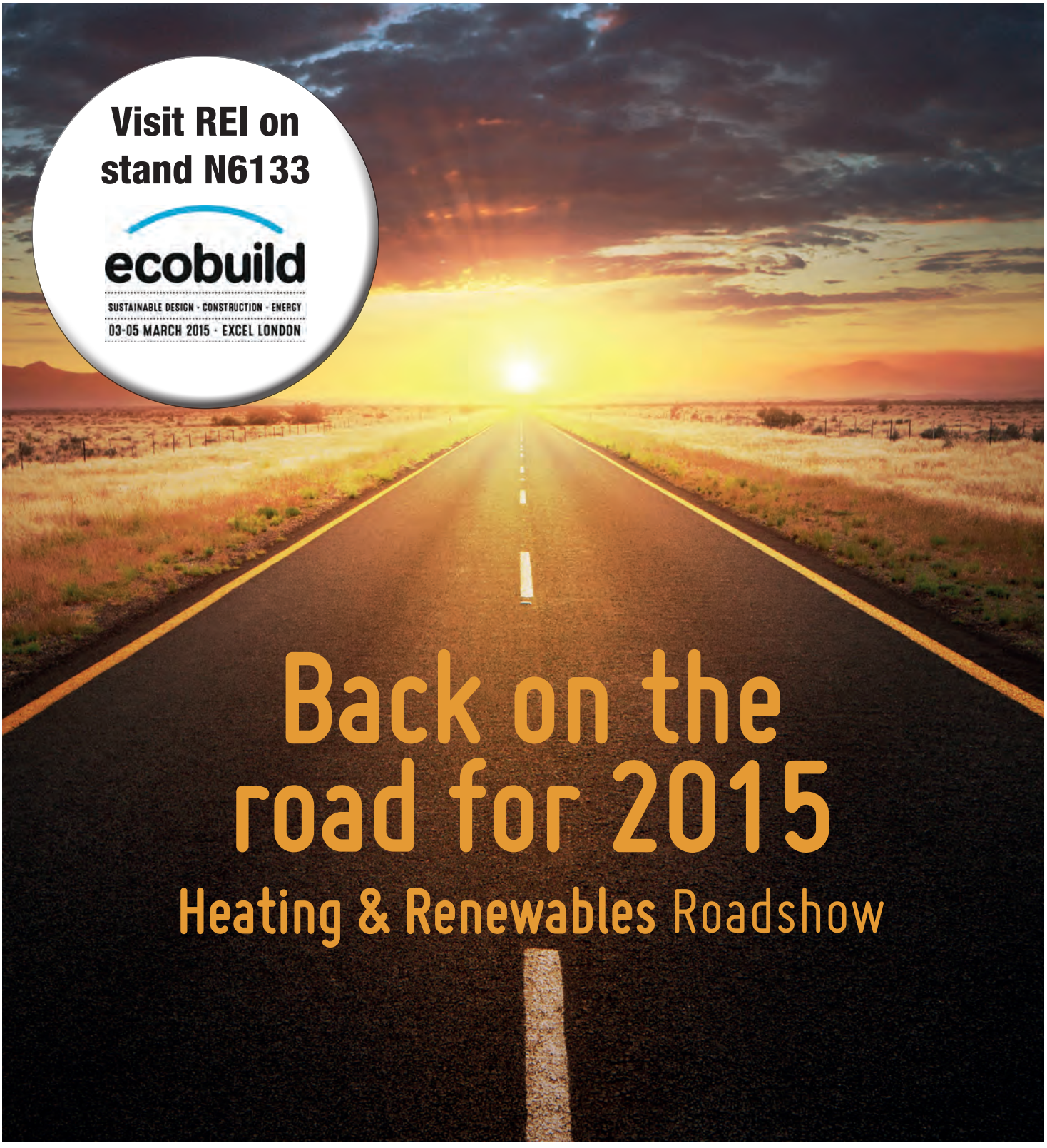

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The great beyond

The start of a new year typically heralds talk of renewed optimism, not least from B2B magazine editors, but does 2015 represent a new dawn for the renewables sector? – sadly not, judging by the evidence.

Perhaps I'm still shaking off a bad case of January blues, but the uncertainty brought on the sector by tumbling oil prices and political manoeuvring from our beloved MPs is difficult to ignore.

Of course the big story for the next few months is the General Election and what its outcome will mean for installers. Can there be a 'greenest government ever' more than once if Mr Cameron retains power, or would Mr Miliband and his coterie put the environment any higher up the political agenda?

The good news is that financial support for renewables looks certain to be maintained for at least the first half of the next parliamentary term, and investment will be forthcoming just as much through economic necessity as via cynical attempts to gain political capital.

Growth in the sector has been one of the few success stories for the coalition in a time of ruthless recession and slow economic turnaround. FiT is working, dRHI is finding its feet and Green Deal has not least demonstrated a strong marketplace for energy efficiency, even if it is the favoured candidate for wholesale change, regardless of the makeup of the next government.

Moving firmly into the present, ISH and Ecobuild are almost upon us – exciting events offering an array of new products and business opportunities ahead. As official media partners, you can visit the REI team on stand N6133 at London's ExCel.

Last but not least, I'd like to welcome four new faces to REI's editorial panel. Messrs Pollard, Sowden, Joyner and Kellett require very little in the way of introductions and I look forward to working with all the panel on a range of interesting projects throughout 2015.

Contents

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"It is perhaps disappointing that the self-proclaimed 'Greenest government ever' has seemingly turned its back on the environment" Neil Schofield, Worcester Bosch p12

Events

The Green Building Roadshow ecoSHOWCASE
10 Feb 2015 Salford City Stadium
http://www.ecoshowcase.co.uk/register/

Solar Energy UK Installer Roadshow
10 Feb Surrey
11 Feb Somerset
12 Feb Manchester
24 Feb Edinburgh
25 Feb Yorkshire
26 Feb Leicester
http://ukroadshow.solarenergyevents.com/

Ecobuild
03-05 Mar 2015 London ExCel
www.ecobuild.co.uk

ISH
10-14 March 2015 Messe Frankfurt
http://ish.messefrankfurt.com/

Sustainability Live
21-23 April 2015 Birmingham NEC
http://www.sustainabilitylive.com/

Heating & Renewables Roadshow
10 September 2015 Ricoh Arena, Coventry
15 September 2015 Westpoint Arena, Exeter
17 September 2015 FIVE, Farnborough
22 September 2015 RHC, Edinburgh
24 September 2015 Event City, Manchester
http://heatingandrenewablesroadshow.co.uk/

Solar Energy UK
13-15 October 2015 NEC, Birmingham
http://uk.solarenergyevents.com/

Don't let the HRR pass you by

Preparations are continuing apace for 2015's return of The Heating & Renewables Roadshow

Travelling to five strategically located venues across the UK; the roadshow will showcase some of the best and most innovative heating and low carbon technologies – making it fully accessible to installers, contractors and specifiers all over the country.

For A&D Publishing (publishers of REI), taking ownership of the roadshow has been a fantastic opportunity to take a winning formula and build on it, making it this year's must-see event.

The Heating & Renewables Roadshow already has great support from a significant range of exhibitors and associations, with stand space almost 100 per cent confirmed.

We recognise the importance of equipping visitors with the necessary knowledge to help to increase profits and improve product specifications, so we are working very hard to develop a comprehensive and stimulating seminar programme. As a key part of this, we have asked a number of major merchants from the worlds of heating and renewables to work with us as knowledge partners – REHAU, St Gobain, Edmundson Electrical and SBS.

This steering committee will ensure the quality of content is as high as possible, addressing all the key industry issues for the coming year. Much of the subject matter will be delivered by the knowledge partners themselves, but keynote sessions will be reserved for government departments and associated trade bodies, such as MCS, SEA and HETAS.

Furthermore, a big part of the roadshow will be the hugely successful awards. Following September's successful ceremony at The Kensington Roof Gardens, all 13 categories have been retained, plus four which are brand new to 2015.

With plans already so advanced, we are holding an exhibitor day at the Ricoh Arena, Coventry on Thursday 05 February to communicate plans and promotion for the show.

This information will follow online and in March's issue of REI including how to register for the roadshow, and how to enter the awards.

SEUK takes to the road

The Solar Energy UK Installer Roadshow is back for February 2015 promising to help REI readers win new business

Solar Energy UK Installer Roadshow is a series of half day seminars that provide an accessible, educational opportunity for SME and commercial installers to learn more about all the latest trade essentials for running a successful solar business in the upcoming year. Each roadshow will take a look at how solar installers can:

- Make use of new technologies and work within the policy framework to generate new business opportunities
- How to sell solar to a business
- Address the UK's current commercial rooftops opportunity
- Keep abreast with evolving standards such as MCS, finance and how the industry can improve 'quality' overall to the benefit of installer businesses, customers and the longevity of the industry.

Bookings are open across key locations outlined below:

- Tuesday 10 February – Surrey
- Wednesday 11 February – Somerset
- Thursday 12 February – Manchester
- Tuesday 24 February - Edinburgh
- Wednesday 25 February - Yorkshire
- Thursday 26 February - Leicester

For partnerships, sponsorship and general information, please contact **jwight@solarmedia.co.uk** or visit the Solar Energy UK Installer Roadshow website.

Comfort meets technology

Chloe Hyland, Messe Frankfurt UK, explains what's on offer to REI readers at next month's ISH exhibition in Germany

It's that year, 2015, for you to swap your packed lunch at the office for some bratwurst in Frankfurt. Not since 2013, has the world's leading trade fair for innovative bathroom design, energy efficient heating, air-conditioning technology and renewable energies opened its doors!

Biennially held, ISH is the foremost showcase for intelligent living and innovative building solutions, so it's a must attend event.

Between 10-14 March 2015, Frankfurt will see the exhibition halls fill up with over 2,400 market leading exhibitors ready to showcase their latest products, technologies and solutions at ISH. Covering a massive 260,000sqm, visitors require comfortable shoes and heaps of energy ready to acquire business contacts and invaluable market information. ISH welcomes international visitors from the installation trade, retail trade, firms of engineers and architects, housing and property companies, service providers, public authorities and universities.

Numbers game: ISH 2015 will welcome over 2,400 exhibitors from the renewable and allied industries in Frankfurt from 10-14 March

Access all areas

Displaying an overview of the market, ISH aims to make it easy to access your manufacturers and their competitors by dividing the exhibition halls into product groups including:

- Building & Energy Technology
- Efficient systems and renewable energies

As well as the unique product spectrum on display at ISH, the comprehensive programme of events completes your visit. A visitor would do well to see every event because the selection is extensive. However, ISH makes it simple for visitors by categorising the events into themes; Water, Energy and Competitions. Visitors can pick and select which event best suits their needs and with such a variety, there is certainly something for everyone.

Also new for 2015, the show presents trends in the fields of single room fireplaces. Reflecting the changing demands of homeowners, the very well insulated low energy and passive houses or energetically high-quality buildings that are already in existence, manufacturers from the single-room fireplace segment will be displaying their innovations in Hall 9.2. Product launches and innovative solutions are not the only new comers to ISH 2015.

Flying the flag

For the first time, ISH introduces a partner country concept and for 2015, Poland takes centre stage. As a way of acknowledging the close relationship between Germany and Poland, and with regard to a European energy union illustrating the importance of energy policy and independence in the procurement of raw materials, Poland is in favour. As the world's largest trade fair for the combined resources of water and energy, ISH is particularly well suited for providing Polish companies with a platform for presenting their sustainable technologies to UK and international trade visitors.

And it gets better for visitors, because the exhibitor internationality extends far beyond Poland with over 1,400 exhibitors travelling to Germany for the show. ISH is an opportunity for trade visitors to extend their imports from regions far and wide and to place orders for the most innovative products in the market. ISH is much more than an industry order platform; visitors will discover trends, live presentations and workshops over the four busy days.

For ISH 2015, the show motto is 'Comfort meets Technology' reflecting what the trade fair stands for such as future oriented issues; resource conservation and renewable energies. With more than five decades standing for growth, continuity and a successful concept, play your part in the half-century success story! Don't miss your industry event. For more information and how to get your discounted rate ticket contact: **info@uk.messefrankfurt.com**

It's 'oil change' for OFTEC

OFTEC director general **Jeremy Hawksley** tells REI about its new renewable registration scheme and why the maxim OFTEC = oil no longer holds true in a diverse energy era

Q: Can you outline OFTEC's renewable registration offering?

OFTEC is keen to support our existing registered technicians to move into renewables and we also want to attract renewable installers who are not OFTEC registered to join us. Our aim is to offer a complete off-gas service so, in 2014, we launched registration and MCS certification in heat pumps and solar thermal to complement our existing oil and Part P competent person registration scheme and our Green Deal installer scheme. We will add biomass by mid 2015.

OFTEC's experience as a competent person scheme provider means installers can be assured of receiving a first class service at a very competitive price. We also offer free technical support and a range of other benefits. The key benefit of registration is that it allows installers to self-certify their work for building regulations in England and Wales, so you only need to do a few installations each year for registration to pay for itself.

Q: How strong has uptake been since launch?

Our 2013 technician survey showed there was demand for the scheme and so far it has been very well received. We anticipate that renewable registration numbers will grow steadily in the next few years, reflecting the gradual diversification of the heating market. However, with the price of oil remaining very competitive, we don't anticipate a huge shift overnight.

Q: Why has OFTEC chosen now to branch out into renewables and this time in particular?

The domestic RHI is sure to act as a catalyst for growth in the renewables market, so the timing seemed right. Forward thinking installation businesses are always looking to improve their services and, for many, adding renewables makes a lot of sense. We don't see it as an 'either or' choice and, for many businesses, traditional and renewable heating technologies can be complementary. The idea that OFTEC = oil has now changed and we hope our registration will appeal to a wide range of businesses, including installers who are solely engaged in renewables.

Open arms: OFTEC director general Jeremy Hawksley encourages installers both registered and non-registered as OFTEC technicians to consider membership of its new renewable scheme

Q: What benefits does OFTEC registration offer to installers compared to rival schemes?

Our aim is to offer the most complete registration service and to compete very strongly on price and quality. We have a lot of experience and really understand what installers want. We already have a strong installer base on our books and hope that we will be a one-stop registration solution for many rural heating installers.

Q: Is this scheme only offered to OFTEC registered oil technicians?

Anyone can apply. Because we compete so strongly on price we think our registration service will appeal to all renewable installation businesses. At its heart, OFTEC's registration scheme has always been about providing excellent service for consumers so, as long as you can meet the industry-recognised standards required for our scheme, we would be very pleased to hear from you.

Q: Why has the introduction of biomass been staggered?

It would have been nice to be able to offer a complete range of registration services from day one. However, in reality it takes time to get the necessary approvals from government in place. It has also taken time to build up the in-house expertise we need to offer the kind of service we pride ourselves on.

We chose to start with heat pumps and solar thermal because they naturally complement oil heating. Biomass is seen as a renewable alternative to oil and LPG by many people, so it makes sense for us to offer that next.

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Taking the middle ground

As public indignation at rising energy prices and the need to decentralise generation move ever further up the agenda, **Tony Stiff**, CEO of Flowgroup, argues that microCHP could be the silver bullet we're all looking for

In some ways it's a terrifying time to be in business. One minute you're happily driving an expensive black cab or running an over-priced hotel, the next people are paying to sleep on other people's sofas (airbnb) and hailing a lift from anyone they like (Uber). Disruptive business models can and do appear overnight.

For a long time, it seemed like rapid change in the energy industry was unlikely. Central generation run by a handful of large companies made some sense. Bills were relatively affordable, demand was manageable, investment was available, the environment could be ignored and customers were relatively compliant.

Hidden agenda: microCHP deserves a much higher profile in a sector dominated by solar and wind, suggests Flowgroup CEO Tony Stiff

Call to action

Of course, almost all of that has changed. Now, the energy industry is awash with well-publicised problems, and everyone demanding that something be done.

Disruptive business models very often turn an industry completely on its head. This is what may now happen with the energy industry. The thinking goes that if customers are feeling disengaged from the energy industry, that can be rectified by involving them directly in it. If bills are rising and the environment is suffering, let's reduce bills and emissions by generating electricity more efficiently.

Decentralising generation involves moving away from central power stations to generation by businesses, groups and individuals on a local level. Even if there were no economic, environmental or structural benefits in doing this it would, philosophically, be the right thing to do. The energy industry needs to engage customers much more if it's to successfully deliver the huge change that's required to transition to a renewable and low carbon future. Involving people directly in generation does just that.

Efficiency drive

But, of course, there are significant economic, environmental and structural benefits in microgeneration. Big power stations are relatively inefficient and lose huge amounts of energy during generation and transmission to homes. So generating electricity in the home makes sense.

That said, one of the inherent issues with some forms of microgeneration is that it can't reliably take pressure off the Grid, or that it does it at the wrong time. Solar often produces most electricity when people need it least. Wind is famously intermittent. However, there are technologies in development which will allow renewable power to be stored, meaning it can be used at more appropriate times.

Supply and demand

Solar and wind are the big names in microgeneration. But microCHP technology is a strong addition to the mix. MicroCHP technology, often in the form of a domestic boiler, generates heat for a household's central heating system and also electricity for the home. Crucially, it generates most electricity when demand is highest – on cold, dark evenings when the boiler is at full throttle and central generation is under most strain. While it uses gas rather than being a renewable technology, the carbon intensity of microCHP is less than half that of the marginal peaking plant it displaces. Considering that gas will continue to play a key role in generation for at least the next 20 years, technologies that use gas more efficiently to generate lower carbon electricity, and that reduce bills and re-engage customers with the idea of energy are an important element in the energy mix. Installing 500,000 microCHP boilers with an annual output of 2000 kWh of electricity is equivalent to a large central gas fired power station.

While mass market adoption at that level might seem fanciful, with 1.7m boiler sales annually in the UK and a rapidly reducing cost for microCHP products based on recent technological advances, it might be possible to suggest that the decentralisation of energy generation has just entered a new and incredibly exciting phase.

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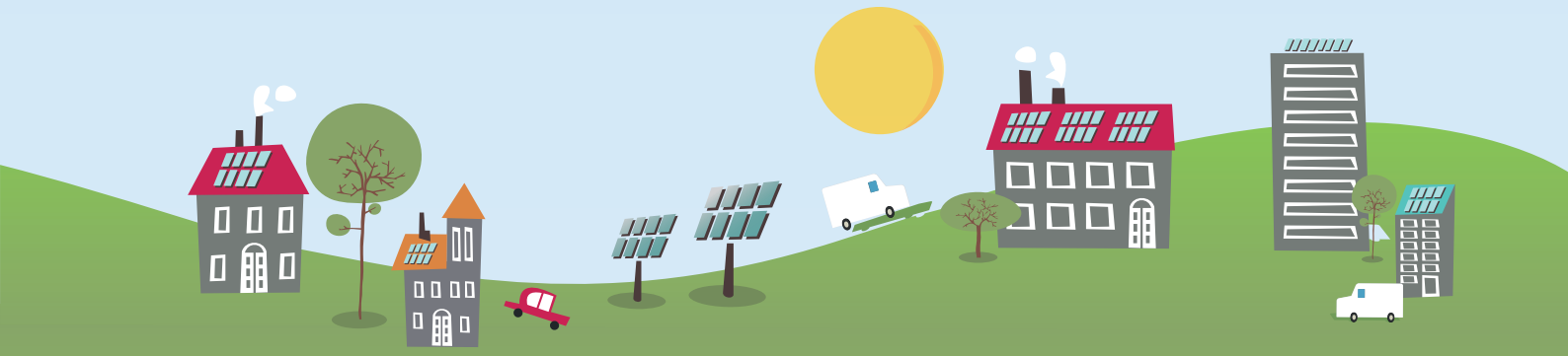

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Standard deviation

Despite the number of power diverters fitted to PV installations increasing exponentially, 4eco's innovation director **Jodi Huggett** asks if meeting Electromagnetic Compatibility (EMC) standards is one step too far for the renewables industry?

Recent figures from DECC show that over 80,000 solar PV systems were installed across the country between January and August of last year - a 23 percent increase on the same period in 2013.

To make the most of this trend and increase the potential of renewable consumption, eco businesses nationwide have dedicated significant resource into developing innovative cleantech products – to increase the efficiency of energy generation.

Self-consumption technologies

There is now a proliferation of microgeneration power diverters that are sold throughout the UK and Europe. These devices are rapidly becoming highly desirable for eco-conscious homeowners looking for new ways to save money and embrace ever-greater levels of sustainability.

Power diverters help end-users self-consume the green energy that is produced by their microgeneration system. These devices monitor power being exported to the grid and divert this surplus power to a designated load, normally an immersion heater.

Whether in a domestic or small scale commercial scenario, up to 100 percent of self-generated power can be consumed. This helps to reduce reliance on the grid, reduce energy costs and reduce individual carbon footprints. These devices require minimal initial investment and are easily installed, either as a retrofit project or as part of a new microgeneration set-up.

The latest insight from UK installers has identified that over 50 percent of new solar PV installations include such devices, demonstrating the technology's influence in the purchase decision of consumers nationwide. This means that, in 2014 alone, around 50,000 devices have been installed as part of new microgen set-ups. In addition to this, there are the many thousands of devices that have been retrofitted.

Is it fit for purpose?

To say that all microgen power diversion technologies are comparable is simply not true. These devices vary significantly in performance, efficiency and durability.

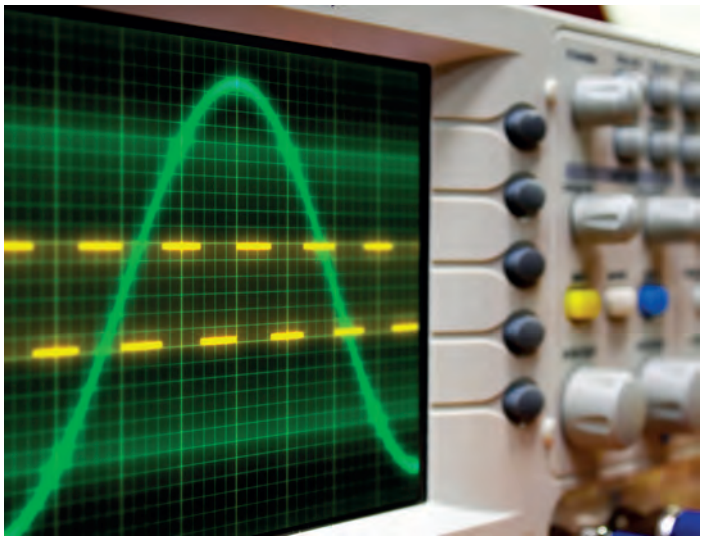
The market currently plays host to over a dozen different devices – all claiming to deliver the same results. This, unfortunately, is not the case. In fact, as the development of many of these devices has been rushed to meet market demand, a high percentage fail to meet the EMC standard for harmonic emissions. Many of the 50,000 devices installed so far this year, do not comply.

The immerSUN's truSINE power control technology diverts self-generated renewable energy to its destination. This technology employs pulse width modulation (PWM) which ensures the power is delivered to the load as a true sine wave. This highly effective control method means the immerSUN complies with all applicable parts of the EMC directive 2004/108/EC, including EN 61000-3-2 - the harmonised standard for regulating levels of harmonic emissions.

The same cannot be said for all devices, however. Of the fifteen known systems currently on the market, only three use PWM. The others use an alternative energy management technology called 'phase angle control'.

80 percent of the microgen power diverters currently available to purchase in the UK are not legally compliant

Phase angle control devices do not produce a true sine wave. Instead, the waveform is severely distorted, creating vast amounts of harmonic emissions. This practice can cause problems with



Dire warning: Many of the 50,000 microgen power diverters fitted in the UK last year do not comply with safety standards, claims 4eco

the inverter and other electrical equipment, including premature degradation of the heater element. Such harmonic interference is also conducted through the cabling, resulting in possible overheating, and can affect neighbouring properties as well as being transmitted back to the grid.

Devices which use phase angle as their power control method will exceed the levels for harmonic emissions and will not comply with the EN 61000-3-2 standard. As such, these devices cannot be CE marked and freely sold throughout the UK and Europe.

As a result, 80 percent of the microgen power diverters currently available to purchase in the UK are not legally compliant – an incredibly worrying statistic.

Compliance testing – no hiding place

Although the importance of appliance safety should be prioritised in all new product development and production, compliance policing is not always effectively implemented across the UK. As the burden of CE testing falls on manufacturers themselves, many choose to self-test their products in-house rather than via an authorised body. Third party testing is more expensive but ensures the manufacturer can back up their claims relating to product compliance.

Electrical and electronic apparatus has to be designed so as to pass the relevant EMC and safety standards. This cannot just be an afterthought.

Third-party testing by a notified body is not compulsory. Irrespective of the chosen route (in-house or authorised), the manufacturer has full control of how their product is tested, in order to attain the required standard. This can lead to the manipulation of testing parameters, so as to corrupt the validity of the result. For example, the product may not have been tested in a state representative of its normal use, or that most likely to cause maximum disturbance.

Trading Standards is the Market Surveillance Authority in the UK for EMC. One must ask themselves, is there likely to be the specific knowledge of EMC, together with sufficient manpower to effectively police compliance?

Consumers need to be safe in the understanding that each and every product that they purchase is safe for use

Levelling the playing field

Consumers need to be safe in the understanding that each and every product that they purchase is safe for use and free from dangerous side effects – something which the renewables industry is currently not achieving. There is undoubtedly a great deal of government support for renewable technology, but there does not seem to be the same interest in the effective monitoring of compliance.

Maybe then, the responsibility lies with the wider industry itself? Certainly the MCS operators have a vested interest in the compliance of these devices, as all inverters have to pass the very same harmonic emissions tests that these products are failing. Unless we can effectively address this situation, then non-compliant products will continue to be installed into homes and businesses across the UK and Europe.

Rule breakers: Jodi Huggett, director of 4eco – manufacturers of the immerSUN, has hit out at the lack of enforcement of European product safety standards

The electoral mist descends

With the run-up to the general election firmly under way, **Neil Schofield**, head of government and external affairs at Worcester, Bosch Group, casts his eye over what this year - and the election result - might mean for ECO and Green Deal

Before their introduction, the ECO and the Green Deal schemes were positioned as the latest revolutionary step for the heating industry.

The ECO initiative, which will run until 2017, may have contributed to the sale of a record number of boilers in 2013, but its impact on the renewables sector has been minimal. While it is always encouraging to see the government investing in energy efficiency enhancements, the number of people benefiting from these initiatives showed a significant drop once the chancellor all but ended the heating element of the ECO scheme in his 2013 autumn statement.

With hindsight, we can also see that DECC has failed to grasp the nettle and give installers the kind of access they need to make the scheme a success. When it comes to ringing the changes in terms of the way homes are heated, the installer will always be king, but this was a fact undoubtedly overlooked given the amount of red tape installers are being asked to overcome.

When it comes to ringing the changes in terms of the way homes are heated, the installer will always be king

To date, the RHI really has been the only show in town for the renewables sector, but even this scheme has its limitations thanks to a heavy weighting in favour of biomass. The absence of any favourable tariffs on offer for alternative renewable technologies has unfortunately ruled out take-up for a significant number of homeowners throughout England and Wales.

The political agenda

With the facts seemingly not offering too much encouragement to either Green Deal or ECO at present, it is interesting to note that each political party is taking a different approach with regards to environmental policy.

The Conservative party now appears to be more interested in building roads than reducing emissions, with support for potentially vote-winning bypasses around congested towns and extra lanes on motorways replacing any prior eco-friendly focus. It is perhaps disappointing that the self-proclaimed 'Greenest government ever' has seemingly turned its back on the environment.

Regulation seems to be the watchword of the Liberal Democrats, with Ed Davey announcing the party's plans to introduce similar legislation to that which was such a boon to condensing boilers, along with incentives such as council tax banding reductions, and stamp duty rebates.

The party most committed to talking about environmental policy is, undoubtedly, the Labour party, which has promised a shake-up of Green Deal funding. This will see the current seven per cent interest rate reduced to zero in a bid to lend the scheme fresh impetus. Then comes a view to targeting more closely those categorised as 'fuel poor' by working with local authorities to distribute energy efficiency measures using allocated ECO funding.

It is unclear what relevance, if any, these high-level policies will have for the installer and the precedent set over past 12 months suggests that, at least in the short-to-medium term future, it will be business as usual on an everyday level.

What is apparent is that 2015 is set to be an uncertain time for environmental policy. An electoral mist has already descended, and the industry will have to wait until after 07 May - and perhaps longer still - before it can know the lie of the land.

Party line: Despite clear blue water between the environmental positions of the three main political parties, Neil Schofield of Worcester, Bosch fails to see much promise for installers at May's general election

The party most committed to talking about environmental policy is, undoubtedly, the Labour party

Transfer of power

A new company dedicated to supplying and installing affordable storage systems for renewably generated electricity is starting to make waves in Cornwall, reports Wattsor founder **Peter Cunningham**

Wattstor has developed its own smart-switching and battery storage systems designed to optimise the electricity generated by solar panels, wind turbines and other renewable sources.

The systems can be fitted to any property – domestic, commercial, industrial, agricultural - and currently cost in the range of £600 to £1000 per KWh of energy, with warranties of five to 20 years.

Wattstor was founded by chartered engineer Peter Cunningham after he 'retired' to Cornwall and built his own 'energy-positive' eco-home. He saw the first offerings on energy storage systems in 2012 and set out to design an affordable system to challenge criticisms that renewably energy generation was intermittent and at the 'wrong time'.

A Wattstor 'banks' surplus renewable energy, rather than sending it back to the grid and then 'withdraws' it when the sun goes down or wind drops. Peter believed that for it to be a real game-changer it would need to be affordable and viable without subsidy.

Peter teamed up with Mark Smith, MD of existing Cornish renewables firm ZLC Energy. They came up with a system that in the domestic setting uses energy generated firstly to satisfy household loads, then charge the batteries and, finally, to power an immersion heater for water. Only once those demands have been met does the Wattstor send any power back to the grid. There is also a standby power facility in the event of a grid supply failure.

Number crunching: The Wattsor microgeneration power diverter can reduce PV-generating households' electricity imports from the Grid by as much as 80 percent, claims company founders Peter Cunningham and Mark Smith

There is another benefit. As FiT payments for systems up to 30kW capacity are based on energy generated and not the amount sent back to the grid, it leaves them unaffected. So the property owner gets to store and use more of their own 'free' energy, minimising consumption of expensive grid energy.

Peter and Mark realised it was not good enough to ask potential customers and investors to take their word for the system's performance, so arranged for it to be monitored and independently reviewed by the Environmental Sciences Institute of the University of Exeter's Penryn Campus.

They monitored the prototype Wattstor fitted in Peter's home and concluded: "The electricity import (using utility company data) in July 2012 was 534 kWh with solar PV only. In July 2013 with a Wattstor fitted this was 107.9 kWh. This represents an 80 percent reduction in utility company import to the home during summer periods of high solar generation.

"The Wattstor substantially maximised the self-consumption of solar PV generation and minimised the import of grid electricity at the test site during the monitoring period.

"The daily electricity import from the utility company averaged 3.5 kWh (costing 53p at a 15p tariff rate) during July 2013 and on two very sunny days was less than 1 kWh."

The payback period for the test site was calculated to be 5-7 years

Field testing apparently confirmed the attainment of the design objectives – maximum free energy consumption and minimum expensive energy import.

Full reports on the prototype and testing are published on the company's website www.wattstor.com

Peter and Mark funded the company themselves for the testing phases but needed to secure the capital to launch the business commercially. After much time-wasting with banks, this was done using a local crowdfunding approach. By the end of August £150k launch capital was raised in full from eight local investors, recruitment commenced and marketing, sales and installations got underway.

The company has committed to remaining in Cornwall for the next six months or so and will then look at a nationwide expansion via accredited/trained installers.

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Partner organisation MCS presents its regular column for REI

Spring watch

MCS would like to take this opportunity to remind installers and manufacturers of the updated standards published in November 2014, and potential changes to the eligibility rules for the domestic RHI.

Subject to parliamentary process and approval of the draft regulations, these changes are expected to come into force in spring 2015

A summary of the standards that have been updated are listed below, and can also be accessed from the standards section of the MCS website (www.microgenerationcertification.org/mcs-standards).

Installer Standards:

- Installer certification scheme requirements (MCS 001)
- Solar heating standard (MIS 3001)
- Heat pump standard (MIS 3005)
- Heat emitter guide (MCS 021)
- Additional requirements for MCS installers to become Green Deal authorised (MCS 023)
- MCS Scheme Matrix

Product Standards:

- Product certification scheme requirements (MCS 007)

Please refer to the final page of each standard for a summary of amendments.

MCS certified installers are requested to ensure they are working to the new standards in accordance with the transition period shown at the front of each standard.

In the case of domestic heat technology installations, please note that the Department of Energy and Climate Change (DECC) issued the following guidance relating to domestic RHI applications:

"The Microgeneration Certification Scheme (MCS) will shortly be publishing updated installation standards for heat pumps (MIS 3005) and solar thermal (MIS 3001) and an updated Heat Emitter Guide (MCS 021). These standards are referenced in the RHI regulations and we intend to update the regulations to refer to the new standards.

"There will be a transition period for the MCS standards and if your heating system is installed in that period it can be certified to either the old or the updated standard. If your heat system is certified to the updated standard you will not be able to apply for the RHI until the changes to the regulations come into force. You will still have 12 months from commissioning of your heating system to apply for the scheme."

For further information regarding the potential changes to the domestic RHI, please visit DECC's website www.gov.uk/decc

Pollard's Patter

Somewhat predictably, an announcement was made late last year that the RHI tariff for domestic biomass installations was to be reduced by 10 percent from 01 January because accreditations have exceeded the well published 'trigger point'. Now I know that this will be met by howls of despair by all those with an interest, including us at Plumb Center, since anything which may be harmful to a fledgling growing market is not desirable.

However, perhaps we can take a longer term view and celebrate the fact that to have exceeded the trigger point then the market must have grown faster than expectations. Secondly, a measured view of the biomass market shows that after degression there is still a very good economic case for fitting a system as opposed to fitting a more conventional replacement. Thirdly, and perhaps most crucially, we never want to get into a situation where a market has to have almost permanent financial support in order to prosper. We certainly need some incentives to create consumer interest, to increase volumes and to give installers and manufacturers some degree of confidence that there will be sustained demand and economic returns to make investment decisions.

As consumer awareness increases, the year ahead should bring us evidence of further uptake in other technologies and hopefully we will see heat pumps and solar thermal subject to degression too!

"The grid is being asked to do a job it simply wasn't built for" Tim Hickman, Evo Energy P36

Performance testing for medium wind turbines

Brian Davidson, writing for the European Energy Centre, examines more affordable performance testing procedures for medium scale developments

When it comes to wind turbine developments, size matters. At the top end of the scale, an initial outlay of around £25M could buy a modest 10-turbine onshore wind farm. However, you would want to make sure that your turbines were performing as expected in order to safeguard your expected returns. That is exactly what the IEC61400-12-1 standard is for – to provide an objective procedure for measuring turbine performance that is recognised by manufacturers, developers and investors alike.

The practicalities of the test can be quite onerous, however, and depending on the wind regime at the site it can take months. The associated costs typically put performance testing beyond the reach of single turbine developments.

While certification schemes might provide sufficient confidence for installations up to 50 kW, the financial incentives are very attractive for midrange developments up to 500 kW – and it is precisely these developments that struggle to afford performance tests.

Fortunately a new edition of IEC61400-12-1 currently in preparation will include several measures to reduce the time needed to collect the required amount of data, thus lowering the costs. One of the changes allows for the use of remote sensing devices such as LiDAR as a partial replacement for tall masts. Once they are in common use, the way could be open for even more lightweight testing procedures in the future and with them further service opportunities for appropriately qualified companies.

To learn more about renewable energy and energy efficiency through learning courses visit www.EUenergycentre.org

Talking point

Liz MacFarlane explains why things are all change for Zenex Solar

As soon as the Zenex Christmas tree is taken down, we start to focus on Ecobuild and this year promises to be a particularly exciting show.

There has been a major change to the Zenex Solar infrastructure and I hope to be able to tell you all more at the event. In the main it will mean we can bring even better customer service and delivery, improved value for money, and a wider range of products. As the solar market continues to flourish and our customers go from strength to strength, then Zenex has developed to make life even easier for them.

One big difference will be our new online design and ordering portal. We'll have staff on hand at Ecobuild to register you there and then, and to enter you in to a prize draw with some amazing prizes including VIP tickets courtesy of JA Solar to join me on the finish line of the Tour de France in Paris.

We'll also be launching our new Samsung complete domestic battery storage solution, with a special show price. Our experts will be on hand to make battery storage simple and saleable.

And of course our exciting JA Solar with SolarEdge embedded smart module will continue to make waves as a game-changing product for all our installer customers.

So, if you didn't already have a reason to visit Ecobuild, you do now! You'll be pleased to know we've moved out of the Renewables Hall and back in to the Solar Hall, further demonstrating our commitment and recognised specialism in PV.

I hope you'll come and see me and my team on stand S6160.

Trust in me

Cathy Debenham, YouGen founder, examines the barriers which persist in restricting domestic uptake of solar PV

Solar PV is everywhere. I defy you to go on a journey and not see panels on roofs or in a field. But have they hit the mainstream? Not according to a survey last year, which found there are still plenty of barriers to entry.

While it identified a healthy appetite for solar panels among homeowners in the UK, the things stopping them from buying haven't changed much from the reasons identified pre Feed-in Tariff. Cost is one, but so is ignorance of the Feed-in Tariff, knowing where to go for advice, lack of trust in solar sales people and finding a reliable installer.

With interest in renewable heat continuing to grow, I suspect the situation is the same, or worse, in this sector too.

So what is to be done? On the ignorance of FITs and RHI, most communication of incentives is left to installers, with manufacturers putting the majority of their marketing effort into trade advertising. Is there a case for trade bodies and manufacturers to get together to do more consumer-facing advertising to educate and raise awareness?

The reported concern about finding an installer is fair enough. While I know that most installers do a good job, I also regularly hear horror stories of companies flouting all the standards. To counter that I'd firstly ban all cold calling for products that receive a government incentive.

Secondly, I'd like to see MCS significantly ramp up the number and quality of inspection visits it makes – and they should all be chosen randomly.

Thirdly, installers can help build trust in their services by signing up to review sites like YouGen (other sites are available!) and asking their customers to rate them.

Do you need to get out more?

Kim Mann, Krannich Solar, looks ahead to another busy year of industry events

When diaries get full and business is busy (or slow!), it's easy to underestimate the value of taking the time to visit industry events and exhibitions. What some see as a chore and others see as a 'jolly' are, in my opinion, usually an immensely productive, valuable and invigorating experience.

In a world where we connect with information and each other in a plethora of virtual and electronic ways, it's all too easy to become rather insular and impersonal in the way we interact and do business. Events such as exhibitions are, by contrast, often the place where you meet that great new contact, or find the fantastic new product, which becomes the catalyst for your next stage of business development and growth.

The renewables industry is blessed with a variety of high quality events, from sector-specific exhibitions such as Solar Energy UK to the unique format and wide appeal of the Heating & Renewables Roadshows. The Roadshows perfectly balance the quality and scale of a national event with the convenience and accessibility of a local one, enabling you to experience the commercial benefits of attending while minimising your expenditure and operational downtime.

Thinking less further afield, next month's Ecobuild exhibition brings together the widest range of renewables 'big hitters' under one roof and offers you the opportunity to compare and contrast a huge range of products and companies in a uniquely direct way. There's nothing like having our direct competitors just a couple of metres of blue carpet away to make us ensure we are on top form and offering renewables professionals the best possible products, service and value.

Healthy competition in an environment like this drives industry progress and excellence, so why wouldn't you want to come along and see for yourself what the latest developments are?

You can find Krannich on stand S6170.

Two minutes with . . .

Who are you?
Paul Barwell, CEO of the Solar Trade Association

What do you do?
The STA is a not for profit trade association representing the solar PV and solar thermal industries in the UK. We are the most influential UK solar trade body with a real track record of winning breakthroughs for UK solar.

Where are you?
We are based in London near Charing Cross – we have just recently moved office.

How's business at the moment?
Very busy! Political uncertainty, the looming general election and defending the industry from the changes to the Renewables Obligation in May 2014 has increased our workload significantly. And these challenges are all additional to our everyday roles of responding to the many DECC consultations, ongoing policy work and membership enquiries.

How could business be better?
How about some political stability! The changes to the Renewables Obligation announced on 13 May 2014 have set an uncomfortable precedent for the renewables industry in general. Budgets are under close scrutiny from the Treasury, and with the FITs review in the second half of this year we could do with some support from the new government.

What's the best business advice you've ever received?
Embrace change – markets move very quickly and you have to keep up. What we 'create' will 'destroy' itself within a few years due to competition, so you need to anticipate and embrace the changes that are needed however tough they may be.

How are you going green?
All our back office functions are now electronic and in the cloud, including all our membership contracts. Much less paper, and much lower overheads.

Q&A

Jon Muldoon

Grundfos

REI: What have you got planned for 2015?
JM: In 2015 one of our key focus areas is to support our customers by offering them the most advanced energy efficient products. We have launched our Comfort range of hot water recirculation pumps, with the patented Autoadapt function, this allows them to only operate when required, saving energy and optimising water usage.

What do you see as the growth area in renewables?
With the latest release of Eco funding from the government, along with the Green Deal, and both the domestic and commercial RHI, the increased uptake in renewable technologies providing heating and hot water will continue to grow throughout 2015. With increased public awareness of the availability of these alternatives to traditional carbon based fuels, and the associated environmental benefits , we are well placed to support this growth with our advanced products and their market leading energy saving features.

How is your company cutting its carbon footprint?
As a company, Grundfos sets very high environmental standards – both locally and globally. Reducing energy consumption related to our activities and reducing our customers' energy consumption is one of the most important aspects in our effort to realise this ambition. We have therefore committed never to emit more CO2 than we did in 2008 despite the growth in our turnover. As we plan economic growth at a 10+ percent level, we have a challenge!

Jon Muldoon is national business development manager for domestic building services at Grudfos

CURRENT AFFAIRS

By guest columnist **Bill Wright**, head of energy solutions, Electrical Contractors' Association

What a year 2014 has been for the renewable energy sector. Wind power is now providing up to 20 percent of demand, and the industry is still expanding. In total there are now over 8GW of wind turbines installed, equivalent to about four very large conventional power stations.

There is also a stop go attitude to PV installations. Despite the lowering of Feed-in Tariffs, PV is still an attractive proposition and the government's aspiration is to have up to 20GW installed within the next ten years. There is some discouragement of solar farms, which many see as a blot on the landscape, but in fact they can be installed on set aside land and even sheep can be grazed around the panels in a field. There is active encouragement of solar PV on commercial and industrial roof tops which seems to have great potential as the power generated goes directly to the building on which it is installed and offsets the electricity bill.

Who could have foreseen the crash in the price of a barrel of oil from $110+ to around the $60 mark? This provides an economic bonus, but will it affect the renewables industry? The industry should remain buoyant as the reduction in oil price will not be for ever and there is a genuine commitment to reduce carbon emissions which the renewable energy industry does exceedingly well.

Whatever happens, this year, with its general election, will be as interesting as ever.

2014 and 2015 at the BRE National Solar Centre

Steve Pester, BRE, looks ahead to an action-packed year for the organisation in 2015

The NSC had a fascinating and busy year in 2014, taking on 3 new members of staff, plus calling on our Associate network of old friends, in order to meet the demand – highlights include:

- Inputting to the DECC Solar Strategy
- Publishing guides on planning for large scale systems and biodiversity on solar farms, as well as more technical documents, such as safe specification of DC isolators
- Contributing to the forthcoming IET Code of Practice for Solar Installations
- Working with the Met Office to improve solar yield predictions
- Building a varied portfolio of consultancy work, ranging from wind loading investigations and fire prevention to assisting councils and social housing organisations with their roll-out of solar projects
- Providing some free technical support for local businesses in Cornwall

In 2015 we expect to continue the research and publishing activities, but we are also ramping up our consultancy offerings, so as to become more financially independent. For example we will be expanding our project support and due diligence services: feasibility, tender support, assessments of suppliers and technology, design reviews, inspections and independent QC roles.

Alongside this we will be:

- Assisting DNOs with storage trials, writing guidance, inputting to standards, etc
- Inputting into government policy
- Conducting investigations into fires involving PV, and other faults or issues
- Providing supporting for the roll-out of 1 GW of solar on government estate
- Doing further work on our outdoor test site (much of the planning has been completed; we are currently seeking the next tranche of capital to take the project forward).

If you have a product or research idea, or would like some help from us, why not come and see us at Ecobuild?

TECH TALKING

Beyond domestic heating

With the domestic market for heat pumps remaining sluggish, heat pump specialist **Bob Long** looks at the merits of focusing greater business attention on commercial-sized installs

Having waited patiently along with many others for the arrival of the RHI for heat pumps, I was gravely disappointed by the outcome. The reception given to the RHI by an overripe and desperate audience was euphoric for a very short period, only to realise that the incentives available to biomass boilers took away any meaningful desire to own a heat pump.

The relatively low level of financial support through RHI, coupled with a simultaneous government initiative to give away gas boilers in certain sectors, means the uptake of heat pump technology continues to be quite lethargic.

Although changes to building codes are well met by employing heat pump technology, the volume uptake of heat pumps for domestic users in general, is still quite slow, and currently viewed by many companies as too small a return to warrant the marketing effort.

To compound these negatives, too many companies chasing too little work has in many instances reduced the cost of installation to a level where contractors cannot afford to honour guarantees, or provide any meaningful level of customer aftercare. Not to mention the number of companies who conveniently go out of business!

This situation has to change, as the UK continues to address carbon reduction issues, and more electrical energy is fed into our national grid from a growing mix of renewable resources.

For the heat pump industry, the question must be; Is this going to happen fast enough to support the basic economic needs of survival?

The industry is further hampered by stringent criteria to be met, with eligibility to benefit from a heat pump through the RHI often difficult to achieve and, in many instances, NOT included in the advice options within a domestic Green deal survey.

From an installer's point of view, the ongoing cost to maintain their position as RHI accredited is a significant financial burden, made difficult by low levels of commercial activity and the high cost annual accreditation fees.

A company fighting to stay solvent often leads to misrepresentation of economic returns and rewards, by an over-zealous sales force, trying to secure an order in a difficult market.

Clearly, in a renewables industry featuring electricity as the common denominator, the heat pump industry must eventually flourish. A heat pump remains the most economical method of deriving thermal energy from electrical power.

Until then, it may be worth looking at different sectors where the commercial returns are sufficiently attractive without government red tape and financial assistance.

Air and water source heat pumps can collect energy from many sources and commercial opportunities can be plentiful.

For example, an air source heat pump benefitting from warm ventilation air from a small bakery could provide all the hot water required at a fraction of the cost of an immersion heater and boiler, or a water to water heat pump could capture valuable energy from waste water.

These examples do require a small degree of engineering but there are numerous companies capable of producing designs, and installation thereafter is generally quite straight forward.

Equipment purchases to reduce carbon emissions in the commercial sector are often rewarded by reduced taxation, but obviously a question to ask your accountant.

Although the domestic market in UK is potentially massive with over 22 million homes, until the RHI makes heat pump ownership as financially interesting as the early days of PV, an alternative market in the non-domestic sector could be an interim answer to commercial survival.

Growing opportunities with the RHI

Robert Burke, HETAS, reflects on 10 months of the domestic RHI

As we approach the first anniversary since the launch of the domestic Renewable Heat Incentive (dRHI) in April last year, we have a reasonable amount of data to assess whether the scheme has been a success or not. The most recent data available at the time of writing shows that applications grew steadily every month since the scheme was launched, with over 13,000 installations accredited by the beginning of October.

Air source heat pumps make up 37 percent of all accreditations followed by solar thermal (25 percent), biomass (23 percent) and ground source heat pumps (15 percent). However, there was a significant increase in the number of biomass accreditations made in October, partly driven by seasonality and partly because of increased activity from suppliers and installers. Indeed, OFGEM has reported that biomass systems are outperforming expectations in terms of renewable heat generated.

OFGEM has reported that biomass systems are outperforming expectations in terms of renewable heat generated

Rural areas which have traditionally relied on oil heating are proving to offer the areas of most opportunity for RHI installations. South West England remains the region with the highest percentage of accreditations at 20 percent. The region with the largest percentage increase for accreditations from the first quarter (April 2014 to July 2014), to the second quarter (August 2014 to October 2014) is Wales with a 132 percent increase, shortly followed by South West Scotland with a 115 percent increase.

However, there are still concerns that there are not enough biomass installers approved under the Microgeneration Certification Scheme (MCS). There are currently more MCS approved products than installers, and the growing number of RHI applications – especially in rural areas – offers a great opportunity for existing oil and gas engineers to add biomass to their existing skills to take advantage of the increase in demand for renewables. Companies who have invested in MCS registration are already benefitting in terms of products supplied and installations.

There are currently more MCS approved products than installers

In October last year over half of the £1.7m payments made under the domestic RHI went to biomass. Off grid areas offer the most opportunity for installers with figures showing that oil is the most common fuel to be replaced by renewable technologies under the RHI. To cater for increased training demand HETAS has recently revised the HETAS HD005 direct entry course, which caters for heating engineers who want to add biomass to their existing competencies. It's just one of the many initiatives which HETAS has put in place to support installers and consumers under the RHI.

There are cost benefits to being both HETAS and MCS registered, and for more details on the RHI, MCS certification and training please visit the HETAS website **www.hetas.co.uk.**

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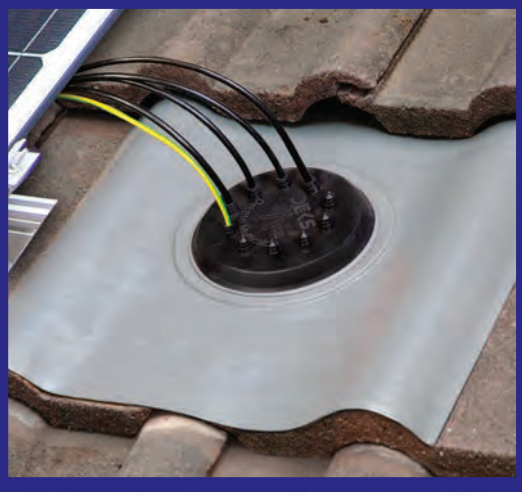

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Going behind the scenes

As we gear up for the 11th Ecobuild, organisers UBM opens its doors to REI to ask that all important question – what exactly does it take to deliver the world's largest showcase of renewable energy solutions? **Alison Jackson**, group director of sustainability & construction, reveals all

Join the crowd: Now in its 11th year, planning for Ecobuild begins up to 12 months prior to opening its doors to visitors in March

Think back to the first ever rock concert you attended – the intoxicating atmosphere created by the lights, sounds and most of all, the crowd of people all there for one common cause. Whilst B2B trade events may not be quite as glamorous, the strict planning, communications and delivery is much the same, as is our audience - a set of peers with a common goal, albeit to learn and procure the latest products and solutions from across the renewables market.

Coming alive

A live event needs a team of lively, passionate people and that's exactly what we have at Ecobuild! Our 30-strong team works tirelessly all year round to make sure Ecobuild delivers an environment where visitors can not only source and learn about the very latest renewable solutions, but also experience an enjoyable environment whilst they are there.

From a live showcase of the very latest renewable technologies and business advice over on Plumb Center's Practical Installer, to the purpose-built Solar City and Green Energy theatres packed to the rafters across the three days, Ecobuild is a year-round occupation.

Staged annually at London's ExCeL, Ecobuild's show floor is meticulously planned to help visitors navigate the event and exhibitors to receive a good flow of potential buyers. This year, we have split the show into two distinct areas of which energy now accounts for a whopping 50 percent of the floor plan. This is the work of marketing, operations, sales and the team at ExCeL to ensure the event is well signposted, that a logical layout is achieved and there is a good mix of product, education and networking space.

A common misconception from those not working in the live events industry is that we rock up at ExCeL, plug in a few lights and off we go. Simply providing the electrics and infrastructure to display the thousands of sustainable design, construction and energy solutions from over 800 companies is no mean feat. And that's without supporting the development and implementation of space-only stands whereby exhibitors bring their own installation on site.

Over on Practical Installer for example, creative lighting rigs, stage designs and private break-out meeting spaces are all works of art between Plumb Center, stand contractors and the Ecobuild team.

The reality is that we are actually working with a completely blank canvass. Imagine opening the doors on a huge empty warehouse. From floor plan layout to the exact positions of power points, lighting rigs and flooring, each must be painstakingly mapped out to showcase products professionally. Our operations team make their way up to ExCeL a whole two weeks before the show even opens to deliver this!

Ten years after

If that wasn't enough on the deliverables, the entire conference and seminar programme is also put together in-house, from sourcing celebrities and industry experts, to the specific topics they cover and the panels they participate in.

We are immensely proud of Ecobuild and the feedback we receive from installers that we do deliver the marketplace for renewables in the UK.

Starting out as a small 'green construction' conference for just a few hundred people at The Old Truman Brewery on Brick Lane, Ecobuild a decade on truly is the UK's premier energy event and we really hope to see you there this March! Visit www.ecobuild.co.uk to register for your complimentary ticket today.

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Warming up the RHI

Innasol's founder and CEO **Silvio Spiess** shares his 2015 renewable heating predictions and explains why his company is committed to helping more and more home and business owners enjoy its benefits

The Renewable Heat Incentive, which was introduced in November 2011 for commercial use and extended in April 2014 to include domestic use, has since given UK consumers a fantastic opportunity to save money and reduce their carbon footprint. As of autumn 2014, more than 23,000 renewable heating applications had been approved by Ofgem – a huge amount, of which 6,000 units have been installed through the commercial scheme into buildings such as farms, schools, hospitals, hotels and office buildings.

Band of brothers: Innasol founder Silvio Spiess says his company's accreditation scheme offers the best support package to installers moving into the growing market of biomass

Biomass gold rush

Biomass has so far performed well ahead of DECC's expectations. It is proving particularly popular on the non-domestic side: as of September 2014, of all non-domestic installations 94.4 percent were biomass. On the domestic side, biomass is second only to air source heat pumps in uptake.

Some have speculated that the renewable heat market could experience a 'gold rush' for biomass boilers in 2015 as a growing number of businesses and homes wake up to the savings that biomass brings - both in carbon emissions and for the pocket. This is highly probable, and is reflected in my expectation of further strong growth of biomass in 2015.

RHI

The RHI is forecast to grow in popularity, particularly throughout the domestic market as homeowners get wise to the initiative and snap it up before more tariff degressions are put in place. This mentality is spurred on by January's tariff degression, which put the commercial rate at 6.8 p/kWh and the domestic at 10.98 p/kWh - less than initially expected.

The volatile oil price will continue to fluctuate and, despite dropping at the moment, is bound to increase in the long term when compared to cheaper options such as wood chips and pellets. As decision makers realise this, choosing renewable heat for public projects will become more prevalent practice.

Hot on training

As subsidies continue to decrease, it is vital that we capitalise on the maturation of our industry to ensure longevity. We can do this by creating jobs, developing our staff's skills and ensuring exceptional standards of customer service. It is in this way that we will prepare the renewable heating sector to move away from government support whilst remaining attractive to consumers. 2015 is the perfect time for this – our technology's increased popularity should cause renewable heat businesses to put a stronger focus on training and further invest in green job creation. I think we are going to see those companies that provide training - such as ourselves - broaden the level and scope of their offerings.

This is something that Innasol is proud to be leading. Through our creation of the renewable heating industry's first accreditation scheme and our recently expanded BPEC-approved training facilities, we are dedicated to ensuring high standards of installation and customer service nationwide. We have made it a priority to provide an array of courses which develop the skills needed by our engineers to go above and beyond, covering subjects like business strategy and customer service that will enable our experts to thrive.

Renewable heat and the RHI remains, in my opinion, the UK's greatest ally in our attempt to reach carbon emissions targets and mitigate climate change. The one thing standing in the way is a lack of awareness and understanding of just how easy it really is to get on board. The industry has made great gains in 2014, and hopefully 2015 will bring more of the same.

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Putting safety and performance first

Jason Hobson, managing director at Gledhill, discusses the safety and performance implications inherent in cylinder specification for heat pump installations

With both ground source and air source heat pumps growing in popularity, The Energy Saving Trust has recently completed the most in-depth study of its kind into the performance of this type of renewable technology in residential installations.

Unsurprisingly, the results clearly indicate that proper installation to the highest standards is critical to both maximising the available energy and ensuring safety standards.

After beginning its investigation in 2010 by gathering technical data from existing heat pump installations, The Energy Saving Trust compiled best practice heat pump installation guidelines. Phase 2 of the research has now assessed the extent to which those improvements in system design and installation have enhanced performance, reiterating the importance of following the guidelines.

Correct specification of the entire heat pump installation is the first step in ensuring both safety and performance. Understanding the cylinder options available is, therefore, critical to ensure that the model selected is designed specifically for use with heat pumps.

Top priority: Understanding cylinder options is key to specifying a high performance heat pump installation, says Jason Hobson, managing director of Gledhill

Hot water

For hot water-only installations, an unvented cylinder specifically designed for use with heat pumps is the ideal choice. It's essential to select a model that is proven to maximise the lower temperatures available from heat pumps, such as Gledhill's StainlessLite HP range.

Featuring an innovative heat exchanger design that consists of a multi-pass corrugated stainless steel tube in parallel, it has been developed to reduce pressure loss while maximising heat exchange. This is designed to cope with the higher flow rates associated with medium to large heat pumps, which produce typical primary temperatures of 50-600C.

Selecting a cylinder with an integral immersion heater and thermostat is also critical to both safety and performance. The lower temperatures associated with heat pumps mean that the stored water temperature may not reach the 600C required to pasteurise the store of water in line with HWA guidance documentation without a boost from the mains.

By combining a thermostat that brings the immersion heater 'on' at a temperature just below the heat pump maximum and switches off at between 60-650C, the cylinder maximises the use of direct energy extracted by the heat pump while maintaining safety and minimising the use of conventional energy for the boost.

For non-potable installations, a vented 'buffer store' cylinder can be the ideal option for maximising the run time of heat pumps, but this must not be used for potable installations.

A duplex stainless steel vented buffer store is designed to absorb any extra heat generated by the heat pump in low load conditions. This can prevent the heat pump from turning off unintentionally if the return temperature to the pump is too high because the building cannot absorb the amount of heat generated. This scenario can cause short cycling, because the heat pump will switch itself back on if the temperature of the returning water drops.

Heating and hot water

Where the heat pump is required to contribute to both heating and hot water, an open vented thermal store such as Gledhill's Torrent GreenHeat HP provides the ideal solution.

Designed to optimise the lower temperatures associated with heat pumps by heating the hot water directly without the use of a heat exchanger/coil, the Torrent GreenHeat HP ensures that the full heat pump output is delivered directly to the thermal store. As a result, the reliance on an additional temperature boost is reduced, to deliver the ideal temperature at the tap.

Torrent GreenHeat HP is supplied with a standard configuration featuring a range of tappings. However, installers should always ensure that the correct tappings are available for the specific application so Gledhill can accommodate optional removal of any tappings or addition of extra tappings when the thermal store is ordered.

Calling for back up

Paul Joyner, managing director of Sustainable Building Solutions (SBS), stresses the importance of strong supplier backing for biomass installers wanting to keep up with rising demand

Following the launch of the RHI for the commercial and now domestic market, there has been a significant uplift in interest around renewable technologies. This is especially strong in the biomass boiler market which has accounted for 42 percent of domestic installation claims since the RHI tariffs were announced in April 2014.

The upswing in biomass affirms what we have seen in other successful government schemes; a healthy return on investment really is the key driver, especially when it comes to the new and expensive technologies used within the renewables sector. Given that a biomass boiler in a commercial building has an average payback period of less than five years and provides a return of around 25 percent, it's clear why it has become so popular. For instance, it is currently overtaking LPG and oil; especially in rural locations where there is no option to connect to the mains gas grid. RHI funding normally exceeds the cost of installation, so the boiler pays for itself whilst the end-user enjoys long-term savings on the cost of the fuel, which is up to 30 percent cheaper than using gas or oil.

Full backing: SBS is best placed to provide installers with a consistent source of technical advice and support, says the company's managing director Paul Joyner

With the backing of the RHI, biomass is moving closer to becoming a mainstream heating solution

With all of these advantages and the backing of the RHI, biomass is moving closer to becoming a mainstream heating solution. This highlights a new challenge for installers; staying ahead of rapidly changing customer demands in an expanding marketplace. With this in mind, installers must be prepared to answer questions about RHI and be in a position to advise on the best renewable heating choice for the customer, which now also includes biomass.

Training is therefore central to capitalising on this growth market. Not only must key team members be fully trained, and the correct installation qualifications be gained, but an alignment with a forward-thinking supplier will ensure a consistent source of advice if needed.

Wider training to support compliant and safe RHI installations is vital

To encourage this to happen, the industry as a whole must continue to support installers, from helping them to recognise the best solution based on space requirements, to in-branch recommendations of the correct flue and fuel type. Wider training to support compliant and safe RHI installations is vital, which is why SBS has developed a range of assessment, training, and mentoring services covering renewable technologies.

MCS accreditation must also continue to be championed by industry figureheads, whilst making access and course completion as pain-free as possible to ensure the return on investment is clear to the installer.

An alignment with a forward-thinking supplier will ensure a consistent source of advice if needed

Ultimately, the RHI has the potential to give an exciting upswing in the domestic renewables heating market and contractors must be ready to respond. Whilst the scheme for homeowners is still in its early stages, it's exciting to see the level of investment that manufacturers, fuel suppliers, finance companies, and the government are continuing to make, which can only be positive for the future of the industry and for biomass as a previously underutilised energy source.

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A&D PUBLISHING

The real cost of renewable energy

Michael Wright, owner of Yorkshire Heat Pumps, restates the compelling environmental and financial case for switching to biomass

We all know that traditional fossil fuel based boilers such as LPG, oil and coal are more harmful to the environment than green alternatives. In fact, over 70 percent of an average home's carbon dioxide emissions are caused by its heating and hot water systems. But there is a widespread perception that installing an environmentally friendly boiler in the home to provide heating and hot water is very expensive. Plus some people think they don't do the job as well as traditional boilers.

This isn't true. Biomass boilers are classed as high temperature systems, which, as well as being ideal for less well insulated properties, run radiators at the same temperature as your existing boiler and can be controlled by thermostats and timers.

And making the switch is not as costly as you might think. In many cases, most or all of the cost of a biomass boiler can be recouped through the government's domestic RHI scheme, which offers a financial incentive to people installing renewable energy heating systems.

Under this initiative, and according to the latest estimates from consumer association Which?, this can range from £11,529 for a two-bedroomed semi to £19,642 for a three-bedroomed detached house, over the seven year payment period.

Home truths: Michael and Kate Wright, owners of Yorkshire Heat Pumps, dispel the myth that switching to biomass is an expensive and ineffective choice for homeowners

Taking into account the average cost of buying and installing a biomass boiler, which can range from £11,000 to £23,000 - depending on property size and the household's heat demand - the income from the RHI scheme can, in many cases, cancel out your initial outlay. You will also have lower operating costs for the long term.

Before you can apply to the RHI scheme, you need a Green Deal Assessment on your home, costing around £120. As part of this, you'll get an Energy Performance Certificate, which is used to determine how much you will be offered in RHI payments. It will also help you to identify any other energy saving measures you may wish to make to your home.

The greatest long-term savings are to be made by people who currently use electricity, oil or liquid petroleum gas to heat their homes. As the cost of gas is very similar to wood pellets, savings for customers currently on the gas grid would be marginal.

Of course, for many people switching to a biomass boiler, it's not just about the financial savings. Even taking into account the planting, harvesting, processing and transportation of wood fuel, carbon dioxide emissions are reduced by over 90 percent. And for some people, making a green lifestyle choice is just as important as saving money.

Ongoing operating costs measured in pence per kilowatt hour (kWh)

Fuel	Coal	Gas	Wood pellets	Oil	Electricity (Economy 7)	LPG	Electricity (standard)
Average price (p/kWh)	3.92	4.21	4.40	6.43	7.09	8.59	13.52

Source: Energy Saving Trust website - DECC's domestic energy price statistics Dec 2013/Sutherland Tables averaged over 2013

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The social network

Daniel Roca, UK country manager for Panasonic Eco Solutions, explains how social media is closing the gap between PV installers and their customers

Social media plays an increasingly important role in connecting solar installers to current and potential customers. In some ways, social media has become an extension of the word-of-mouth recommendations by friends and neighbours that remain a cornerstone of residential and small business solar marketing efforts.

Social savvy UK companies such as Southern Solar and Enviko have an ongoing presence on Facebook that keeps them in touch with their customer communities and increases awareness of solar energy in general. The Solar Shed, a Norfolk-based installer, mixes practical grassroots engagement with its East Anglian constituency along with larger policy discussions on its Facebook page, while maintaining a steady stream of informative videos on its YouTube channel.

But there's more to solar social media than educating the public about the difference between a module and an inverter or sharing success stories of customer satisfaction with how their solar systems have changed their lives. New tools provide consumers with the ability to see how 'going solar' will benefit them and simplify the purchasing process, while inviting them to become part of a growing online community of solar enthusiasts.

One example of customer-facing solar social media innovation can be found in the partnership between global solar module manufacturer Panasonic and online startup Generaytor. Panasonic have launched an interactive consumer-facing service, which offers UK homeowners a tool to design a virtual solar system on their home. The platform provides a precise estimate of how much a solar system would impact their daily energy needs, the financial savings (and earnings) such a system would deliver and, of course, just how much it would cost the homeowner to see solar installed on his or her rooftop.

The interactive tool uses real-time data from others in their community who already have solar systems, providing potential customers with accurate, community-sourced information. By using the service, homeowners can effectively take a solar installation powered by Panasonic HIT modules for a virtual test drive, offering tangible metrics to consumers as they weigh the decision of whether to buy their own system. Furthermore, consumers are able to request a free quote from a professional UK PV installer who can verify the virtual system and provide additional information to the homeowner on installing a solar system.

Once they've 'gone solar', new solar owners become part of Generaytor's burgeoning online global community. They can compare their own energy production data with that of their neighbours, seek advice or feedback from their fellow solar travellers, and offer their own voice in support of the rooftop solar revolution. They can also have some fun with the solar experience by seeing how the production of their own systems matches up with their neighbours' arrays or estimate how many theoretical pizzas could be baked with their home-harnessed solar energy.

This kind of online community approach has obvious benefits for the solar installer as well. The costs of lead generation, customer acquisition, and sales operations can be greatly reduced, as the installer can connect with new customers who have already provided many of the details about their home, energy bill and budgetary requirements via the Virtual Solar platform.

It's no secret that any solar installation business in the game for the long haul knows that to thrive, it must have a solid, customer-facing online presence. However, the herd gets culled when it comes to the effective use of social media as a prospecting, selling and customer service tool. But solar social is not just about finding solid sales leads and closing them, it's also about building community among the 500,000 and counting UK solar homeowners.

Neighbourhood watch: Panasonic's Virtual Solar platform allows users to compare their PV system's data with that of their neighbours, tells Daniel Roca, UK country manager

Pushing the limits

Tim Hickman, technical manager at EvoEnergy, looks at the growing problem of power export limits now facing organisations, and shows how one rural public sector project used technology to overcome it

The UK's march towards renewables continues - at least 15 per cent of power now comes from clean sources according to the latest government figures. The real figure is probably closer to a quarter by now.

However, with so many people now promoting the virtues of self-generation, not enough time is being spent considering the impact it is having on the electricity network as a whole.

The National Grid was designed and built as a one-way street. Power was generated centrally and then distributed down the lines into homes and businesses.

With renewables and especially since the introduction of the Feed-in Tariff, the network has become increasingly congested. Imports and exports are now pushed through a system that is being asked to do a job it simply wasn't built for.

The National Grid was designed and built as a one-way street

To avoid overloading the system completely, Distribution Network Operators (DNOs) are setting more export limits on some larger renewables projects.

Restricting the size of a system may make sense in terms of managing the network, but it often ends up restricting big commercial installs where the majority of potential self-generated power will be used on-site.

That was the problem facing Nottinghamshire County Council as it looked to install solar PV at Hagg Farm, a rural outdoor education centre for young people in the Peak District. The council wanted to fit a 32 kWp rooftop system as part of its £1.8 million investment programme, but because of the centre's remote location, powered only by overhead lines, an export limit was going to restrict it to just 7 kWp.

With no satisfactory off the shelf solution available, our technical team had to develop a new approach. The answer was to make the council one of the UK's first to use an Export Power Control (EPC) system.

The EPC system we developed is comprised of conventional controls used worldwide in industrial automation, only it works to make sure export power stays below an agreed export limit.

It has allowed the council to install the 32 kWp system, benefit from up to 25,000 kWh of self-generated power each year and still only ever export 7 kW or less back to the Grid at any one time.

EPCs can be fitted on to virtually any array and will work with inverters from a variety of leading manufacturers. The EPC at Hagg Farm was fitted at the same time as the Renesota 250wp panels, which were installed on to fragile slate roofs, some more than a century old, in under two weeks by a team of five. By using the SolarFlash system for slate roofs, the integrity of the roofs could also be maintained to ensure compliance with the MCS.

Diversified power generation is here

The answer was to make the council one of the UK's first to use an Export Power Control system

to stay, so it is safe to assume that export limits are too - at least until dynamic energy storage solutions are developed. Many more businesses and organisations will be faced with a limit on the size of their next array because of electricity network constraints.

EPCs allow firms to still install large solar arrays by reassuring DNOs that the level of exported power is controlled and the electricity network will not be put at risk. This way a business can still benefit from the significant offset of imported energy costs during the daytime.

They're an inventive solution to what is becoming a common requirement of the electricity network operators and one of the biggest barriers which many future renewables projects will have to overcome.

Tough task: Nottinghamshire County Council and Evo Energy overcame a 7kWp export limit on its 32kWp rooftop array at Hagg Farm with an innovative EPC system

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Great expectations

Simon Baggaley, UK sales director at Enphase Energy, looks ahead to the likely challenges in store for the UK PV sector in 2015

2014 was a year of stability for Enphase and the solar industry as a whole after a few years that have been difficult for many. We expect this year to be an exciting time for all. The last couple of years have provided a time of policy stability, access to funding and more information about the benefits to solar. The effect of this can be seen in the recent DECC figures that show solar PV deployment in Q3 2014 at an all-time high. The general election in May cannot be ignored, however, all signs point towards minimal disruption which should enable the industry's strong growth to continue.

The funding and access to finance is one of the main reasons that we believe 2014 has been good for us. Customers have not had to pay the entire costs of having solar installed upfront, making it far more accessible, whilst removing a barrier for them. Most people are aware that solar PV saves customers a lot of money in the long term, however, more fluid capital in the market and better offers has helped create an environment where people are warmer to getting solar. We hope that this does not change after the general election.

Third party funding

We believe that the split there is between self-funded and funded PV will lean closer to funded due to fallout from CfD uncertainties on large-scale solar this year. Out of this uncertainty, residential and commercial roof-top will grow this year with greater funding coming from third parties, further helping customers with the upfront costs of solar.

The amount of information on solar and its benefits is another one of the main reasons that 2014 was a successful year. The majority of people now know that PV is beneficial for the environment, and saves you money as soon as it is installed. Education has always been a huge focus for us at Enphase and we have invested a lot of energy in creating an even stronger foundation for 2015 through more interaction with our installers than ever before. This has helped make sure that everyone knows about all our latest developments which have in turn helped make sure that our customers are also better aware.

Guaranteed quality

My advice to customers looking to install solar PV in 2015 would be to make sure they get the best possible equipment from the best possible installers. This past year we have constantly been told by installer partners that more and more customers come to them with previously installed solar and have found themselves needing to replace it due to cheaper models not working after a few years. It is vital to check the warranty of what the installers are providing and that it matches the system life time.

Whilst the industry continues to go from strength to strength, the key uncertainty for 2015 remains the general election, although there has been nothing to indicate that the Feed-in Tariff system will be drastically changed. However, with no manifestos currently published and polling indicating a hung parliament, there are still many questions to be answered.

Status quo: Despite the prospect of a general election, Simon Baggaley, Enphase Energy, predicts a stable policy backdrop for UK solar throughout 2015

We hope that the PV market will continue to grow throughout this year with the help that it received last year. We are confident that 2015 will be a positive one for us and the industry on the whole.

With no manifestos currently published and polling indicating a hung parliament, there are still many questions to be answered

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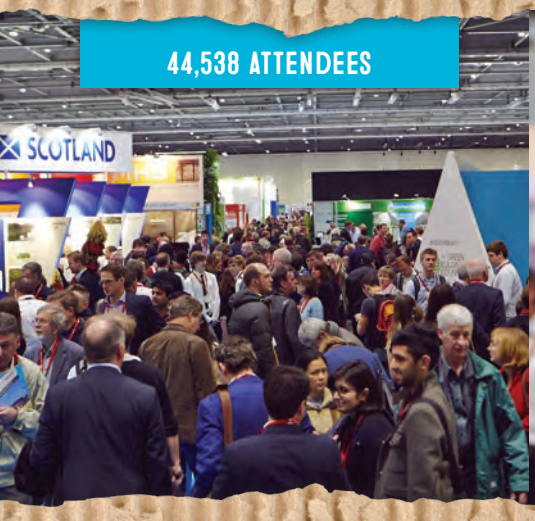

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Eurovision

Michael Etzioni, business director of AC Heating UK, introduces the heat pump manufacturer's product range following its recent entry to the UK market

RAC Heating began trading in 2006 with our Convert AW range of air source heat pumps and unique control system, to the Czech market. Our export market is growing year on year and we currently have sales offices in Germany, France, Belgium, Slovakia, Eire and now the UK.

We currently offer the most reliable heat pumps on the market using only top quality components, and are excited to be launching into the UK market.

Our USP is our XCC Control Unit. This control unit has built in equithermal regulation and is fully controllable offering up to 30 percent more efficiency over and above the high COPs we already achieve. Once programmed the information is stored in the memory of the XCC and does not need to be adjusted. Simple adjustments can be made as and when required by use of a user friendly wall control.

Also, the system can control many additional systems and bivalent sources used including electric boilers and PV panels. Also swimming pool heating and filtration, metering, garden sprinkler systems plus almost any other electrically controlled system in the building.

Historically, controlling these type of systems effectively has been a bug bear of the industry for many years and there has been nothing as versatile and effective as our system. With modern day technology using tablets, smart phones and web interface, our Czech office constantly monitors all our XCC systems and any faults are rectified online or contact is made with the end user if there is a problem outside the scope of the XCC that is being controlled.

Above and beyond: AC Heating has taken heat pump technology to a higher level with its Convert AW range, argues UK business director Michael Etzioni

We are now recognised as market leaders with the most reliable and innovative regulation control system available

Most heat pumps have to run at either 50 percent or 100 percent depending on the season but our system controls mean our heat pumps can run from 30 percent to 100 percent without any additional seasonal adjustments. Once programmed at the initial installation stage, the system automatically adjusts to the desired configuration needed for the building against the equithermal line and the set up parameters. The regulation of the heat pump is smooth, quiet and efficient.

Heat pump technology has been with us for many years and only recently has been recognised as an effective renewable energy source in the UK. The uptake of this technology has been prolific since 2009 and will continue to increase. We have taken this technology to the next level with our control system and we are confident no other manufacturer has anything to equal our system.

Together with our top quality heat pumps and twin rotary compressor and inverter technology, our Convert AW range of products and XCC Controllers are without doubt the most efficient range available.

We offer our own training programme and any installer can qualify to become a certified AC Heating five star installer.

Our heat pumps produce higher COPs than most of our competitors and we do not deviate from the correct testing regulations required of A7W35/A2W35.

A day in the life

REI goes behind the scenes at **RWE Innogy UK's** wind control centre

Juggling up to 350 phone calls and handling around 250 emails each day, the RWE Innogy UK wind control centre team still finds time to ensure its vast fleet of UK wind turbines run smoothly.

With 32 onshore, two offshore and additional client wind farms in the UK, the team of four at the control centre in Swindon certainly has its work cut out. Not that you'd notice by spending 30 minutes with them.

Ashley Stokes, a senior operations controller, starts at 7.00am for a 12-hour shift. "There's no time here for web browsing, or reading industry news first thing," he says. "We have to hit the ground running and be ready for the early morning rush."

There is no typical day and Ashley can be logging people on to site one minute and releasing plant to technicians the next, at the touch of a button.

"We work 24/7, 365 days a year and are the first point of call for anything that happens on any of our wind farms, with any of our 574 turbines or on any of our partners' sites," he adds.

The first task of the day is the shift handover where he will be updated on any alarms or events. If it has been a quiet shift, Ashley will get straight on to the company's bespoke, site-logging Epilog system.

"We log every visitor to a wind farm on to our system, and, if they do not inform us they have left site we will track them down until we are satisfied they are accounted for. We always need to be 100 per cent sure everyone has left our sites, safely and securely."

Next, in accordance with the wind turbine safety rules (WTSR) (v3), he will release wind turbines to technicians.

In addition, Ashley will see if there has been or are going to be any grid outages, he will send weather reports and potential lightening alerts to engineers and will also alert them of other activities that may occur on site that day – e.g. a game shoot taking place.

The remainder of the shift will see him actively monitoring sites on DCDAS SCADA (the company's internal systems). This gathers data from both RWE's and clients' portfolios into one bespoke monitoring system. He will affect resets and start or stop individual turbines or whole wind farms. This, Ashley says, improves reset times and maximises yield.

The whole team plays a pivotal role in the UK for optimising portfolio performance, and does so much more than 'simply' keeping everyone visiting our sites safe.

There can be one caveat, however, that can take hold at any time with no warning – an on-site incident. Ashley recalls a situation where a technician required emergency evacuation from an offshore wind turbine.

"We coordinated everything from here. The transportation vessel was met by a life boat, but our work continued until we were satisfied that all concerned parties were made aware and that the technician had been safely evacuated."

Dream team: RWE Innogy UK's 32 onshore and two offshore wind farms are controlled by a team of just four at the company's Swindon control centre

It may seem like a situation for emergency services from the start, but he is quick to emphasise they have all the necessary training and expertise to act instantaneously and that the first few vital minutes can be crucial while waiting for the emergency services to take over.

Finally, Ashley hands over to the next shift and the new team starts again.

"Wind farms are often in remote, rural locations and can become a very lonely place. However, with us here 24/7 and always at the end of a phone line, we like to think of ourselves as their right hand man and a guardian throughout their visit to one of our sites."

We are the first point of call for anything that happens on any of our wind farms, with any of our 574 turbines or on any of our partners' sites

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Weekend warriors

Short break holiday company **Center Parcs** has improved its green credentials by installing solar at its Nottinghamshire HQ

A 200 panel 50kWp array was completed during just seven days in July by Evo Energy. The system is predicted to save more than 21 tonnes in CO2 consumption for Center Parcs, which operates five Villages across the UK attracting more than 1.7 million visitors per year.

It chose to install the panels on the metal roof space above its offices in New Ollerton, which had to remain fully operational throughout.

The EvoEnergy team therefore took steps to keep disturbance to a minimum during working hours, with scaffolding being erected and dismantled over the weekends and deliveries happening after 9:30am on weekdays.

Scott Roadley, commercial manager for EvoEnergy, said: "For this job we were asked to construct a large array right on top of a fully functioning working environment.

"Because of this the client's expectations were understandably very high, that's why they looked to us to deliver the project, confident that we could meet all of their requirements.

"From initial site surveys and project meetings through to system switch on, our on-site team worked with Center Parcs to complete a sizeable project within a tight timescale without running over budget or disturbing day-to-day operations.

"Work installing the panels directly on to the roof, using U brackets screwed into the metal, began on Monday morning and was done by Wednesday afternoon. We then finished the cabling, inverter installation and rubbish removal by Friday evening."

Time team: Evo Energy's installation team worked around Centre Parcs HQ's operational needs to minimise disruption and complete the 50kWp project in just one week

Flying high

TGE Group has been awarded a £1m contract to install a 1,300kW heat pump for a Shropshire poultry farmer to provide heat and cooling across four new poultry units

Winging it: TGE Group is installing the UK poultry sector's largest GSHP installation in Shropshire

On completion, the system will be the largest GSHP installation in the UK poultry sector.

The project, currently in build, will be managed alongside the construction of the units to ensure the four, 50,000 bird capacity sheds are complete for late spring. The installation of five Geo Qube GSHPs will deliver reactive heating and cooling to each building.

With 11,000m of vertical bore holes, the heat pumps are designed to deliver temperature loads of 33°C, dropping to 20°C over the crop cycle. Underfloor heating will accommodate the base heating load with fan coil units trimming the heating to maintain an accurate internal temperature across multiple zones.

During warmer weather, the fan coils are capable of cooling, helping to reduce humidity and heat levels in conjunction with the ventilation systems, whilst re-charging heat into the well field.

"Heat pumps have many benefits over biomass boilers for new poultry units," said TGE heat director, Matthew Evans.

"They eliminate the need for regular fuel deliveries on top of the other delivery activities involved on site, which can have an impact on planning. Service and maintenance requirements are higher with biomass, plus heat pumps offer the additional benefits of cooling and de-humidification.

"The initial, higher capital cost is soon recouped by the RHI, payable for every unit of heat generated, making payback times similar to biomass. For this project, the payback period is just over four years, with £4m in savings and income over the 20 year RHI term. The system should also be eligible for tax relief from the 100 percent enhanced capital allowance."

Something in the air

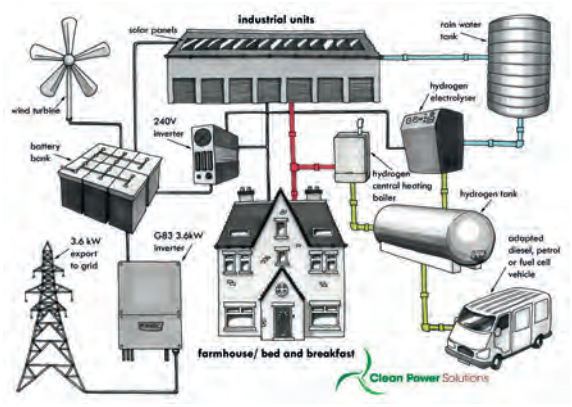
Dr Marc Stanton, commercial director of **Clean Power Solutions**, introduces the company's hydrogen storage project

Spring Bank Farm in Cheshire is like any other mixed farm in the country. The barns have been converted into small industrial units, the farm offered B&B and used LPG for central heating.

Clean Power Solutions needed a test site for its new hydrogen project and Spring Bank Farm was an ideal location. The new system was able to take the power generated by 70 kW of renewables and store it in a battery bank. This was then used to run the power requirements of the entire site by inverting the power back to 240 volts.

Excess power not needed to charge the battery bank was sent to a 5 kW ActaSpa electrolyser which produced hydrogen at 30 bar pressure. This was stored in standard commercial cylinders and used as fuel for a Giacomini hydrogen central heating boiler. The resultant heat was then stored in a buffer tank and with the benefit of additional heat exchangers used as heat for the central heating system of the farmhouse. This fuel could also be used as fuel for a hydrogen powered vehicle or a diesel vehicle that had undergone a relatively inexpensive conversion.

Central to the whole system were the inverters, they had to be able to charge the batteries, export power and supply power to the site simultaneously. They also had to be able to draw power from the Grid if there was no renewable power available and if necessary export power to the Grid at G83 (16 Amps per phase). The solution was a revolutionary new inverter called the Voltlogic from RESATECH. This was the final link that made the whole system work perfectly. The system can handle any amount of renewable power and store it or convert it to hydrogen for use as heat or vehicle fuel.



Gas attack: Clean Power Solutions has demonstrated its hydrogen storage system for excess renewable energy at Spring Park Farm in Cheshire

On the right track

A 1MW solar PV system will power **Hitachi Rail Europe's** first train manufacturing facility in Europe, at Newton Aycliffe, County Durham

Financed by Macquarie Lending, with Hitachi Rail benefiting from a Power Purchase Agreement, it comprises of 3,800 Trina Solar 265W mono-crystalline solar modules with 28 PowerOne Trio27 inverters.

This is the initial project under a framework agreement between PV installer Photon Energy and Macquarie Lending, which is designed to enable organisations with large roof areas to benefit from long term low cost electricity and lower carbon emissions without investing in the infrastructure.

Big three: Hitachi Rail Europe's 1MW PV array in County Durham has been financed under an innovative funding framework in conjunction with Photon Energy and Macquarie Lending

The arrangement involves a 20-year power purchase model under which Macquarie Lending leases the commercial roof space from the building owner and finances the capital cost of the installation. In return Macquarie Lending receives the Feed-in Tariff and sells the electricity generated to the building owner.

According to Photon Energy, owners of buildings benefit from the certainty of linking their electricity price to RPI for 20 years, and a smaller carbon footprint due to their use of solar power. At the end of the 20 year contract period they take on ownership of the solar PV installation and will continue to benefit from the power generated for the remainder of the working life of the solar PV modules.

"The arrangement lends itself to such applications as data centres, distribution hubs, manufacturing facilities and airports, to name but a few," said Rob Alford, Photon Energy's commercial manager, who negotiated Photon Energy's first contract with Hitachi Rail.

"It is suitable for organisations with extensive roof space that also use a lot of electricity, without involving them in capital expenditure they may not wish to make."

SRHA report significant tenant savings

Shropshire Rural Housing and **Kensa Heat Pumps** have reported significant savings for tenants from its RHPP retrofit heat pump project

According to Bryan Powell, chief executive of SRHA, the installation of 63 ground source heat pumps installed under the RHPP social landlords programme has resulted in tenants experiencing immediate savings on their heating costs.

"The objective of undertaking the installation of ground source heat pump systems in our homes is to give our tenants control over their heating, reduce their energy costs and invest in modern low carbon technology to reduce our carbon footprint. Feedback from our tenants has confirmed that this has been achieved as they now have control over their heating using the system to deliver better comfort levels at a reduced cost."

A small rural housing association with over 270 deeply rural homes throughout the county, SRHA's asset management strategy demands an improvement in the thermal efficiency of their properties due to the largely off gas grid profile of their stock, which use night storage heaters as the primary heat source.

Tenant complaints regarding the heaters' running costs and lack of controllability prompted SRHA to undertake a retrofit programme with the support of South West manufacturer Kensa Heat Pumps.

Utilising the Renewable Heat Premium Payment Social Landlords Competition, a precursor to the RHI, the initial cost of the GSHPs were reduced, whilst attracting an income for 7 years through the domestic RHI.

Well grounded: The now defunct RHPP created an opportunity for Shropshire Rural Housing Association to efficiently and cost-effectively transform the heating for tenants in a third of their housing stock

Winning combination

Fairstead Community School in Kings Lynn, Norfolk has turned its back on gas and oil heating to lower its energy costs and carbon footprint

With the school's heating equipment coming to the end of its expected life, Norfolk County Council saw this as an opportunity to look for a more energy efficient solution that would satisfy the school's heating demand.

NPS Property Consultants worked with Hamworthy Heating and their agent, Mike Crouch, to design a tailored renewable solution for the community school with over 320 pupils. The chosen scheme combined solar thermal and a biomass boiler to offer an ecologically efficient heating and hot water system. The school was able to part fund the project through the Carbon Emission Reduction Fund from Norfolk County Council.

Eyre Building Services installed the equipment which included a Hamworthy Herz Firematic 199kW biomass boiler operating on wood pellets to provide the heating for the school. The space previously used for the oil storage was utilised for the flexible hopper wood pellet store with blown delivery to the biomass boiler. A Kamstrup heat meter was fitted to measure the heat generated and used in order to submit an RHI claim.

Stephen Stanforth, building services engineer at NPS Property Consultants, said: "The school's heating was running on an oil-fired boiler and the hot water on a direct gas-fired water heater. There was not a sufficient gas supply nearby to fulfil both the heating and hot water requirements and the school was keen to move to a greener fuel source than oil. We needed to review all the available options to see what would be the best solution for the school, both financially and environmentally.

"The installation was successful and as well as benefitting from lower fuel bills, Norfolk County Council are currently working on the application to receive the Renewable Heat Incentive payment."

Community spirit: The Hamworthy Herz Firematic biomass boiler (left) and Powerstock Calorifier (right) along with other equipment provide the heating and hot water for Fairstead Community School

Around the houses

Windhager is helping the historical village of Matfen, Northumberland, reduce its carbon footprint with a new biomass system

Five houses, the Matfen estate office, a shop and village hall will all benefit from three BioWIN 60kW wood pellet boilers, installed by biomass NorthEast in a cascade system.

Matfen village was built in the 1830s around Matfen Hall, the seat of the Blackett family.

The estate had already begun the transition to green energy with Matfen Hall currently being heated by biomass boilers supplied with woodchips from the estate's woodland. This has now been rolled out to provide heating for selected properties in the village and will reduce annual carbon emissions by 130 tonnes.

Hugh Blackett, owner of Matfen Estate, said: "During the planning stages of the refurbishment it was essential that the estate's historical significance and period properties were taken into consideration. Windhager's biomass boilers were decided upon as the best fitting solution."

Jamie Armstrong, of Biomass Northeast, added: "The aim of the project was to give the tenants a cheaper source of heating with an ultimate goal of eventually achieving a carbon neutral community.

"The BioWIN boilers were specified by myself as I have worked with many biomass boilers for various types of installation and have found that Windhager are superior to other brands. The installation at Matfen went through perfectly and the client is very happy with the end result."

Village people: Situated within the Matfen Estate, Northumberland, five houses, the estate office, a shop and the village hall will all benefit from biomass heating

Blooming marvellous

Panasonic's HIT PV panels are helping a Cornish daffodil producer to reduce grid power consumption

Carwin Farm, J.H Richards & Son's main operations centre, now boasts a 42.24 kWp system which is significantly lowering grid consumption for its energy intensive bulb growing operation.

The owners were looking for a clean energy solution to compliment its 80kW wind turbine. Renewable installer Natural Generation identified an onsite steel building that would be suitable for a rooftop system.

Flower power: Daffodil grower J.H Richards & Son's PV array has beaten generation expectations by almost 20 percent

To meet the owner's objectives, Panasonic HIT N240 modules were recommended to maximise power output from a limited roofspace.

According to system owner Andrew Richards, the panels have outperformed expectations.

He said: "We calculated system generation of 40826kWh per annum. From when the system was commissioned five months ago, we would expected the system to have generated 23353kWh. It has actually generated 27916kWh, which is 19.5 percent more than expected.

"As for CO2 offset, we allow a figure of 0.537kg/kWh generated. So far the system has offset 14.99 tonnes of CO2 with an expected annual offset of 21.91 tonnes of CO2."

At a glance

System size: 42.24kWp
Calculated annual output: 40.826kWh/year
Module installed: Panasonic HIT N240
Number of modules: 176
Project length: Two weeks

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Powering What's Next in Solar Technology

HEAT PUMPS & PV

What: Former WW2 pilot turns to renewable energy

How: 8.5kW Ecodan ASHP

Result: Modern heating and lower bills

A former WW2 pilot and self-confessed 'gadget man' has shown the way to a sustainable future with the installation of a hybrid Ecodan Air Source Heat Pump to work alongside his existing boiler.

Mr Durward of Newick, Lewes chose the Ecodan to reduce the heating bills for himself and his wife and will qualify for RHI payments.

"Heat pumps seem to offer a real solution to the problems associated with fossil fuel heating, which is no longer a sustainable way of keeping our homes warm," said Mr Durward, who has always had a fascination for self-sufficiency.

He has already sunk a borehole down to 200 feet to supply water to the property and has a PV system to generate his own electricity.

East Sussex-based Payne's Heating and Plumbing Services, an accredited Ecodan installer, fitted both the heat pump and PV system.

At Mr Durwood's request, they have also incorporated a power diverter, which transfers any excess electricity generated to the immersion heating, giving the couple regular free tanks of piping hot water.

Mitsubishi Electric has also arranged for a MELCloud Wi-fi control system to be installed so that the heat pump can be monitored and Mr Durward can control his system from either the comfort of his armchair or anywhere else in the world.

"Mr Durward is delighted with the way the system is working and we often use him as a contact for other clients looking at similar works," added Dave Crock of Paynes Heating and Plumbing Services.

Full throttle: Former WW2 pilot Mr Durwood can control his new Ecodan ASHP from the comfort of his armchair with a MELCloud Wi-fi control

HEAT PUMPS

What: Derelict barn conversion integrates renewable technology

How: WPL 20 ASHPs and SOL 27 solar thermal panels

Result: £856 annual energy bill saving and £3,213 RHI income

A Leicestershire barn conversion has been turned into an energy efficient home of the future by harnessing the power of green technology.

The project developer of the former milking shed on the edge of Scraptoft village turned to Stiebel Eltron and Flogas Renewables for two WPL 20 ASHPs and SOL 27 solar thermal panels to minimise running costs.

The annual running cost for running oil was estimated to be £2,610 for the 480m² shed, compared to £1,954 with the heat pumps. The solar thermal panels save a further £200.

Both technologies will save a combined 11,550kg/CO2 per annum whilst annual RHI payments are £3,213, bringing the total yearly cost benefit to £4,069.

Nigel Parkes, a director of project developer Onsen Homes, said: "We had to work sympathetically within the fabric while making subtle improvements that did not detract from the charm of the buildings and their setting.

"Renewables were key and their success on this scheme is that they were integrated from a very early stage in the design."

Mark McManus, managing director of Stiebel Eltron, added: "This was a remarkable project bringing derelict buildings back to life, but harnessing the most advanced and innovative renewable energy technologies available today.

"The return on investment in terms of running cost savings and the benefits available through the domestic RHI are staggering, and explains why we have seen a significant increase in orders since the scheme went live last year."

Changing places: Hall Farm Barns' former milking shed in Leicestershire has been transformed from a state of dereliction to an ultra energy efficient home using renewable energy

FUEL CELLS

What: Wolverhampton house installs UK's first commercially available domestic fuel cell

How: Viessmann Vitovalor 300-P fuel cell system

Result: 50 percent carbon footprint reduction

Viessmann has successfully installed what it says is the first mass-produced commercially available domestic fuel cell.

The Vitovalor 300-P system is designed to supply the Engelke family's 1910 four-bedroom home in Wolverhampton with all the energy it requires and reduce C02 emissions by 50 percent.

Total spend on energy will be reduced by an estimated 36 percent, approximately £400, and any excess energy will be sold to the Grid with an annual return of £600 per annum under the Feed-in Tariff.

The 4,500kWh generated by the Vitovalor is equivalent to 30m² of PV panels.

Viessmann developed the fuel cell-based microCHP system with Panasonic. Comprising a fuel cell unit, peak load boiler and hot water tank, the company says it is MCS-approved and as easy to retrofit in UK homes as to install in new-builds.

Darren McMahon, Viessmann's marketing director, said: "To continue to reduce CO2 emissions and make ourselves, as a society, more energy efficient, we need to develop solutions for gas. Beside this, microgeneration is about twice as efficient as relying on centralised power stations.

" The Vitovalor 300-P is a technology available today, that reduces CO2 by 50 per cent, by using the UK's existing gas infrastructure to make electricity efficiently at the point of use. This first installation into a domestic dwelling in the UK is a significant moment."

Trend setters: The Engelke family's Wolverhampton home has become the first in the UK to benefit from Viessmann's new Vitovalor 300-P fuel cell

BIOMASS

What: Scottish hotel nets large cost savings

How: 2 x ÖkoFEN Pellematic PES56kW boilers

Result: £15,000 cut in energy bills plus RHI income per annum of £15,800

An historic hotel in Scotland is reaping the financial benefits of switching from electric and gas heating to biomass.

Rapidly rising energy costs at the 25 bedroom Royal Dunkeld Hotel in Perthshire forced owners Neil and Catriona Menzies to consider their options.

With an interest free loan from the Energy Saving Trust, the couple worked with installer Perthshire Biofuels and supplier Organic Energy to design a system specific to the needs of the hotel.

The Menzies chose two ÖkoFEN Pellematic PES56kW wood pellet boilers housed in an all-timber larch clad Energy Box. The Menzies estimates that heating costs have fallen by £15,000 per annum whilst the hotel also receives an annual RHI payment of £15,800.

Andy Boroughs, managing director of Organic Energy, said: "The ÖkoFEN Pellematic wood pellet boiler represents the very latest in renewable, sustainable heating technology being both low in carbon dioxide emissions and extremely cost effective."

Neil Menzies added: "I've always been a fan of Austrian engineering and once I looked at what this system could do I was sure that it would deliver on its promises.

"It's certainly been a learning curve making the move to renewable energy but one I'm glad we took given the savings we're seeing and the long-term benefit it will bring to the hotel."

Neil and Catriona hope to have the loan cleared within eight years but will continue to receive RHI payments after that – which Neil says will add to the marketability of the hotel should they decide to sell up in the future.

Loan star: Perthshire hotel owners Neil and Catriona Menzies have secured long term cost savings by switching to ÖkoFEN Pellematic wood pellet boilers, facilitated by an Energy Saving Trust interest free loan

Figure it out

Generation tariffs for non PV technologies

Technology	Band (kW)	Tariffs (p/kWh)
Hydro	≤15	19.01
	>15-≤100	17.75
	>100-≤500	14.03
	>500-≤2000	10.96
	>2000-≤5000	2.99
Wind	≤1.5	16.00
	>1.5-≤15	16.00
	>15-≤100	16.00
	>100-≤500	13.34
	>500-≤1500	7.24
	>1500-≤5000	3.07

(Source: OFGEM)

Number of MCS registered installers per technology

Technology type	Cumulative number	Registered Oct 14
Solar PV	2651	32
Biomass	348	13
Air source heat pump	879	10
Ground source heat pump	716	07
Solar thermal	970	07
Small Wind	98	0
Total	3151	76

Number of MCS registered installations per technology

Technology type	Cumulative number	Installed Oct 14
Solar PV	617240	12979
Biomass	8161	520
Air source heat pump	32275	639
Ground source heat pump	9151	120
Solar thermal	7148	83
Small Wind	4791	02
Total	698658	14534

(Figures supplied by Gemserv)

Generation tariffs for Solar PV

Tariff band	FiT rates (p/kWh)
<4kW	13.88
>4-10kW	12.57
>10-50kW	11.71
>50-150kW	10.34
>150-250kW	9.89
>250kW-500kW	6.38
Standalone	6.38
Export Tariff	4.77

Domestic RHI tariffs

Technology	Legacy applications (p/kWh)	Applications submitted 01/01/15-31/03/15
ASHP	7.3	7.3
Biomass boilers	12.2	10.98
GSHP	18.8	18.8
Solar thermal	19.2	19.2

Tariffs apply to all eligible installations installed since 15 July 2009

Green Deal

Month	Assessments	Live GD Plans
Nov 14	32734	722
Total	422436	3961

Green Deal supply chain

Month	Assessor organisations	Providers	Installers
Nov 14	-6	2	-110
Total	398	176	2539

(Source: DECC)

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	0.48 per litre	2530 litres	£1,214
Wood pellets	4800 per tonne	94	24300	235 per tonne	5 tonnes	£1,175
Natural gas	1 per kWh	90	25300	0.042 per kWh	25300 kWh	£1,062
LPG	6.6 per litre	90	25300	0.39 per litre	3833 litres	£1,495
Electricity	1 per kWh	100	23000	0.15 per kWh	23000 kWh	£3,450
*Air source heat pump	1 per kWh	290	7931	0.15 per kWh	7931kWh	£1,190
*Ground source heat pump	1 per kWh	360	6389	0.15 per kWh	6389kWh	£958
Dual mode system 1						
Oil boiler (30% of heat load)	10 per litre	90	7590	0.48 per litre	759 litres	£364
*Air source heat pump (70% of heat load)	1 per kWh	290	5552	0.15 per kWh	5552 kWh	£833
Dual mode system 2						
Gas boiler (30% of heat load)	1 per kWh	90	7590	0.042 per kWh	7590 kWh	£319
*Air source heat pump (70% of heat load)	1 per kWh	290	5552	0.15 per kWh	5552 kWh	£833

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.

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)	Less than 200 kWth	Tier 1: 6.8 Tier 2: 1.8	20
Medium biomass	Solid biomass: Municipal solid waste (inc CHP)	200 kWth and above, less than 100 kWth	Tier 1: 5.1 Tier 2: 2.2	20
Large biomass	Solid biomass: Municipal solid waste (inc CHP)	1000 kWth and above	2.0	20
Small ground source	Ground source heat pumps, water-source heat pumps, deep geothermal	Less than 100 kWth	Tier 1: 8.7 Tier 2: 2.6	20
Large ground source	Ground source heat pumps, water-source heat pumps, deep geothermal	100 kWth and above	Tier 1: 8.7 Tier 2: 2.6	20
Solar thermal	Solar thermal	Less than 200 kWth	10	20
A2W heat pumps	ASHPs	All	2.5	20

(Source: OFGEM)

Domestic RHI deployment

Technology	Accreditations (Apr - Oct 14)	% of total
ASHP	4954	37
GSHP	2050	15
Biomass	3062	23
Solar thermal	3261	24
TOTAL	13327	100

(Source: DECC)

What data would you like to see on this page?

email:

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Who: Jonathan Bareham, operations and sales manager, Go Green Systems

What: Go Green is a residential and commercial PV installer operating throughout Shropshire, West Midlands and Mid Wales

Sonic boom: Jonathan Bareham, Go Green Systems, is enthusiastic about the business potential of the company's new partnership with Panasonic and its Virtual Solar Platform

Seeing the bigger picture

Monday

It's a typical Monday morning in the office, clearing through emails and new enquiries that have come in over the weekend. I usually meet with Tom Smith (director) and run through what is planned for the week. Late morning I turn my attention to a new large commercial development project that we've recently won, checking up on the progress we've made so far and our next steps. The afternoon is taken up with a survey for a domestic client, which identifies a number of miscalculations and inaccuracies from a previous survey conducted upon the property. These include shading factors given with no sunpath diagrams and several unrealistic figures supplied to the homeowner.

Tuesday

Following on from Monday I investigate the domestic installation further, concluding that the installer allocated to do the installation had not taken into account the main fuel source at the property or more likely had ignored it! The LPG boiler would undoubtedly knock the EPC score down and after an assessment we found that the property would not even get to a score of 39, far short of the required D rating. In order for the client to reach the grade they would need to insulate one of the floors and replace the boiler for a new condensing unit. This is very concerning because they are having incorrect EPCs conducted on their systems . In the afternoon I go to a recent LED lighting contract to complete our work and site clear up.

Wednesday

A day out of the office today, along with Tom and the installation team I attend a training course run by GB-SOL in South Wales. During the visit we are able take a close look at the manufacturing process of a very unique solar product, Roof-integrated System (RIS), a completely sealed solar roof that incorporates a structural mount and frameless laminates. It is always great to have the opportunity to see the production process, especially as it is a homegrown product with everything manufactured in the UK. We all get the opportunity to build our own RIS kits during the training in readiness for a new project in Conwy, North Wales. The project consists of 66 houses, seven different house types and seven different array types . Needless to say, the project is quite complicated.

Thursday

Today is a mixture of surveys and office work, starting with completing customer quotations, but I'm soon inundated with emails that require my attention and response. We are in the process of connecting with Panasonic to be part of their new interactive solar platform for UK homeowners, launched through a partnership with Generaytor. It's great to get support from a company of this size, especially when you see how small we are. Finally I check the progress of two planning applications that we have at present for solar ground mounted arrays.

Friday

Friday is an easier day with only two surveys to complete, one domestic and another larger contract. The afternoon is taken up by meeting with the DNO regarding an upgrade to a supply. The upgrade is for a small engineering company that is expanding. Having recently built a new work shed facing due south, it is perfect for a 10kWp system. As soon as the DNO can get the 3-phase connection done we can hopefully proceed with the installation. Finally I quickly have to pop back to the office to reply to an email with details for Generaytor so that we can get the on-line platform set up between ourselves, Panasonic and Generaytor.

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