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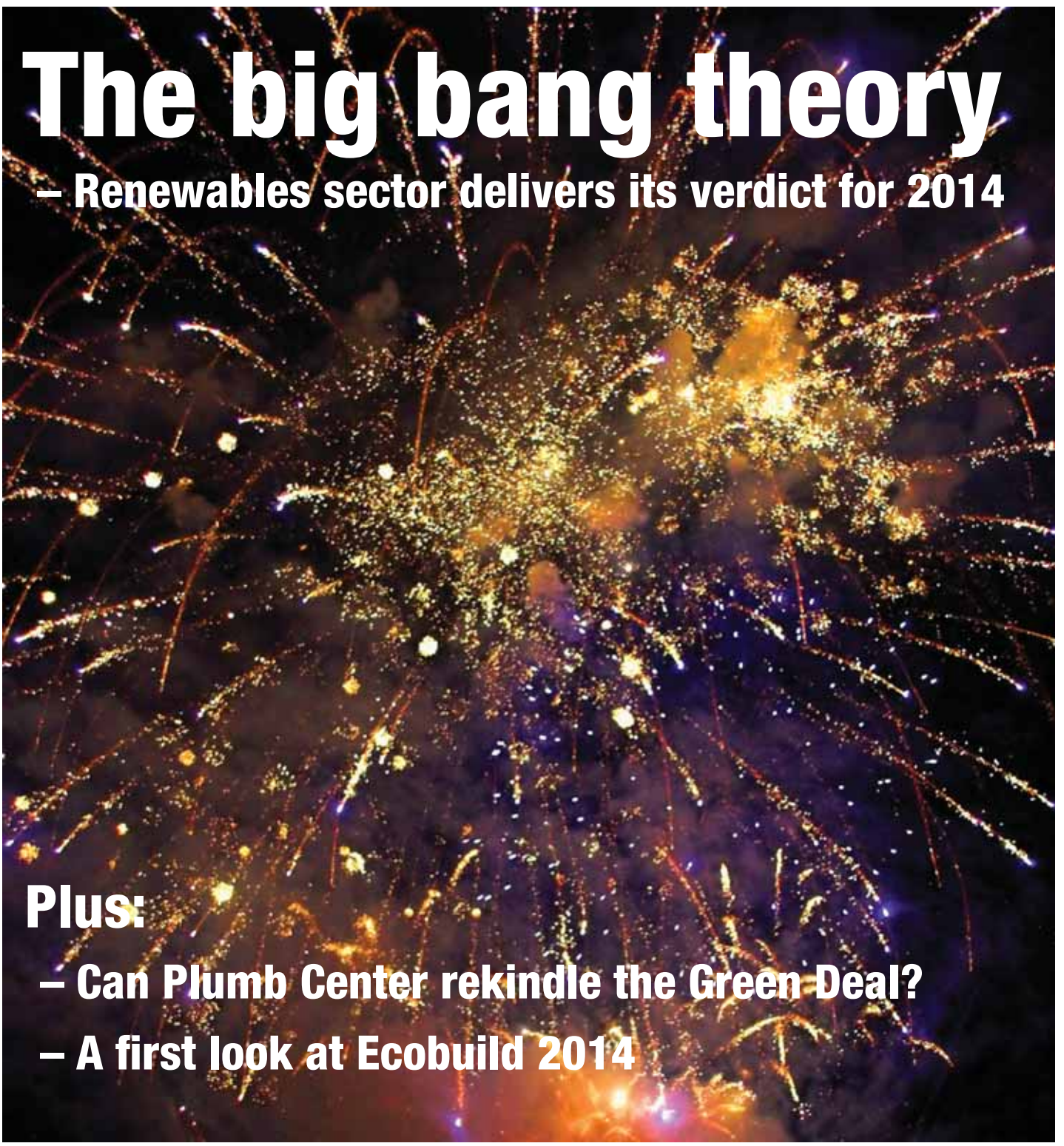

# The big bang theory

## – Renewables sector delivers its verdict for 2014

## Plus:

– Can Plumb Center rekindle the Green Deal?

– A first look at Ecobuild 2014

NEW RHI DOMESTIC TARIFF SET TO ENERGISE INSTALLER MARKET

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# Bridge over troubled water

With the end of 2013 now firmly in sight, there will be a fair number of readers eager to see the back of another stormy 12 months for the sector.

Forced to contend with another unwanted delay to the domestic RHI earlier in the year and its associated cost to businesses, installers have also been unable to reap the full promise of Green Deal following disappointing levels of uptake. All this compounded by a recession stubbornly refusing to let go and political infighting over energy policy.

But for those thinking that this is the winter of our discontent, things couldn't be further from it.

For the sector has yet to be presented with a challenge it has not surmounted, nor a setback which has not been overcome. The hurdles of 2013 are no more than has come to be expected by a rapidly-maturing industry more balanced, resilient and sure-footed than we have ever seen.

We end the year with energy generation firmly in the spotlight and microgeneration marching forward as a serious contender. What was once a luxury or peripheral technology is rapidly becoming a real consideration for hard-pressed homeowners looking to cut bills, through to a corporate world desperate to mitigate the threat of blackouts later in the decade as retired generation capacity is inadequately replaced.

Political necessity should also see the domestic RHI – a global first – finally launched during the first half of 2014 giving the renewable heating market a long-awaited shot in the arm.

On another positive note, REI enters the New Year with its exclusive MCS partnership growing from strength to strength. 2014 looks set to yield an expansion in our working relationship with several exciting areas for further collaboration serving the needs of you, the installer.

And finally, may I wish you all a happy Christmas and a prosperous New Year on behalf of team REI.

## Editorial panel members


Andy Buchan, CEEC, Future Renewable Energy


Andy Boroughs, Organic Energy


Garry Broadbent, Lifestyle heating


Cathy Debenham, YouGen


Ryan Gill, Evoco Energy


Liz McFarlane, Zenex Solar


Steve Andrews, Ecoskies


Phyllis Boardman, Green Deal Consortia


Robert Burke, HETAS


Gideon Richards, MCS

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**'The conversation about energy efficiency has never been as relevant as now" Tim Pollard, Plumb Center p7**

# Industry hits back at Cameron pledge to review green taxes

Industry leaders have reacted with dismay at David Cameron's recent announcement that he will 'review' green taxes levied on energy bills.

The prime minister has promised to look into the proportion of consumer's electricity and heating bills currently allocated to funding renewable technology and energy efficiency schemes in an attempt to cut the cost of energy. The government has come under increasing pressure to act after the majority of the 'big six' energy suppliers announced price rises of between 8-10 percent.

The Renewable Energy Association (REA) has urged the government not to reduce levels of investment in green energy which is vital in reducing the country's dependence on fossil fuels and meeting carbon reduction targets.

The Department of Energy and Climate Change was quick to release its own briefing reassuring investors that support for renewables would not fall within the scope of any levy review but Cameron's pledge appears to have unsettled the industry nonetheless.

REA chief executive Dr Nina Skorupska said: "Politicians and the media are simply wrong to say that green energy is to blame for pushing up bills.

"It is the ever-increasing cost of gas which has been the main cause of rising bills in recent months and years. With more energy efficient homes and more home grown renewables we become less exposed to the volatile gas markets."

Ian Glover, general manager of ReneSola UK, added: "Renewable energy regulations are partly blamed for the size of UK energy bills. While it's true that subsidies to support green development add around £50 to a household bill, that's just 3.7 percent of the average UK household bill (£1,353).

"The energy price hike only reinforces the benefits of alternative energy sources, and solar energy is well placed to help home owners fight back against spiralling energy costs.

"Gas and electricity prices, as the prime minister has said, are unpredictable – both here and in much of Europe. But we have the tools to fight the hike."


# Renewable energy to save UK business £33bn by 2030

Electricity and heat generated from recycled food waste, wind turbines and solar panels will save UK businesses £33 billion between 2010 and 2030 and cut carbon emissions significantly, a new study has revealed.

The study, commissioned by energy consultancy Utilyx, reveals that by 2030 on-site renewable energy generation will contribute 14 percent of the UK's energy needs –compared to the 9 percent generating capacity recorded in 2011.

Combined heat and power (CHP) and energy from waste are predicted to deliver the greatest savings to UK businesses by 2030 (£20bn) but solar and tri-generation (the simultaneous creation of cooling, heat and power) are expected to grow the fastest.

The research was based upon a forecast model which analysed the uptake of six major decentralised energy technologies across 23 sectors including retail, banking, manufacturing, utilities and construction. It found that decentralised energy will deliver total carbon emissions savings of 350 million tonnes by 2030.

Mark Stokes, managing director for Utilyx's asset management business, said: "This report shows that on-site energy generation will play an increasingly important role in our future energy mix. Traditionally businesses and organisations have focused on one aspect of energy management – typically procurement or energy efficiency.

"The report reveals the need to look at the bigger picture and adopt a joined up approach including considering on-site energy generation. In a climate of volatile and rising energy prices, decentralised energy can help businesses save money, reduce carbon, and provide energy security."

# DECC launches RHI installer training support scheme

A new £500,000 fund aimed at raising the skill set of domestic heating engineers so they can install and maintain renewable heating systems has been set up by energy secretary **Ed Davey**

GTEC Training has been awarded the contract to administer the scheme which will be distributed via two streams.

**Stream 1 – Cross-skilling support**
£250,000 is available to support installers already qualified in heating and/or plumbing obtain qualifications in installing heat pumps, solar thermal and biomass. Vouchers will be valued at 75 percent of the total cost of training up to a maximum of £500 per voucher. Vouchers will be limited to five per company and issued to the candidate, enabling them to redeem their voucher on a qualifying course of their choosing.

**Stream 2 – Apprentice support**
£250,000 is available to support apprentices include renewables in their apprenticeship programme. Funding will be available to apprentices who have already selected a particular renewable technology to complete their apprenticeship programme but wish to add additional technologies.

Training providers can drew down the value of the voucher on completion of the training course through the scheme administrator.

Based on the results of this initiative, the Department of Energy and Climate Change (DECC) says it will look to increase funding and support for the supply chain.

Energy Secretary Ed Davey said: "This voucher scheme is aimed at the engineers who give us their expert advice on the heating system in our home - often over a cup of tea in the kitchen. Our research shows us that these men and women are the people we trust when looking for advice on how to keep warm in a reliable and affordable way. But too often, they are only able to talk about what they are most familiar with - and that usually means gas or oil-fired boilers.

"By taking advantage of these training vouchers, these engineers will be able to extend their advice to renewable heating options ahead of the introduction of the domestic Renewable Heat Initiative in Spring next year."

Mark Krull, marketing director at Logic4training, which played host to the scheme's launch event in October, said: "DECC's Renewable Heat Incentive training support voucher scheme offers a great boost to installers looking to take advantage of the market opportunities presented by the domestic RHI. This should encourage more engineers to train in related technologies, ensuring end users have access to skilled trades people to help them realise the cost and carbon saving potential of renewables."

Installers can visit **www.rhitraining.co.uk** for more information or follow **@rhitraining** on twitter.


**Support group: L-R Tom Hunisett, TSG Building Services - the first installer to receive a Training Support Voucher, Energy secretary Ed Davey and Griff Thomas, GTEC Training**

## Events

Ecobuild
04-06 March 2014 ExCel, London
**www.ecobuild.co.uk**

Energy Efficiency Exhibitions plus Heating & Plumbing Roadshow

9 September 2014
Westpoint Arena, Exeter

11 September 2014
Ricoh Arena, Coventry

16 September 2014
Highland Centre, Scotland

18 September 2014
Event City, Manchester

23 September 2014
Sandown Park, Surrey
**www.energyefficiencyexhibitions.co.uk/**

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# Saving the nation

Plumber Center has launched a series of policy recommendations aimed at driving the uptake of energy efficiency measures. **Tim Pollard**, Plumb Center's head of sustainability and the paper's key author, tells REI how he hopes it will reignite the market and jump start Green Deal

On Monday 28 October, guests and industry representatives were invited to the House of Commons for the launch of Plumb Center's manifesto for stimulating the energy efficiency market. With Green Deal still bedding in, and the threat of reducing energy consumption slipping down the public consciousness, Tim Pollard spotted the need for a set of practical solutions devised by those at the heart of the sector.

"The document augments current policy and fills the gaps," he said. "We are not arrogant enough to think that we can change the world but we are not seeing the levels of uptake we had all hoped for. Plus, the conversation about energy efficiency has never been as relevant as now, after all the recent energy price rises.

"We are trying to focus attention and provoke discussion in the run up to next year's general election which inevitably drives new policy ideas and strategy. Where we can add value to that is with our knowledge of the industry. The manifesto is obviously Plumb Center's view but I believe it reflects an industry-wide consensus from conversations I've had with people working in energy efficiency."

The manifesto's key recommendations include an increase in stamp duty for the least energy efficient homes, an equalisation in the rate of VAT for energy efficiency improvements and legislating to link Part L building improvements with the requirement for a Green Deal assessment.

The proposals are both consumer and installer focused to simultaneously kick start demand and supply for energy efficient measures. The manifesto also stresses the need for increased government funding for installers seeking to become Green Deal and/or ECO accredited following Plumb Center's calculation that an individual with no relevant qualifications would face costs of up to £16,000 to enter the marketplace.

"Nothing is very radical in the document but we believe each recommendation can have a significant impact on the marketplace," added Pollard. "It is by no means perfect but we are trying to reflect reality and what is actually deliverable.

"Funding such as the £500,000 pledged towards RHI training is welcome and we encourage our customers to benefit from it. But, in all honesty, it's fairly small scale and limited in scope. Many people were surprised by the calculation we made in the paper for an untrained person but that is an indication of the reality which we face.

"All of the recommendations should have some resonance with REI readers by helping them understand where we are as an industry and what we can do to improve and increase uptake."


**Pollard proclaims: Plumb Center's head of sustainability sets out proposals to increase the supply and demand of energy efficiency measures**

## Summary of recommendations

1. Increase in stamp duty for energy performance rated F and G homes
2. An 'MOT for the home' pilot with local authorities
3. Equalisation of VAT for energy efficiency measures to the lowest rate
4. Reforming the Winter Fuel Payment Scheme to divert funding to the Affordable Warmth Scheme
5. Mandatory display of energy certificates for all buildings
6. Linking Part L building improvements and Green Deal
7. Increase in the scope of Landlord Energy Saving Allowance to reflect approved Green Deal and ECO measures
8. A single Energy Efficient Technician Certification for installers to replace MCS and Green Deal certification
9. More funding support for installers
10. Simplification of competency registration

# Leaping ahead

Interest in community energy is rapidly growing presenting an untapped opportunity for installers, says Pure Leapfrog ceo **Robert Rabinowitz**


Photo credit: David Flower

**Finding finance: Social investment provider Pure Leapfrog has financed over 40 community renewable energy projects such as a biomass boiler at Camelford Leisure Centre, Cornwall**

Whilst the community energy movement is still small, it is growing three times as fast as conventional renewable energy. According to Respublica in its September 2013 publication The Community Renewables Economy, over the last decade community-owned renewable energy's UK generation capacity has increased by over 1300 percent. It predicts the sector will grow nine-fold to 550MW by 2020 based on current rates. If the government creates the right policy framework, we think the sector could grow to nearly ten times this size and over 5GW resulting in nationwide opportunities for the installation sector.

Community energy has the potential to disrupt conventional energy businesses. Anyone who doubts its potential for growth should take a look at Germany where it is estimated that community energy accounts for close to 50 percent of all energy produced from renewables. The community green energy movement in Germany has grown so much in strength that a Berlin-based energy cooperative is now bidding to buy the entire local power grid.



### Breaking barriers

One of the key obstacles to scaling up community energy has traditionally been the lack of access to conventional funding streams, which is where Pure Leapfrog has been quietly assisting organisations.

By providing low cost loans (financed by a credit facility from Big Society Capital), we have to date helped more than 30 installers progress project installations that may have otherwise stumbled for lack of funding.

Pure Leapfrog is a business-led charity whose work goes beyond providing innovative funding. Many projects have also benefited from legal and other professional expertise donated by our network of professional services partners to assist them with legal, technical and commercial issues. The network has advised on community share issues, financial modelling and roof leasing arrangements, as well as some more unusual planning or technology queries.

### Success story

A recent example of how Pure Leapfrog has helped a community scheme get off the ground was by providing a loan to a community cooperative taking over a leisure centre in Camelford, Cornwall, threatened with closure. The energy savings and RHI income from the purchased woodchip boiler were so significant that the centre would have closed without its installation, depriving hundreds of local school pupils of a swimming pool and causing the loss of the jobs of those who work there. This is one of more than 40 successful low cost projects we have funded.

Our portfolio of community energy loans includes primarily solar panels, but also biomass boilers, solar thermal, LED lighting and emerging heat pump projects. Remarkably, as a social investment provider, we are attracting mainstream investor interest due to the reliable returns being generated. Completed projects also show that for every £1 loaned out, over £4 of financial benefit is being created for communities in deprived areas, reducing fuel poverty and creating new revenue streams for schools, community centres and charities.

We have ambitious plans to scale up our activities in 2014 and actively encourage project referrals from installers which meet our loan criteria.

# New book casts fresh light on bio-energy

The UK can meet up to 20 percent of its energy needs from bio-energy, claims a new book written by **Stewart T Boyle**

*The Sleeping Giant Awakens* has been penned by the senior associate of South East Wood Fuels to allow the author to illustrate the potential of bio-energy in the UK and dispel several myths surrounding the decarbonising effect of using such fuel.

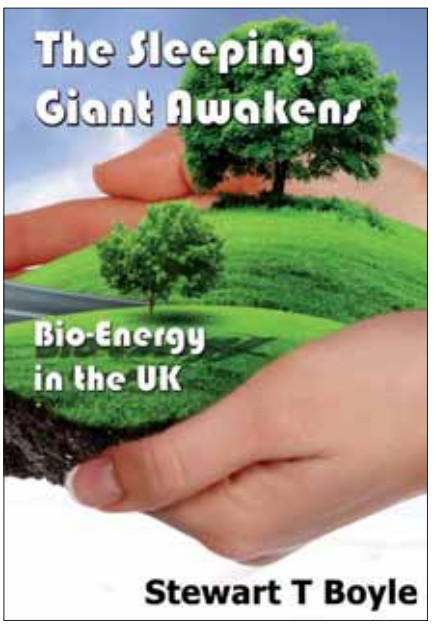
"Bio-energy has had its fair share of controversy over the past 18 months. If you believe some of the green NGOs then biofuels and biopower are worse than fossil fuels," said Boyle.

"Yet bio-energy offers 24-7/365 reliable power, heat and transport fuels and really innovative ways of using wastes, woodland residues and energy crops. So what is the true bio-energy story, what are the facts, and who and what lies behind the biofuels-biopower controversies?"

The book calculates how many wood heating boilers and anaerobic digesters we as a nation could utilise, gives examples of bio-energy at work throughout the economy, as well as practical tips on how to use it.

The author added: "If you want to know if we have enough wood and other bio-energy fuels in the UK, if bio-energy really does save carbon, and how to tap into the huge bio-energy potential then the book was written for you. As a former green activist, I'm not afraid to criticise NGOs either. I argue that we have 'lost the plot' on bio-energy and that, without bio-energy, it will be very difficult for UK renewables to meet their true potential."

To take advantage of a £2.00 REI reader discount offer for hard copy and digital versions, visit **www.oneplanetmedia.co.uk/OPM-publications** using discount code **LW2013SGA1**.



# Taking centre stage

**Ecobuild 2014** will deliver its largest showcase of renewable energy and microgeneration technologies ever, says show organiser UBM

At Ecobuild 2014 (04 – 06 March 2014, ExCeL London), installers will get the opportunity to get hands-on with the latest technologies and go away armed with knowledge about the right products to help customers save money and keep themselves ahead of the competition.

As always, the UK's leading manufacturers are due to be on the show floor with their interactive attractions, discussing ideas and technologies so installers can go away knowing exactly what to recommend to customers.

Plumb Center is returning with Practical Installer, which offers live demonstrations and advice on how installers can take advantage of the emerging renewable technologies market. Other top names include Mitsubishi Electric, Viessmann, Baxi and Worcester Bosch, Johnson and Starley and Lailey and Coates.

In 2014 the Ecobuild experience promises to be easier to navigate than ever before, thanks to the introduction of three core areas to the event. One that should be top of every installer's agenda is the energy part of the show featuring the Green Energy Zone sponsored by Rexel. Championing key energy issues and providing guidance and practical advice on policy and legislation, this area will include a range of features on renewable energy, resource management and energy efficiency.

**Spaced out: In addition to the two main arenas, Ecobuild will be divided into six new content areas including Green Energy to enable easier navigation at 2014's show**

Ecobuild 2014 will also feature another packed information programme, attracting over 600 speakers. At the heart of the programme is debate, learning and information exchange, led by internationally renowned academics, industry leaders and celebrity speakers. All speakers will now appear on the show floor and there will be two spectacular arenas to house the conference programme.

In addition to the two Ecobuild arenas will be six new content zones on the show floor. Building Performance & BIM, Refurbishment & Retrofit, Green Energy, Design, Water, Waste & Materials and Future Cities.

The Green Energy seminar programme is a good place to start as it provides the latest updates, and looks at the practical and technical issues involved in installing green technologies. This year's big talking points will include advances in energy storage technologies, the business case for PV at different scales, tapping into the Feed-in Tariff and an overview of the incentives, payback and regulatory drivers presented by the renewable market.

Hosted within the energy section of Ecobuild 2014, installers will be able to discover Solar City in association with SMA Solar.

Formerly known as the Solar Hub, Solar City will feature seminars and practical demonstrations covering all aspects of the solar PV market in the UK. Visitors can listen to live debates and practical case studies from industry experts. Some of the hot topics to be covered include:

- Integration of PV into buildings
- Schools and commercial buildings: education on the possible returns from solar PV
- Energy storage: possible solutions for large scale developments as well as domestic
- Zero carbon inverters
- How to educate consumers on the benefits of PV
- Smart metering

You can register your interest in attending at **www.ecobuild.co.uk**
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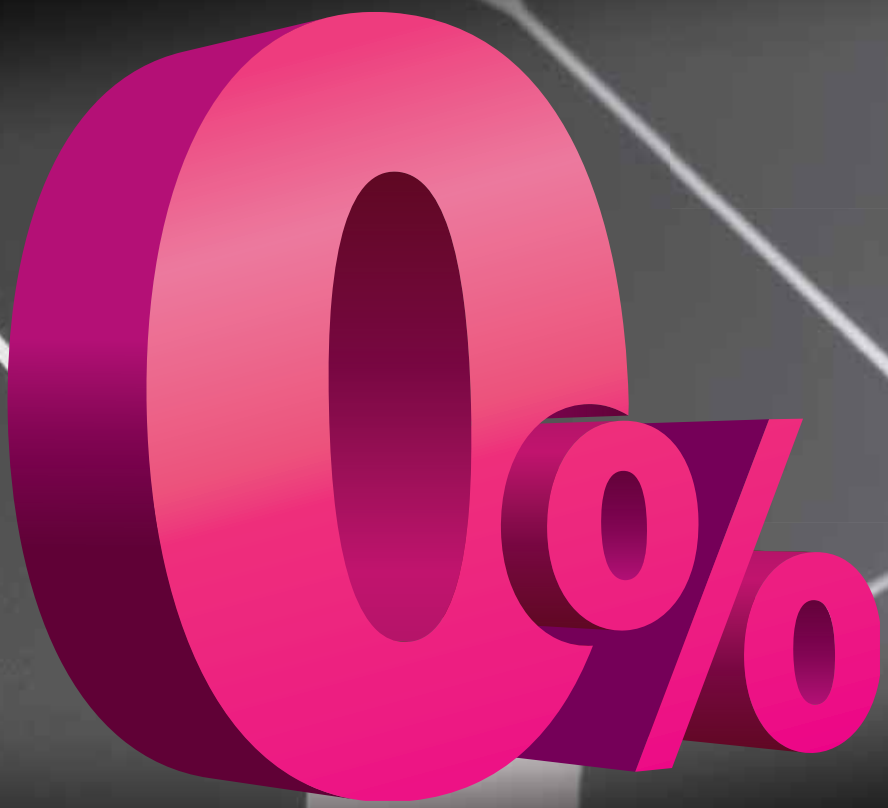


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# Showing initiative

The Microgeneration Certification Scheme (MCS) is shortly due to launch two key new initiatives to help installers get involved with the scheme, and take advantage of the opportunities offered by the forthcoming domestic-level Renewable Heat Incentive (RHI).

The first aspect is helping installers to better understand how to become certified and making it clearer how to upskill and re-skill in response to changes, such as the introduction of RHI. Last year we consulted industry on clarifying the criteria against which companies are assessed in order to gain certification. We had a formal public consultation on proposed changes, supported by a series of workshops with installers across the country. The scheme has taken on board all that feedback, and it's resulted in what we think is a much more straight-forward route to demonstrating competence.

Whilst the scheme will remain very much a company-level certification scheme, there will now be clear competence criteria associated to each technology's MCS Installation Standard (MIS). These criteria are based off the existing National Occupational Standards (NOS) and mapped to the existing Qualifications and Credit Framework (QCF). What that means in practice is that it will be much easier for companies to demonstrate to their Certification Bodies how the combined experience and formal training of each of their operatives demonstrates the relevant competence for the company to gain certification. This is a big step forward in making the whole process more transparent from the installer's perspective.

The scheme has also been doing a lot of work to modify the installer standards for the heat technologies (biomass, solar thermal and heat pumps) to make the standards fit for purpose to support domestic RHI. The MCS Working Groups, composed of installers, manufacturers and trade associations, have updated the standards to ensure that MCS heat technology installations can meet all the requirements that will enable government to make MCS the requirement for customers wishing to access the incentive. A public consultation took place in October, and the standards are now being finalised in light of the comments received.

All of the above initiatives are expected to be implemented by spring 2014, in time for the rollout of RHI. More detailed information, including the new standards, will be published on the MCS website in December 2013.

## Pollard's Patter

THROUGH THE EYES, AND GLASSES, OF **TIM POLLARD** HEAD OF SUSTAINABILITY, PLUMB CENTER

In case it missed your attention, there's been some recent dialogue regarding energy bills. As the inevitable annual price rises are announced, people are reminded how much of their disposable income is consumed by the cost of energy, and how the percentage appears to rise with every increase.

This situation provides us all with great opportunities to open the conversation with customers about how they might reduce their exposure to such increases, by looking at renewable energy and heating systems.

As unit energy costs rise, we can revisit our investment and return calculations with fresh enthusiasm. Whilst it would take a foolish man to predict the future, I'd wager that energy prices will continue to rise and will outstrip wage inflation by some distance.

All those sums quantifying the value of replaced energy can be re-calculated; all the return-on-investment calculations will provide shorter paybacks. The case is most compelling for those who don't have access to mains gas, where the cost of basic fuels has increased even more sharply.

The provision of space heating and hot water makes up 80 percent of most household energy bills and therefore provide householders with by far the biggest opportunities for savings, despite the oft-held ideas that unplugging phone chargers and not putting the telly on standby will slash bills.

So now is the time to tell the great British public, don't think about it as improving energy efficiency, think about the prospect of not wasting money!

# 2013 – What progress have we made?

**Robert Burke**, HETAS, reflects on a productive year and the improved outlook for the biomass sector

As we near the end of the year we start thinking about what next year is going to bring. It's looking increasingly certain that the domestic Renewable Heat Incentive will be launched in spring 2014. This can only be good news for the biomass and renewable heating industry which until recently has been slightly in limbo waiting for a firm announcement on a launch date. Despite this uncertainty, 2013 has been a good year for the biomass industry, and we have made great progress in strengthening HETAS as the only dedicated competent person's scheme for solid fuel and biomass.

A change in attitudes has meant that many consumers are starting to look at hybrid systems. The steady increase in oil, gas and electric energy prices has meant that householders are even more aware of their energy bills. Renewable forms of energy such as biomass, wind and solar are becoming even more popular as people look to minimise costs whilst reducing their carbon footprint. This shift in consumer behaviour has meant increasing demand for biomass installers, and also those who can design and install systems using more than one technology.

We are now more certain than before that the domestic RHI will be introduced next year, and HETAS biomass training courses are already in place for heating engineers who may have experience of oil or gas, but are looking to take advantage of the opportunities which RHI will create for biomass installations from next year. There will be no RHI payments for oil or gas installations, so adding a renewable technology to your existing skills could reap dividends in terms of new business.

Although we have been uncertain of the RHI implementation date, at HETAS we have been gearing up to be ready for the new legislation when it comes. In 2013 we introduced a new technical helpline which has been invaluable for HETAS registered installers. The feedback has been extremely positive, and it's another example of the support service that we offer alongside other technical information including the HETAS annual guide, and a technical handbook which we launched in the last 18 months.

A lot of the work we do at HETAS goes on behind the scenes, but it's probably the unseen work that's the most important! We represent the industry at both national and European level, and at the moment are working with OFGEM to make sure the RHI scheme works effectively for both installers and consumers. At a European level, we have been lobbying the European Commission on the Ecodesign and Ecolabelling projects. Much of the UK's legislation is now determined at European level, and HETAS plays a crucial role in representing the views of the solid fuel and biomass industry to the European Commission.

All this progress in 2013 means that we are starting to see increasing interest in renewables, and biomass in particular. With the thought that the domestic RHI may be only three or four months away, now is the time to make sure that we have enough installers trained and registered with the Microgeneration Certification Scheme (MCS) so that the industry can continue growing and meet demand for renewable technologies.

*A lot of the work we do at HETAS goes on behind the scenes, but it's probably the unseen work that's the most important*

*Two minutes with . . .*

**Who are you?**
Phil McVan, managing director, Urban Wind

**What do you do?**
We are a medium wind turbine project developer. Our teams provide a full-cycle delivery from planning and feasibility studies to construction and aftercare.

**Where are you?**
We are able to provide nationwide service throughout the UK, and we have company offices in both Scotland and the North West of England.

**How's business at the moment?**
The market is getting stronger as the B2B markets recognise the benefits of alternative energy against the backdrop of continually increasing fossil fuel based energy. We find ourselves in demand as wind turbines are being increasingly viewed as an attractive option. However, the complicated local planning procedure is often difficult to negotiate.

**How could it be better?**
We need a broader public and political acceptance that renewable energy technologies are here to stay. In particular, local planning authorities need to accept the need for renewable energy generation.

**Who do you admire in renewables?**
I really admire Dale Vince, the founder of Ecotricity, as he has pioneered, in extremely difficult circumstances, the growth of wind energy in the UK.

**What's the best business advice you have received?**
"Opportunities don't look like opportunities until you pick it up and polish it to become real" – it takes a great deal of work, and attention to detail, to build an initial opportunity into a successful project.

**How are you going green?**
As well as downsizing much of our vehicle fleet to smaller hatchbacks, we also actively encourage a cycle-to-work scheme. A significant number of our staff cycle to and from work each day, and I like to do so myself as often as I can.

# Q&A

## SEAN SOWDEN

Go Geothermal

**What have got planned for the next 12 months?**
To further enhance our offering by continuing to provide unrivalled products and a service which is second to none. We've got some exciting new products which we'll be releasing soon, re-enforcing our status as the number one supplier of all things ground and air source heat pump, district heating and biomass.

**What do you see as the growth areas in Renewables?**
With the recent government announcement for the domestic RHI for heat pumps along with an increase in the commercial sector, I think heat pumps will be very strong next year. Biomass and district heating will continue to show good growth.

**How is your company cutting its carbon footprint?**
Our Midlands' office is run purely from renewables (both heat and electricity) and we hope to introduce measures at our Head Office in County Durham in the very near future. We also buy from British manufacturers wherever possible which significantly reduces the carbon footprint of our product offering.

Sean Sowden is a director at Go Geothermal

# National treasure

**Steve Pester**, BRE, provides an update on The National Solar Centre (NSC) since its opening last April

The NSC has been busy on a number of fronts, as usual.

You may have already read in the media that our outdoor test site is being developed at the Eden Project, near St Austell. The plan is to get the site up and running in the first half of 2014, performing several types of test including:

- Long term side-by-side module output tests
- Whole system tests, including different types of inverter
- Module cleaning studies
- Orientation and tilt tests

These will be rigorously performed scientific tests and will provide an excellent source of real performance data for the UK climate.

Alongside these very practical activities, the NSC has been helping with government policy by co-chairing the Solar PV Strategy Working Group and producing reports on anti-dumping and base line costings. You may also have noticed the excellent solar road map published by DECC in October, with input from the NSC. This lays out four key principles on which to base support policy for solar projects. Paraphrased, these are:

1. Support will only be given to projects which show value-for-money carbon savings
2. Support should deliver genuine carbon reductions, contributing to the UK's target of 15 per cent renewable energy from final consumption by 2020
3. Support should ensure that projects are sensitively sited, taking account of landscape, visual impact, heritage and local amenity and any community concerns.

4. Impacts on the grid must be assessed and addressed in any support policies.

These guiding principles should help to secure the future for PV by allaying fears and ensuring the wise use of public money.

# Installer is king, says Worcester, Bosch

**Neil Schofield**, Worcester, Bosch, is calling on the government to be more mindful of the integral part installers will play in the success, or indeed failure, of its energy efficiency policies

Schofield, the manufacturer's head of external and governmental affairs, argues that a lack of political consensus on how to reduce energy bills, and a perception within industry that policy is being dictated by the 'big six' suppliers, could leave those delivering schemes such as Green Deal sidelined, when they are in pole position to improve its outcome.

"With the Green Deal clearly at a critical stage, it is up to us to help the government deliver a system that works. At present, there are strong concerns that the Green Deal favours the big six energy suppliers, but we must change this approach and force the government to remember the installer is king.

"By changing the mindset of policy-makers, we can turn the Green Deal on its head, in order to position the installers as a 'one stop shop' for all energy efficiency enhancements."

He added: "We need to fix the bugs in the Green Deal on the government's behalf and push for action on the RHI (a clear launch date). We also need an assurance that the prime minister's pledge to roll back green taxes is not code for the scaling back of energy efficiency policies. In the meantime, it is imperative that we continue to give installers a voice."

TECH TALKING

# Heat pumps and domestic hot water

Heat pump trouble shooter **Bob Long** focuses on cost effective methods of providing domestic hot water (DHW) from a heat pump

Heat pump installations are steadily on the rise I am pleased to say and, provided our government sticks to its promise of delivering the RHI in this coming year, the continued rise in heat pump installations will continue.

In previous issues of REI, I have discussed a number of heat pump topics and, hopefully, how to avoid some fundamental problems. But DHW production is perhaps the most difficult commodity to provide economically from a heat pump.

Although there are a small number of 'high temp' heat pumps available in the market, the most economical output is always achieved at the lowest operating temperature.

Utilising low temperature water for heating a property isn't generally an issue, as a suitable choice of emitter will ensure adequate delivery of energy.

DHW is quite different, however, requiring higher temperatures at the point of use and even higher temperatures when stored, to eliminate the possibility of legionella, made safe through pasteurisation.

DHW supplying showers is generally needed at a flow rate of somewhere between 10 and 15 litres a minute, although power-showers are significantly more, and perhaps should be considered ungreen due to their high water and energy usage.

To create perspective with regard to the quantity of energy consumed in the production of DHW, a flow rate of only 10 litres/min will require an energy input of around 25kW. This is equal to the energy consumed by twenty five, single bar electric radiators!

At 15 litres/min, the energy requirement would be 37kW - assuming incoming water at 10°C.

This level of energy exchange is easily accommodated by a conventional type of boiler, but not so easily with a small domestic heat pump that is often dependant on a single phase electrical supply.

To meet periodic on-demand needs, DHW is heated by the heat pump over an extended period of time and stored in a stratification cylinder. This type of DHW storage employs the principal of the warmest water occupying the top section of the cylinder, from which the DHW is drawn as required. As hot water is drawn off the top of the cylinder, cold water enters at the bottom, heated by energy from the heat pump through an internal heat exchanger.

In this type of system, it is usual for heat pumps to operate at two different output water temperatures, differentiating between space heating and DHW, accomplished by a motorised valve, directing the output from the heat pump as required between the heating system and the DHW cylinder.

The water stored in the DHW cylinder can be maintained at a sufficiently high temperature for normal usage but, periodically, the contents of the DHW cylinder will require pasteurisation - usually accomplished by an electrical powered immersion heater capable of raising the temperature of the whole cylinder during the pasteurisation period.

The energy required to perform the pasteurisation process is by comparison expensive, and should be used sparingly.

With the advent of modulating-flame boilers, DHW production in a heat pump system can be made simpler and in some instances more cost effective. By employing a secondary energy source the required water temperature can be produced on demand.

The incoming water to the secondary boiler is of course economically pre-heated by the heat pump reducing the amount of energy required to reach the target temperature.

This method of DHW production combines the economics of a heat pump with the flexibility of a conventional boiler, eliminating the necessity for pasteurisation, as no DHW is actually stored.

# CURRENT AFFAIRS

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

The recent announcement that EDF are to build the UK's first new nuclear power station in 20 years is good news for the economy and for the long term future of secure energy supply. Unfortunately this will take at least 10 years to construct so we will have to rely on more conventional sources until then. The only thing that can be guaranteed is that energy prices will still rise! This gives added impetus to the energy efficiency and renewable energy industry. The high cost of energy makes the installation of energy efficient devices more imperative and encourages more use of renewable energy systems. If you can generate your own power on site, that is less power to import and makes the use of the storage systems that I mentioned last month more economic. It will be difficult to make a modern building completely off grid as the incoming power can provide for the peaks of the building's energy usage but it must make good capital investment sense to put as much renewable power into a building as possible. With the current incentives both in FiTs and the RHI there is an exceptionally good return on capital with the added bonus of being partly insulated from rising energy prices. There may yet be more added incentives to save energy as consultations have taken place on Electricity Demand Reduction and the recent Energy Savings Opportunity Scheme consultation is proposing audits for medium to large energy users with recommendations on energy reduction. If these are coupled with further incentives, then the energy efficiency industry could have a new lease of life.

# Talking point

**Liz MacFarlane,** Zenex Solar, critiques the four key challenges the PV sector faces if the UK is to see 20GW installed by the end of the decade

If you were at Solar Energy UK in October you would have heard Greg Barker's speech on the government's Roadmap to a UK PV Strategy. There is much to be pleased with and lots to look forward to.

Currently, we've installed 1.7GW of PV in the UK under the Feed-In Tariff; that's almost half a million installations. The government sees four key challenges to enable the UK market to reach its potential: cost reduction, carbon-effectiveness, sustainability and scalability.

I won't disagree. These are certainly hurdles to grid parity. However, I would also argue that they are challenges which in some respect were created by government and EU policy in the first place.

**Finger pointing: Zenex Solar's Liz MacFarlane says the government should take its fair share of responsibility for contributing to the problems faced by the PV sector**

Let's take challenge number one - cost reduction. Easy to say when Chinese module manufacturers have what is tantamount to legalised price fixing imposed on them via the minimum pricing agreement. The big Chinese producers are not struggling to sell their quota and must be heady over their increased margin but it really doesn't help the government's cause of driving down costs, particularly when Europe struggles for its own production capacity. Inverter and mounting kit manufacturers cannot reduce costs anymore, and I'm speaking from experience when I say distributor margins are way below what would be expected in other sectors. I think installers would say the same.

Regarding challenge number two - carbon effectiveness - I can only speak of our own crazy situation during the PV rush of 2011. With only six weeks notice of the FiT cuts, we air freighted 26 containers of panels from China to ensure our clients could meet their install demand. What a crazy situation for an industry whose very foundation is to help the UK meet carbon reduction targets.

With distribution network operator (DNO) support, clarity on pension schemes and tax liability then scalability should be possible. The UK could achieve Mr Barker's 20GW by 2020 ambition by simply utilising 16 percent of our commercial and industrial roof space.

# Broadening horizons

Whilst the commercial PV market is beginning to grow, this sector is still only realising a fraction of its true potential. **Hannah Bell**, technical advisor at PV distributor Krannich Solar, discusses how rethinking system configuration can open-up a wealth of installation possibilities

Many of the installers we speak to are making the transition from domestic to commercial installation. This progression is not without its challenges, of course, both technically and in terms of market conditions. Some of these factors are far easier to deal with than others, however, and one specific area where we find installers are creating unnecessary barriers for themselves is by misunderstanding how to make the most of a site, or even what constitutes a viable installation opportunity.

### The only way is… south?

We all know that, in theory, a south-facing installation is optimal due to its higher peak output, but what many people seem to underestimate is how productive a dual aspect system can be – i.e. only about 8 percent less than a south-facing array. Installing modules in an east/west orientation gives a longer generation window throughout the day, thanks to the east-facing modules harvesting the morning sun and the west-facing ones generating later in the day. This is ideal for commercial premises which want to use the energy they generate, as it gives a more useable production curve throughout the day – an excellent selling point for prospective customers.

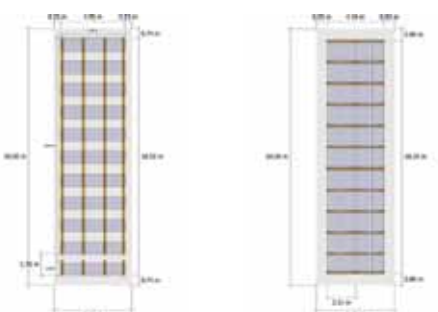
### East meets west

Using an east/west mounting system, such as the D-Dome solution by K2 Systems, also offers excellent space utilisation and can enable the installation of a significantly larger system. The low (10°) pitch of the K2 D-Dome system not only facilitates a low ballast requirement, making it ideal for roofs with a low weight threshold, but also negates or reduces the shading issues which other flat roof mounting systems can create. Whilst 10° is not the optimum generation incline, it still offers a good yield and can make an installation possible where it might not otherwise have been, or can simply enable consumers to get more from their roof space.

### The generation game

The comparison below between two systems shows that using an east/west configuration enables the installation of a larger system within the same space:

| Orientation | South | East/West |
|---|---|---|
| Number of modules possible | 33 | 44 |
| Generation capacity | 8.25kW | 11kW |
| Approx. annual system output | 7,319.1 kWh | 9,100.3kWh |
| Approx. annual output per m² | 61.0 kWh | 75.8 kWh |



These calculations are for a 120m² roof area, using 1640 x 990mm modules at a 10°inclination and are based on London weather and irradiation data.

As these figures show, utilising the east/west system enables the installation of 33 percent more modules and the system would have a 24 percent higher annual output capacity. So, whilst the efficiency of modules is slightly lower in an east/west orientation than when south-facing, this system comparison demonstrates that the overall system output can still be higher and therefore produce a greater ROI.

**New view: Using an east/west mounting system, such as the D-Dome solution by K2 Systems, offers excellent space utilisation enabling the installation of a significantly larger system, says PV distributor Krannich Solar**

### Current affairs

As with any installation, inverter choice is critical and – for east/west array splits – inverters with dual MPP trackers are ideal because the separate MPPTs ensure that the production of both orientations is maximised independently. This eradicates the crippling limitations you would experience with a single MPPT, multi-string configuration. Similarly, it's worth noting that dual trackers are also very versatile on single orientation arrays in the presence of module shading or unbalanced string loads.

### Keep your options open

Considering an east/west configuration is just one example of how choosing the right mounting solution can broaden the horizons of your installation work. It's all too easy to become preoccupied with what is considered optimal and underestimate how productive a system can be when you consider other options.

Ultimately, installing a system which best meets the customer's needs whilst delivering the maximum ROI can only increase consumer confidence in solar energy and contribute to the much needed growth of our industry.

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# Special delivery

With many thousands of people in the UK using solar PV to generate electricity from their roof, Panasonic's UK country manager, **Marc Diaz** explains how combining PV with air source heat pumps can further reduce electrical consumption and CO2 emissions

As the winter nights begin to draw in and the sunshine of this summer becomes a distant memory, it may come as a surprise to learn that the UK is in the midst of a solar boom. Solar power is the fastest growing energy technology in the world and this rapid growth shows little sign of slowing down.

**Key technology**

Solar capacity has increased 25 fold in less than three years with 1.7GW capacity installed under the Feed-in Tariff scheme - almost half a million installations across the country and it is a key technology for meeting the government's 2020 renewable energy targets.

The attraction of super energy-efficient heat pump technology also continues to grow. Despite their significant cost and energy efficiency benefits, air-to-water heat pumps have often been overshadowed by conventional heating methods and in the renewables market, its solar that continues to dominate.

**Cost effective solution**

With unpredictable weather forecasts and steep fuel costs continuing to be a factor, more and more households are researching cost effective heating solutions for their homes and how they could benefit from renewable technology.

ASHPs are easy to integrate into most heating systems and are also highly compatible with other renewable energy sources, including PV.

**Working together**

Panasonic has recently been involved in an interesting residential property where both solutions have been installed and are working together to provide maximum energy savings.

Originally a four-bedroom residential property situated in a village in Warwickshire, the homeowners enlisted the help of Nexus Building Solutions for a complete refurbishment and extra two-bedroom extension. The family were looking for a heating solution that would not only fit in well with the existing oil burner and radiators, but also provide reliable and superb-quality performance.

Specifying 4kW Panasonic 250W HIC panels to accompany Panasonic's 6kW T-CAP Monobloc Aquarea heat pump, Nexus Building Solutions has helped the property to benefit from extremely energy-efficient and cost-effective underfloor heating that runs through six different zones within the house. Supplying heat to an extension for an elderly relative, the bedroom, living room and downstairs bathroom, as well as a two-storey bedroom and living room, the entire family now all benefit from renewable technology. Not only is the house warm and cosy, but the extra energy generated from the solar panels is transferred straight back into the pump.

**Doubling up: Surplus energy generated by the solar PV is fed to an ASHP at this home in Warwickshire to further lower its energy consumption and carbon footprint**

**Energy efficient**

It is important however to choose the correct air-to-water heat pump for the job in hand. For example, heat pumps typically work much more efficiently at a lower temperature than a standard boiler system would. So they are often used in underfloor heating systems or larger radiators, which give out heat at lower temperatures over longer periods of time.

The Aquarea air-to-water heat pump range leads the market in performance and we have recently extended the range to offer a variety of solutions for the UK energy efficient housing market. Because the housing stock in the UK is extremely varied, not only with regard to the type, size and construction methods of the properties themselves, but also from a power point of view, we have developed a wide range that answers most requirements.

*ASHPs are easy to integrate into most heating systems and are also highly compatible with other renewable energy sources, including PV*


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# Boiling point

**Steve McAllorum**, sales director at Eclipse Magnetics, gives an insight into how magnetic filters can improve the efficiency and lower carbon emissions of any heating system

The majority of sludge in a central heating system is ferrous in nature and therefore magnetic filtration is one of the most effective ways of removing it. Left unchecked it can result in underperformance of the system and even blockages in the heat-exchangers, pumps and radiators as well as poor circulation, radiator cold spots and corrosion.

Conversely, fitting magnetic filtration can improve energy efficiency by up to 6 percent and reduce maintenance, whilst significantly extending boiler life.

A critical element of an effective filter is design of the magnetic core, as it is vitally important that the water in the system flows around the core in such a way that the high performance magnet is able to collect the maximum amount of black iron oxide.

One such product is Eclipse's Dual Flow Technology which is designed to ensure maximum exposure to the magnetic core thus ensuring most contamination is collected on the first pass.

As water circulates through the BoilerMag, black iron oxide contamination is attracted to the magnetic rod and is removed. The design of the magnetic core and high intensity magnet removes even the smallest particles.

Cleaning is easy by simply removing the contaminated cartridge from the bowl. The attracted contamination can then be quickly and easily removed.

*Fitting magnetic filtration can improve energy efficiency by up to 6 percent and reduce maintenance, whilst significantly extending boiler life*

As not all contaminants are ferrous, so we incorporate a specially designed non-block mesh barrier to ensure that non-magnetic debris is also captured, in addition to the iron oxide.

Feedback from installers is that ease and speed of installation is a major factor why they like the product, partly because of its ability to fit all standard pipe sizes and its 360° adjustment enabling it to be fitted to any angle of pipework. It is designed so it can be fitted in-line without having to adjust pipework. Installers like a product they can trust and one that is going to be valued by their customers, which is why we back it up with a three year guarantee.

**Heavy metal: As water circulates through the BoilerMag, ferrous sludge is removed via magnetic filtration, says the product's manufacturer Eclipse Magnetic**

With significant benefits in terms of energy efficiency and cost effectiveness to install, high performance magnetic filtration is an excellent way of optimising the efficiency of a central heating system.

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# Enemy within

Glasgow-based **UrbanWind** has called for a major overhaul of Scotland's planning system in a bid to increase the number of new wind projects and ensure the government's green targets are met

The company warns that long delays in the planning process are blocking vital investment in renewable technology – which has the potential to help create 40,000 jobs in Scotland – as firms are deterred by the lengthy planning process that exists in the country at present.

UrbanWind issued its warning following the publication of an Audit Scotland report looking at how the country is progressing in meeting ambitious government targets to source 30 percent of its total energy consumption from renewables by 2020.

Paul McCullagh, chief executive of UrbanWind, says: "Looking specifically at the small and medium wind energy sector, there is undoubtedly strong investor support and a definite appetite from companies, like UrbanWind, to make a significant contribution towards achieving these targets.

"However, the two biggest obstacles we currently face are unrelated to the economy, or UK energy policy, as suggested by Audit Scotland. They are, in fact, the legislative process involved in gaining planning approvals and securing an economic connection to the national grid.

"There is a willingness on the part of the various distribution network operators to engage with developers to try to achieve economic grid connections.

"We are content that, with some additional investment from the Scottish government, current issues around grid connections could be alleviated to help achieve the scale of sites required for deployment to meet the Scottish government's targets."


**Double trouble: Cumbersome planning processes and a lack of economically viable grid connections risks jeopardising Scotland's ambitious renewable energy targets, says UrbanWind chief executive Paul McCullagh**

McCullough highlights a fear that turbine manufacturers and developers may decide to forego the Scottish and UK market if efforts are not made to speed up planning decisions. According to UrbanWind, with some cases taking over eight months to determine, Scotland and the UK significantly lag behind other nations in the length of timescale for deploying wind.

"Currently we are seeing planning decisions taking no less than eight months to determine and in some cases extending out to over a year," he adds.

*Onshore wind is a key part of the solution to the problem of meeting the UK's legally-binding EU emissions targets and Scottish government aspirations*

"If the Scottish government is to have any hope of achieving the targets then this situation has to be addressed, whether through additional resource to planning departments or a complete overhaul of the planning process, to allow determination of turbine applications to be made within the statutory time limits, which are certainly not being met currently.

"On a similar vein, we are hearing significant concerns from turbine manufacturers as to where we sit globally in the legislative process for planning and the significantly longer timescales for deployment in the UK as compared to other countries. This is something that they are not experiencing in other markets, where wind energy is growing strongly."

According to McCullagh, a change in attitude and policy is needed to see more wind turbine approvals with special dispensation given to renewable energy. Despite concerns about the visual impact of turbines, priority should be given to their impact on fighting climate changes and ability to quickly fill the looming electricity generation gap.

"Everyone should understand that regardless of how we produce energy, we need to ensure that, with the decommissioning of traditional fossil fuel-fired power stations, the lights do not go out.

"Nimbyism, I'm afraid, won't cut it. We understand that there is concern over onshore wind energy from some quarters. However, it should be pointed out that onshore wind is a key part of the solution to the problem of meeting the legally-binding EU emissions targets and Scottish government aspirations – as well as keeping the lights on."

# Future-proofing for renewables

With the difficult economic climate continuing to affect consumer spending, installing underfloor heating (UFH) and a heat pump at the same time could prove beyond some domestic customers' means. One solution for installers facing this issue is to design UFH with the option of integrating a heat pump at a later date, explains **Steve Nixon**, Nu-Heat's operations manager

The launch of the Green Deal and publication of proposed RHI tariffs will inevitably mean that interest in renewables increases although not all customers will be able to afford to install both underfloor heating and a heat pump in one go. However, if the UFH system is designed for the existing heat source but with the option of adding a heat pump at a later date, it presents an ideal opportunity for installers to secure future business.

**Looking ahead: Although an effective way to secure future business, making UFH compatible with the introduction of a heat pump at a later date requires an experienced system designer**

### Rising to the challenge

Future-proofing the UFH for use with a heat pump presents a challenge. On the one hand a boiler-fed heating system will be capable of providing high water flow temperatures and enough heat to ramp up and down, on the other hand the heat pump will operate most efficiently when supplying lower flow temperatures and running constantly. This can be overcome by an experienced system designer with an understanding of the design parameters for both technologies; it is not a standard design and should always be tackled by a professional company.

A good supplier will offer advice as to whether the property is suitable for underfloor heating and/or a heat pump. Both will always be suitable in a new-build and UFH can be used in most buildings that have been built within the last 20 years or have had insulation.

### Stringent criteria

However, the criteria for a heat pump are more stringent meaning a detailed assessment of the building's heat loss will be needed to determine whether or not a heat pump will provide sufficient energy to heat it successfully with UFH. Nu-Heat knows that design is crucial to performance and has developed tools to ensure the correct sizing of a heat pump in accordance with the MIS3005 design standard.

When the heat pump is eventually fitted, the low flow temperatures required by the UFH will allow it to operate at its optimum efficiency, achieve a good Seasonal Performance Factor (SPF) and keep running costs to a minimum.

*To allow a smooth transition between the boiler and heat pump, the installer should make sure that key components are accessible*

### Retrospective integration

Integration of the different technologies is potentially complex. To allow a smooth transition between the boiler and heat pump, the installer should make sure that key components (such as the blending valve) are accessible, as they will have to be changed when the heat pump is fitted at a later date.

Any heat pump system should be supplied with detailed drawings showing all mechanical pipework and valves, electrical schematics and installation manuals tailored to the individual model. When this design is then linked to a similar set of documents showing how the UFH should be integrated both mechanically and electrically, plus how to install it into the floor construction, the installation process is greatly simplified.

# Heated debate

**Alan Dunn**, Husky Heat Pumps' business development manager, addresses the burning issue of specifying a high or low temperature heat pump

Numerous brands are now producing high temperature heat pumps therefore negating the need for larger radiators. Is this a good thing? Or is it better to buy a low temperature heat pump and larger radiators?

The answer lies in applying the heat pump where it is strongest. Simply put, the lower the temperature the heat pump produces, the more efficient it is.

There is a further complication when using high temperature heat pumps and that is that the capacity of the unit has to be bigger, therefore adding cost. But understand this - the higher the temperature the heat pump produces, the lower the output in kW.

So why do brands promote high temperature heat pumps? I do struggle to answer this, however, one reason is legionella. The high temperature heat pump can perform this function without the need for an immersion heater which is a good thing on large commercial properties where high temperatures for hot water are needed more often than once per week. This is not enough, however, for a domestic customer to be convinced to purchase a more expensive, high temperature heat pump.

**Cool reception: Husky Heat Pumps' Alan Dunn advises against specifying high temperature heat pumps due to significant extra running costs**

We see the extra running costs of high temperature heat pumps (using smaller radiators) to be significantly higher than low temperature. In some cases we have seen over double the running costs. It is not a simple case of COP, it is also kW output when running so be careful!

Stick to the golden rule and a heat pump will perform well - The lower the temperature the more efficient the heat pump. Simple.

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HETAS RHI RHI

# School of thought

**Simon Holden**, co-founder of Euroheat, explains the training currently on offer for biomass and the types of installers most likely to benefit from this rapidly growing marketplace

With only a few months till its launch, installers with an interest in renewables should be gearing up for the RHI and this means training. For many homes, particularly those in rural areas, biomass could be a good option. The RHI's primary aim is to help off-grid properties access more affordable warmth - key customers for biomass.

Cash back is most attractive for properties that require over 25kWs of heat, the point that we consider biomass to be most viable, so, if your customer-base consists of those living in larger houses in the countryside, preferably with access to managed woodland, then wood heating should definitely be on your radar.

A word of caution, biomass is not a solution for every home or individual. Logistically, space is required to store the boiler and associated equipment, plus deliver the fuel if it is not already on site. Mentally, end users need to be fully briefed on what heating a home with wood entails; log customers, for example, will need to re-fuel their machine by hand; once a day when it's cold. If you specify biomass for the wrong client they will end up disappointed and your businesses reputation may suffer as a result.

**Biomass training**

HETAS' course specifically for wood biomass course is H005. Training delivers background information to enable an engineer to carry out feasibility studies, professionally advise the client, consider fuel type and storage options, as well as design systems and installations to suit varying site circumstances. Covering systems from 5kW to 100kW it is ideal for building services engineers looking to take advantage of both the domestic and commercial RHI.

*For customers to achieve optimum efficiency, you will need to be able to properly, and confidently, educate them about their boiler*

**Back to school: Euroheat delivers HETAS courses, recognised by the MCS, at its training and exhibition centre in Bishops Frome, Worcestershire**

*Mentally, end users need to be fully briefed on what heating a home with wood entails*

For smaller properties there is the option to choose a stove that also has boiler capabilities. Be careful here because most log stoves are not currently MCS accredited and therefore not covered by the RHI – we supply one, the Riko Evo Aqua. To install this equipment, HETAS' Installation of Wet Appliances (H004) course is essential, providing candidates with the knowledge and skill to fit solid fuel appliances with some form of water heating and allowing them to self-certificate under the Competent Persons Scheme (CPS).

Pre-requisites for H004 and H005 include suitable experience in heating and plumbing; Part G Unvented Hot Water is a requirement. For installers without the necessary background, there's a H005 one day introductory course, which covers the necessary Building Regulations. If you plan to install the metal chimney or flue, you'll also need H006.

It's not just about technical competence. Biomass, more than the other renewable options, does require a level of end-user knowledge. For customers to achieve optimum efficiency, you will need to be able to properly, and confidently, educate them about their boiler, its operation and maintenance. Fuel is key here; low quality or wet wood will lead to an inefficient boiler.

Beyond technicalities, customers will be looking for advice and a steer when it comes to the RHI. If you can help them apply for the scheme (as many of our commercial installers do) this will certainly work in your favour. The more helpful you can be, the more likely you are to make a sale.

# Fortune telling

Industry leaders deliver the prognosis for the UK renewables sector over the next 12 months

Predictably, most of the hype for the next year surrounds the introduction of the domestic RHI due in spring. For the first time, homeowners will receive a financial incentive for the renewable heat they produce, greatly stimulating the market. Although deliberately designed not to deliver the same returns as the Feed-in Tariff, thus sparking an identical and unsustainable boom in demand, the industry is nevertheless gearing up for the fuse to be lit on increased consumer interest in heat pumps, biomass and solar thermal.

Claire Campbell, product marketing manager at **Dimplex Renewables**, explains:

**Top tip: According to Clare Campbell of Dimplex Renewables, 2014 will be the year of the air source heat pump due to the attractiveness of its tariff level under the domestic RHI**

"Obviously all eyes will be on the RHI and it will be fascinating to see the initial uplift once the scheme finally comes into force. I'm confident it will stimulate the market for domestic renewables solutions and that's good news for manufacturers, installers and homeowners alike.

"I also firmly believe we will see a marked increase in the take-up of heat pumps next year. Tariffs look good across all technologies under RHI and with support from the scheme, more efficient products, lower payback periods and better knowledge amongst installers, 2014 could be the year that air source heat pumps really take off as a viable source of domestic heating."

Peter Verkempynck, md of **Daikin UK,** is similarly excited about the impending launch of the domestic RHI having seen its introduction delayed a number of times since its conception in 2010. He states: "As we approach the end of 2013, a year which has seen the renewables industry kept on tenterhooks as the government delayed the domestic RHI scheme, we are now looking at a new year which will be vital for the success of renewable heating technology. With the non-domestic and domestic RHI both in effect in 2014, the RHPP still helping to subsidise the cost of installations and the Green Deal making slow but steady progress, now is the time for the government to start delivering on its promises."

In addition to heat pumps, both Euroheat and HETAS predict a significant increase in demand for biomass under the RHI.

Bruce Allen, chief executive of **HETAS**, says: "In 2014 we anticipate that the domestic RHI will really stimulate the growth of the biomass heating sector. HETAS has been working together with OFGEM and the government helping to ensure an effective and workable scheme for consumers. We're already seeing much more interest in biomass training and MCS registration, and expect this to increase before the anticipated launch of the domestic RHI in the spring of 2014."

Simon Holden, **Euroheat's** co-founder, feels financial returns under the RHI will be particularly attractive for larger domestic installations of above 20kW. In a cautionary word, he also stresses that the success of the scheme and the reputation of the industry will rely on the quality of installations.

"2013 was a good year for commercial-scale biomass thanks to the RHI and I hope that its domestic incarnation in 2014 does the same for smaller boilers. The tariff levels that have been set are encouraging and sensibly draw the right kinds of properties to the right kinds of technology – under the RHI biomass stacks up best from 20kW – 45kW; in the main, anything under this figure is probably better suited to an alternative technology.

"What's key is that installers and consumers understand that biomass heating takes careful consideration, depending on the customer. Miss-specifying biomass is the worst thing that can happen – a few unsatisfied customers and many people will write it off. The way biomass is presented to consumers is also key. Thanks to the RHI,

Continued from page 35

biomass is an investment and the green bit's a happy by-product."

Cathryn Hickey, executive director of the **National Skills Academy for Environmental Technologies,** says her organisation will be on hand to help installers benefit from the RHI: "Renewables look set to get a real boost in 2014, particularly in terms of heat-based technologies. With the domestic RHI scheduled to launch next spring, it will provide real business opportunities for suitably trained installers. DECC's recently introduced training voucher scheme is an excellent opportunity to up-skill in RHI-related microgeneration systems at a greatly reduced price. Installers should take advantage of this scheme now so they're ready for the RHI. In the meantime, tell your customers about renewables and the benefits these present – we've produced a number of guides to help you do this. Installers educating consumers will help drive the RHI forward, helping end users feel confident in choosing greener ways to heat their homes."

2014 should also see a return to sustained growth in the PV market, according to Krannich Solar and Sibert Solar, as the sector continues to mature and put more daylight between now and the sudden crash which occurred in the wake of reductions to the Feed-in Tariff in 2012.

Kim Mann, chief operating officer, **Krannich Solar UK**, says: "Despite the obvious challenges which the market has faced throughout 2013, I feel that we are finally beginning to gain the kind of stability which we have all craved. There is now a real cohesion and mutual respect within the industry and I look forward to the continued development of this next year. The true value of PV is finally becoming more widely understood and recognised, largely in light of ever-increasing grid energy prices. I envisage that 2014 will therefore see some long-overdue expansion within the 50-250kW sector, as well as the slow but steady recovery of the domestic market."

Andy O'Leary, **Sibert Solar,** adds: "Here at Sibert Solar we believe that 2014 will bring continued and sustainable growth in the UK's renewable energy sector. Historical issues with poor FiT degression control, short-sighted/poor-quality installation practices and a volatile supply chain are hopefully behind us

## Business as usual

**Paul Hutchens**, managing director at **Eco2Solar,** believes that 2014 will see a shift in consumer mindset away from renewables being perceived as a peripheral technology to becoming a mainstream solution competing shoulder-to-shoulder with traditional sources.

"I believe that 2014 will see sustainable energy becoming 'business as usual' as opposed to a niche market," he says.

"The constant energy price increases are making homeowners, businesses and property owners take note of their energy use. In a recent survey by the Major Energy Users Council, 91 per cent of businesses believe that energy inflation is a major threat to doing business.

**New dawn: Paul Hutchens, Eco2Solar, is enthusiastic about renewable energy's prospects in 2014**

"2014 should see robust numbers of renewable and energy efficiency installations due to availability of incentives and regulations including Feed-in Tariffs, the Renewable Heat Incentive, Green Deal, Eco and new building regulations following the current consultation."

## Continental shift

**Richard Rushin,** UK sales manager for **Trina Solar,** predicts a fundamental geographic shift in the sourcing of PV modules as the EU/China minimum pricing agreement begins to filter across the global supply chain.

He says: "The EU-China solar trade agreement has changed the business landscape for solar companies. With a minimum pricing now in place, we are competing on quality and service. But there is also now a vital extra dimension in that both purchasers and manufacturers face stiff penalties if they breach the pricing agreement, something that could inadvertently happen without due care and attention. These penalties mean that purchasers must conduct due diligence on a provider's back office compliance team to ensure business security.

"We have already seen a third of Chinese companies previously trading with the EU pull out of the market since the agreement was made, largely due to the increased administrative burden. I expect even more will cease to operate in the European market through 2014."

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**Shining bright: Rising fuel costs will turn the spotlight on energy efficiency and renewables during 2014, says Plumb Center's Tim Pollard**

Continued from page 36

now and we can look forward to continued exposure and growth. We believe strongly that energy monitoring and management, including storage, will be key focus areas but we recognise that challenges will be faced relating to grid infrastructure capabilities and DNO/planning limitations. We look forward to working with and supporting the industry throughout and hope that 2014 is a positive year for all involved in the renewables sector."

Last but by no means least, energy efficiency also looks set to be a dominant theme of 2014 with **Plumb Center** rooting for the continued expansion of Green Deal. Head of sustainability, Tim Pollard, says: "With fuel costs on the rise again, lots of people are talking about the need for energy improvements. In 2014 we'd like the industry, the government and the public to come together to improve the efficiency of our buildings.

"We support all initiatives which aim to improve the energy efficiency of our homes, so we're excited by the launch of the domestic Renewable Heat Incentive (RHI) in the spring, and are looking forward to more Green Deal updates next year."

# Staying in control

**Garry Broadbent,** director at **Lifestyle Heating,** tips energy monitoring devices to be the big technological development in 2014 as consumers look for simple ways to cut energy consumption and utility bills.

"I feel that the new easy-to-apply energy monitoring equipment that is now coming to the market will be one of the key areas of technology during 2014 which has real potential to assist our industry," he says.

"These monitoring systems are able to move the application of energy efficient equipment and renewables forward at a great pace due to the visibility provided in highlighting easy-to-reach areas within a site where energy use can be reduced.

"Importantly many of these waste reduction applications do not need subsidies as the savings that are generated from the work they do make their application worthwhile. This alone should make the renewable installer sit up and take note as we move towards the next Year."

**Next big thing: Lifestyle Heating's Garry Broadbent highlights energy monitoring devices as a potentially lucrative business opportunity for renewable energy installers during the new year**

# Standard bearer

**Risk assessment: The industry must be swift to eradicate possible cowboys if it is to prosper under the domestic RHI, says Organic Energy's Andy Boroughs**

The renewable heating industry will enjoy sustained growth following the launch of the domestic RHI as long as strenuous efforts are made to maintain high installation standards, says **Andy Boroughs**, managing director of **Organic Energy**.

He adds: "With the right choice of renewable heating system and installer, householders will be reaping the benefit and so will the industry of the domestic RHI. But this opportunity comes with a risk - either that it is not properly geared up to cope with demand or that the market is flooded with inefficient systems sold by cowboys, as we saw with solar PV when the FiT was introduced."

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# Days of future past


Following the well-publicised changes to the Feed-in Tariff, 2013 had been billed as a year of consolidation. With events proving more turbulent than expected, **Paul Stephen** looks back at how the industry has fared over the past year

The big story of the New Year was the 'launch proper' of **Green Deal**. Although officially the scheme had come into existence the previous October, finance was not made available until January 28 alongside a £125m government cashback scheme designed to boost early uptake. Toriga and Travis Perkins were quickest off the mark as the first registered providers to sign a Green Deal plan with a homeowner one week later. 'Green Deal with it' became the official slogan of the government's official marketing campaign although, at £2m, questions were asked if enough resource had been committed to publicise the scheme in its first days.

January also witnessed climate change minister Greg Barker officially launch BRE's **National Solar Center** in Cornwall which aimed to be at the forefront of research and innovation in the sector. At the launch event, BRE director Nick Tune said: "The centre will help the sector deliver further reductions so PV can become competitive with other low-carbon electricity sources."

In February, it was the heating sector's turn to experience some policy changes with a **degression mechanism** introduced to both domestic and non domestic strands of the RHI to bring it into line with the Feed-in Tariff and control budgets. Globally, the level of installed PV capacity passed the **100GW** mark.

In March came the unwelcome, although not wholly unexpected, announcement that the **domestic RHI** would not be launching in 2013 but rather 12 months later in spring 2014. The **RHPP** scheme was extended as a stop gap and would later be doubled to sustain demand for renewable heating technologies. Industry reaction was mixed with some installers crediting the government with taking extra time to ensure the scheme was watertight before launch, whilst the majority criticised further delays to a scheme first drawn up in 2010. Tim Pollard, Plumb Center's head of sustainability, summed up the sector's disappointment by saying: "We do not believe that DECC understand the serious nature of delaying the RHI. SMEs investing in training and people will be hard hit."

March also saw the first rumblings of a **trade dispute** between the EU and Chinese PV manufacturers over pricing which would come to dominate the sector over the coming months. The European Commission opted to register all PV products imported from China ahead of the conclusion of its investigation into anticompetitive practices from Chinese firms allegedly 'dumping' panels in Europe at below cost price.

The world's largest offshore wind farm came online during April as the **London Array** saw all its 175 turbines switched on with a total capacity of 630MW. The **National Trust** also unveiled its ambitious target to produce half its power from renewable sources by 2020.

On May 09, the **EU/China PV dispute** came to a head as the European Commission made its decision to impose import duties of 47 percent on Chinese-made modules, wafers and cells. Despite objections from several EU members including the UK, an August date was set to introduce the tariffs. UK installers reacted fiercely to the news amid fears that the global wholesale prices would be driven up and kill off PV demand within these shores. STA ceo, Paul Barwell, said: "These duties, if imposed, will damage the UK solar market, particularly the large scale ground-mount sector. The cost increases resulting from these duties will throw the UK off course from its solar roadmap."

As summer arrived, attention turned back to Green Deal as the first **quarterly figures** were announced by DECC. Despite a large number of assessments being made (40,000), only four Green Deal plans had actually been signed and completed. DECC blamed the disappointing figures on software glitches whilst critics said the scheme was ineffectual and lacked appeal with the general public. 63 Green Deal providers and 1,254 installer organisations had become accredited under the scheme. Greg Barker said: "It will take time as this brand new market finds its legs, but I now expect the number of plans signed to start steadily rising."

During June and July, consultations were launched for the domestic and non domestic RHI. DECC proposed **increased tariffs** for several technologies under the commercial strand to increase take up and correct an apparent distortion towards biomass. A


month later, the industry was given its first glimpse of final tariffs for the **domestic RHI** as the government confirmed what financial support would be made available. A launch date was also set for this spring. A sceptical industry was generally enthusiastic about the document as tariff levels had been set at the upper end of those proposed during consultation.

"After numerous delays and uncertainty surrounding the scheme, DECC's announcement has been a welcome injection of confidence, providing clarity that secure, long-term tariff support will be made available to the domestic renewable heating technology mix," said Phil Hurley, managing director at NIBE.

Heat pumps were in the news during August following the publication of The Energy Saving Trust's **heat pump trials** phase two, which showed significant technological performance improvements since the original study in 2010.

The unappetising proposition of anti dumping tariffs on Chinese PV products looked to have been averted in August after the European Commission endorsed a **minimum pricing** offer from Chinese manufacturers. In a statement, EU trade commissioner, Karel De Gucht, said: "After weeks of intensive talks, I can announce today that I am satisfied with the offer of a price undertaking submitted by China's solar panel exporters. This is the amicable solution that both the EU and China were looking for."

REI passed a significant milestone a month later by celebrating its **fifth birthday**.

Another achievement was reached during September when statistics published by DECC showed that the amount of electricity generated from renewable energy sources had reached a new **record high** of 15.5 percent of total electricity generation in the second quarter of this year.

There was no let up in October with the launch of a £500,000 renewable heat incentive training support scheme **(RHITSS)** to help assist installers with the cost of upskilling. Greg Barker also handed a boost to the PV sector by unveiling the government's first ever **solar strategy roadmap** at the Solar Energy UK exhibition. The document reinforced the four key challenges which the final strategy will address in order to increase PV proliferation across the UK – cost reduction, carbon effectiveness, sustainability and scaleability.

We end of the year with renewable energy very much at the top of the news agenda. Energy bills became the focus of the final months of 2013 following Labour leader Ed Miliband's pledge to **freeze energy bills** should his party win the 2015 general election, followed by the majority of the 'big six' energy suppliers increasing tariffs by 8-10 percent. Prime minister David Cameron then entered the fray by promising to 'review green taxes' in an effort to alleviate the burden of rising fuel bills on hard-pressed consumers. To this problem at least, the industry can look forward to 2014 and beyond by offering an ace card to homeowners seeking a permanent way of lowering energy bills.

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# Reaching new heights

Energy secretary **Ed Davey** has officially switched on a cutting edge heat pump system powering an eco-friendly housing development in London from the River Thames

The £70m mixed used development includes 56 affordable homes called Kingston Heights, 81 luxury apartments and a 142 bedroom hotel on the site of a former power station in Kingston upon Thames.

Just 200 metres from the river bank, its 2.3MW community heating system draws up to 13 million litres of water each day through high efficiency heat exchangers. The low grade heat is carried to a plant room in the building via a closed loop where 41 Mitsubishi Ecodan heat pumps deliver it as usable heat to meet all heating and hot water demands in the complex.

Once the heat has been harvested, water is fed back into the river untreated, thus protecting aquatic ecosystems.

Project developers NHP Leisure Developments believe the system will save approximately 500 tonnes of carbon emissions per year and reduce heating bills by 18 percent compared to installing gas boilers in each apartment.

"At two metres below the surface the water never falls below 7°C, even in winter, so we can be certain that it can provide enough energy to heat the apartments," said Mike Spenser-Morris, managing director of NHP Leisure Developments.

"If we had fitted gas boilers, then the site would be dumping around 500 additional tonnes of carbon into the atmosphere each year. In addition, because of this system's exceptional energy efficiency, the equivalent heating cost for a couple living in a one bedroom apartment would be 18 percent more. For an average home, this would mean hundreds of pounds extra."

Energy secretary and MP for Kingston & Surbiton Ed Davey paid a visit to the site to switch on the heat pump system in October. He believes the scheme will pave the way for other innovative heat pump systems which tap into the heating potential of open water sources.

**Forward thinking: Energy secretary Ed Davey inspects the plant room of Kingston's new 2.3MW community water source heat pump system**

"I am interested in lowering people's gas and electricity bills and carbon emissions. This is how Kingston Heights fits into the bigger picture," he said.

"Kingston Heights is so important because the lessons that have been learned here are applicable elsewhere and are lessons the government needs to learn.

"I am also excited by what the team has achieved here because it has put Kingston on the map for a leading technology. Water source heat pumps need to be in the centre of our thinking. Many of our towns are built next to rivers and the potential for this technology to tackle climate change is huge."

**Liquid gold: Up to 13 million litres of water are drawn from the River Thames each day through high efficiency heat exchangers**

## At a glance

2.3MW total output
13 million litres of water per day from River Thames
500 tonnes annual carbon saving
7°C minimum temperature of river
41 Mitsubishi Ecodan heat pumps
18 percent reduction to heating bills

# Corporate concern

Julius Brinkworth, energy & technical director at **Power Efficiency**, explains why corporate Britain is increasingly investing in renewable energy generation as the prospect of powercuts loom

British companies are looking to install onsite renewable energy generation as fears about security of supply increase. Currently, nearly nine out of every ten UK businesses are worried about the security of their energy supply. Of these companies, 50 percent say they are investing in renewable energy sources and 43 percent say they are installing onsite power generation such as biomass or CHP as a result of these concerns.

These are some of the key findings of a report we recently published jointly with industry body, the Major Energy Users' Council (MEUC), entitled 'Powercut Britain – Are the lights going out for UK business?' – It contains the results of a survey we carried out over the summer of 2013 canvassing the opinions and concerns of major commercial and public sector energy users in the UK today. The combined energy spend of the 129 companies which participated in the survey, which included 10 percent of the FTSE 100, is approximately £1 billion per annum.

**Our clients in both the private and public sector are looking at every opportunity to install onsite renewable generation**

It is easy to understand why UK corporates so are worried that the lights could go out for UK plc in the near future. OFGEM has warned that the UK generating capacity is nearly at full stretch. With the planned closure of some coal and nuclear power stations, it says that spare capacity could fall from today's 14 percent level to just 4 percent in three years, with a risk of 'brownouts' and 'blackouts' starting in the winter of 2015-16. More recently, a report commissioned for the prime minister, David Cameron, from the Royal Academy of Engineering concluded that 'there is a growing risk of power shortages over the next few years'. It also points out that the closure of older power plants and the slow progress in building new ones was likely to stretch the system 'close to its limits'. Like OFGEM, it concludes that supply is particularly expected to come under strain in the winter of 2014-15.

**We believe the issue of energy management is moving out of the plant room and into the boardroom**


**Big business: Power Efficiency's recent report, published jointly with The Major Energy Users' Council, has found over 50 percent of UK companies to be investing in renewable energy**

Certainly, our experience of energy management is that our clients in both the private and public sector are looking at every opportunity to install onsite renewable generation, not just a green credentials exercise, but also because they are increasingly motivated by the desire to reduce energy costs and decrease their reliance on the National Grid.

In conclusion, I believe this report highlights the complex issues facing business in the UK today and underlines why we believe the issue of energy management is moving out of the plant room and into the boardroom. It provides a compelling insight into why managing energy costs and securing security of supply will dominate the agenda of UK businesses wishing to remain competitive in the coming decade. It also looks like good news for the future of the renewable energy installation market.

Copies of the report 'Powercut Britain, can be downloaded from **www.powerefficiency.co.uk**

# Breathing new life

Work on the largest PV park on a brownfield site in Wales is close to completion, according to regeneration company St. Modwen

The £15m solar energy project based at the 1,050 acre Baglan Bay site in Port Talbot will house 20,000 panels, enough to provide electricity for an estimated 1,200 homes per year in Wales.

The PV park is part of St. Modwen's £3 billion regeneration strategy across South Wales comprising a portfolio of 3,500 acres that includes the development of three former BP sites located in Neath, Port Talbot and Swansea.

Rupert Joseland, St. Modwen's South Wales and South West regional director, said: "Baglan Bay is a major regeneration project to transform over four million sq ft of disused brownfield land into a new employment site with the potential to create thousands of jobs locally and this PV park marks another important step forward in our redevelopment plans for the site.

**Urban decay: The 20,000 panel PV park at Baglan Bay, Port Talbot, is part of a larger £3bn regeneration project on derelict land in South Wales**

"Baglan Bay provides all the right conditions for PV, from good exposure to sunlight, ideal coastal climate for cooling panels and it's located in an area that does not impact the public.

"By early next year we will be in a position to connect these solar cell panels to the national grid and start producing renewable energy clean of emissions for residential and commercial developments across South Wales for years to come."

# Biomass on vacation

Simon Holden, co-founder of **Euroheat**, explains a project to bring the carbon and financial savings of biomass to Eildon Cottages, Melrose, Scottish Borders

The award-winning Eildon Holiday Cottages is a converted 18th century farm house, with six newly built self-catering cottages. Prior to biomass, the farm and holiday cottages were heated by two kerosene boilers.

**The system**

The new heating system consists of a single 65kW HDG Compact pellet boiler and accumulator. The HDG Compact is designed to burn pellets or wood chips, with optimised combustion technology, which results in high efficiency and low fuel consumption. An advanced thermostat controls the boiler temperature, ensuring only the required amount of heat is produced.

**Healthy return: Eildon Cottages' new biomass system delivers combined fuel savings and an RHI income of £11,067**

Pellets are transported to the combustion chamber and automatically ignited, with self-activated cleaning and a large ash container, meaning minimal input from end users.

**Why pellets?**

Pellets were chosen due to the limited space available to install the hopper and restricted access for delivery. Pellets are more expensive compared with logs or chip but offer additional benefits to end-users; such as taking up less space, a key requirement at Eildon, and creating less waste. Helping to ensure their low carbon credentials, pellets are now easily available from British-based manufacturers throughout the country.

The boiler and hopper are built into an existing outhouse. Internal pipework transfers the heated water to all six holiday cottages and an underground REHAU Rauthermex pre-insulated pipe then transfers heat to a heat exchanger in the main farm house. This separates the farm house from the holiday cottages hydraulically, so, if maintenance work on the distribution system is required on one building, it does not affect the heating in the others. Each individual property has its own standard central heating controls.

**Healthy returns**

Apart from the carbon saving benefits of switching to biomass, what's really attractive is its money saving credentials. At Eildon, twenty tonnes of pellets a year are required to fuel the system, at a cost of £3,600; less than half the cost of Kerosene. The savings don't end there; thanks to the Renewable Heat Incentive, Eildon receives an annual payment of £7,367, more than covering the pellets.

# Community spirit

A community-owned PV power plant has started feeding electricity to the grid in Wedmore, Somerset

The 1MW power plant, off Quab Lane on the outskirts of the village, will generate the same amount of electricity as 300 typical domestic solar arrays. Every year it will save around 450 tonnes of carbon dioxide that would otherwise be produced by burning fossil fuels. The £1.1m development has been funded by local investors.

More than 125 people have bought shares in the project and two-thirds are from the local area. The total invested so far is £654,000, with just over £300,000 worth of shares still available and bonds also on offer.

Incentives for investors include a projected interest rate starting at 5 percent and averaging 9.5 percent over the 27-year life of the project and 30 percent tax relief under the government's Enterprise Investment Scheme

Vanessa Becker Hughes from Wedmore Community Power Co-operative said: "We have now installed the last of almost 4,000 solar photovoltaic panels and are working hard to complete cabling for the second paddock. Later this autumn, hedges of native species will be planted to provide additional screening around the paddocks."

**Power surge: Almost 4000 PV panels have been installed at Wedmore's new community-owned solar power plant, which is now feeding electricity into the grid**

# Open for business

**Emerald Biogas** has announced the completion of its new anaerobic digestion (AD) plant in County Durham

The £8m facility, based at Newton Aycliffe Industrial Estate, is the North East's first commercial food waste facility and will generate enough renewable energy to power 2,000 homes each year.

The successful installation of the combined heat and power (CHP) system and other plant equipment by Entec Biogas GmBH has enabled the testing phase to be completed on time and the plant is now processing food waste and creating energy.

The AD facility can process card and plastics whilst a heavy duty depackaging process can handle the more difficult waste streams such as supermarket waste, which is often triple packed and manufacturing waste streams. The residual materials are then sent to local recycling facilities, further diverting waste from landfill.

In addition to power generation, a digestate will be spread onto local farmland, which will increase organic matter as well as improving soil condition and structure.

**Cooking on gas: Emerald Biogas' new £8m anaerobic digestion facility in County Durham will supply clean electricity to 2000 homes and fertilizer from local food waste**

Antony Warren, director of Emerald Biogas, said: "I am delighted with the progress made in terms of getting the plant to this stage. We are now in the position to accept and process unwanted commercial food waste and employ the latest AD technology to create a valued commodity that will be extremely beneficial to the local business and farming community.

"We are all excited for the positive journey ahead, with expansion a strong possibility. We would like to see Emerald Biogas reach its full potential in the near future."

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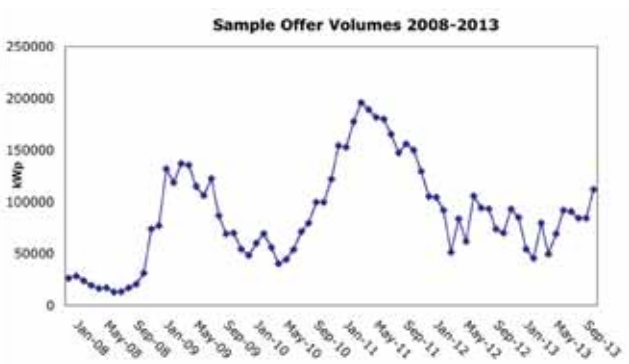
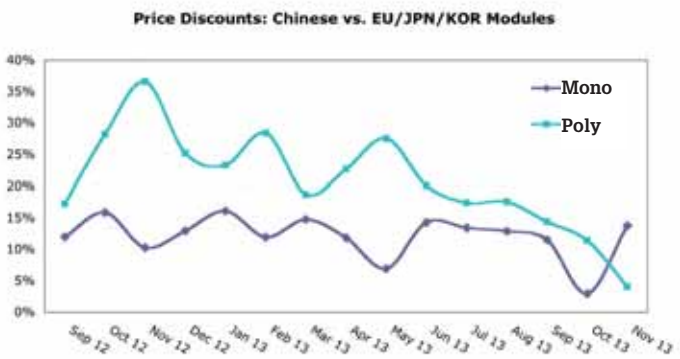
# European PV pricing data (compiled by Iain Garner Associates)

With a 30 percent increase in PV module offer volumes this month, our sample shows larger quantities coming into the market. The top 20 includes many new or unfamiliar suppliers such as Apollo (Japan), Solarpeace (China) and S-Energy (South Korea), showing that although the European market may be less dominant it is still attractive for many manufacturers. However, prices for non-Chinese brands have increased, possibly as an over-reaction to EU import tariffs. As our graphs show, the price gap has widened this month especially for mono-Si modules. Clearance sales are also having an effect particularly for thin film PV modules, with Solibro (now owned by Hanergy) CIGS products available in huge quantities at some of the lowest prices seen (Euros 0.26-0.33/W). We are also beginning to see large volumes of Bosch Solar products feeding through as the company has almost completed negotiations to sell its solar manufacturing assets in France and Germany.




## Top 20 European PV module offers by volume (kWp)

| Manufacturer | Country of Origin | Total Offers kWp | Max Price GBP/Wp | Min Price GBP/Wp | Average Price GBP/Wp |
|---|---|---|---|---|---|
| Yingli Solar | China | 13617.6 | 0.58 | 0.35 | 0.51 |
| Apollo New Energy | Japan | 10000.0 | 0.39 | 0.39 | 0.39 |
| Solarpeace | China | 7149.1 | 0.43 | 0.42 | 0.42 |
| S-Energy | South Korea | 6222.5 | 0.51 | 0.43 | 0.48 |
| Amerisolar | China | 5652.4 | 0.28 | 0.22 | 0.26 |
| Solibro GmbH | Germany | 3099.0 | 0.46 | 0.45 | 0.45 |
| Trina Solar | China | 5293.1 | 0.58 | 0.44 | 0.51 |
| Bisol | Slovenia | 5000.0 | 0.46 | 0.46 | 0.46 |
| Sharp | Japan/UK | 3199.1 | 0.59 | 0.28 | 0.50 |
| Noble Solar Industries (NSI) | Taiwan | 3000.0 | 0.39 | 0.39 | 0.39 |
| Eco Future | Malaysia | 3000.0 | 0.41 | 0.41 | 0.41 |
| Realforce Power Company Ltd | China | 2993.5 | 0.46 | 0.42 | 0.44 |
| SolarWorld | Germany | 2672.0 | 0.64 | 0.44 | 0.57 |
| Years Solar Co Ltd | China | 2540.0 | 0.45 | 0.44 | 0.44 |
| Sonali Solar | India | 2475.0 | 0.45 | 0.45 | 0.45 |
| Bosch Solar | Germany | 2448.9 | 0.66 | 0.48 | 0.56 |
| Hymon Energy | Poland | 2000.0 | 0.45 | 0.45 | 0.45 |
| Q-Cells | Germany | 1549.1 | 0.60 | 0.49 | 0.54 |
| Ennova Energia | Spain | 1500.0 | 0.50 | 0.50 | 0.50 |
| REC | Singapore | 1495.0 | 0.51 | 0.38 | 0.44 |

**Report Date 15-Nov-2013** **Exchange Rate Euros to GBP = 1.19 (www.xe.com)** **Total sample size - 111758 kWp**
**All figures apply to the 30 day period prior to the report date**

# Figure it out

## Generation tariffs for non PV technologies

| Technology | Band (kW) | Tariffs (p/kWh) |
|---|---|---|
| Hydro | ≤15 | 21.65 |
| | >15-≤100 | 20.21 |
| | >100-≤500 | 15.98 |
| | >500-≤2000 | 12.48 |
| | >2000-≤5000 | 3.23 |
| Wind | ≤1.5 | 21.65 |
| | >1.5-≤15 | 21.65 |
| | >15-≤100 | 21.65 |
| | >100-≤500 | 18.04 |
| | >500-≤1500 | 9.79 |
| | >1500-≤5000 | 4.15 |

(Source: OFGEM)

## Number of MCS registered installers per technology

| Technology type | Cumulative number | Registered October 13 |
|---|---|---|
| Solar PV | 3074 | 31 |
| Biomass | 436 | 07 |
| Air source heat pump | 1082 | 13 |
| Ground source heat pump | 893 | 10 |
| Solar thermal | 1274 | 10 |
| Small Wind | 130 | 01 |
| Total | 3883 | 72 |

## Number of MCS registered installations per technology

| Technology type | Cumulative number | Installed Oct 13 |
|---|---|---|
| Solar PV | 475190 | 8876 |
| Biomass | 3645 | 182 |
| Air source heat pump | 23047 | 1264 |
| Ground source heat pump | 7176 | 138 |
| Solar thermal | 5776 | 93 |
| Small Wind | 4142 | 33 |
| Total | 518976 | 10586 |

**(Figures supplied by Gemserv)**

## Generation tariffs for Solar PV

| Tariff band | FiT rate (p/kWh) valid until 31-12-13 | FiT rate (p/kWh) valid from 01-01-14 |
|---|---|---|
| <4kW | 14.90 | 14.90 |
| >4-10kW | 13.50 | 13.50 |
| >10-50kW | 12.57 | 12.57 |
| >50-100kW | 11.1 | 10.71 |
| >100-150kW | 11.1 | 10.71 |
| >150-250kW | 10.62 | 10.25 |
| >250kW-5MW | 6.85 | 6.61 |
| Standalone | 6.85 | 6.61 |
| Export Tariff | 4.64 | 4.64 |

## Domestic RHI tariffs

| Technology | Tariff rate (p/kWh) |
|---|---|
| ASHP | 7.3 |
| Biomass boilers | 12.2 |
| GSHP | 18.8 |
| Solar thermal | 19.2 |

Domestic RHI is expected to be introduced in spring 2014 and will apply to all eligible installations installed since July 2009

## Number of Green Deal assessments

| Month | Assessments |
|---|---|
| January | 74 |
| February | 1729 |
| March | 7491 |
| April | 9522 |
| May | 12146 |
| June | 13517 |
| July | 13645 |
| August | 13086 |
| September | 13,967 |
| October | 16,674 |
| Total | 101,851 |

(Source: DECC)

# Cost comparison of heating fuels

| 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 | 0.58 per litre | 2530 litres | £1,467 |
| Wood pellets | 4800 per tonne | 94 | 24300 | 235 per tonne | 5 tonnes | £1,175 |
| Natural gas | 1 per kWh | 90 | 25300 | 0.046 per kWh | 25300 kWh | £1,163 |
| LPG | 6.6 per litre | 90 | 25300 | 0.48 per litre | 3833 litres | £1,840 |
| 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 | 0.58 per litre | 759 litres | £440 |
| *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 | 0.046 per kWh | 7590 kWh | £349 |
| *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 | Reviewed tariff (proposed for 2014/15) |
|---|---|---|---|---|---|
| Small biomass | Solid biomass: Municipal solid waste (inc CHP) | Less than 200 kWth | Tier 1: 8.6<br>Tier 2: 2.2 | 20 | No change |
| Medium biomass | Solid biomass: Municipal solid waste (inc CHP) | 200 kWth and above, less than 100 kWth | Tier 1: 5.0<br>Tier 2: 2.1 | 20 | No change |
| Large biomass | Solid biomass: Municipal solid waste (inc CHP) | 1000 kWth and above | 1 | 20 | 2.0 |
| Small ground source | Ground source heat pumps, water-source heat pumps, deep geothermal | Less than 100 kWth | 4.8 | 20 | 7.2-8.2 |
| Large ground source | Ground source heat pumps, water-source heat pumps, deep geothermal | 100 kWth and above | 3.5 | 20 | 7.2-8.2 |
| Solar thermal | Solar thermal | Less than 200 kWth | 9.2 | 20 | 10-11.3 |
| Biomethane | Biomethane injection and biogas combustion, except from landfill | Biomethane all scales, biogas combustion less than 200 kWth | 7.3 | 20 | No change |

(Source: OFGEM)

# RHPP Phase 2

| Technology | Voucher value (£) |
|---|---|
| Solar thermal | £600 |
| Off gas only | |
| Biomass | £2000 |
| ASHP | £1300 |
| GSHP | £2300 |
| All vouchers must be redeemed before March 31 2014 | |

Applicants must also undergo a Green Deal assessment in order to qualify

**What data would you like to see on this page?**

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# Knowledge: Case studies

## HEAT PUMPS

**What:** Scottish marina building uses renewable energy from the sea bed

**How:** 8kW NIBE F1145 GSHP

**Result:** COP of up to 5.03 and all hot water/space heating needs met

Newly-build shore facilities at Inverness Marina now provide visiting yacht crews with shower and laundry facilities powered by energy from the sea.

With such high heat requirements, Inverness Marina had approached local installers Black Isle Renewables looking for a cost-effective alternative to oil or LPG heating.

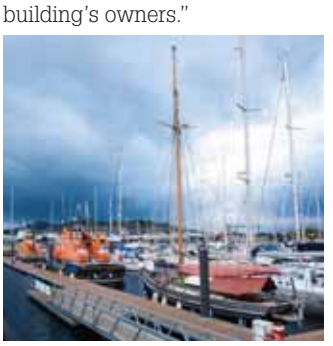
The Black Isle team specified and fitted a NIBE F1145 ground source heat pump – using a 400m closed-loop pipe collector system to harness heat from the marina and provide space heating and hot water for the building.

Using the sea as a constant heat source meant that there was no need for the Black Isle installers to drill any boreholes or trenches into the ground surrounding the shore building. Instead, the system operates using submerged collector pipes that draw energy directly from the marina basin back to the heat pump, which then heats water in a 750-litre thermal storage tank.

Iain Thomas, managing director at Black Isle Renewables, said: "Research shows that the water temperature at sea bed level in the marina is a relatively constant 10°C all year round. Therefore, it made perfect sense to make the most of the natural surrounding resource and use this renewable energy to meet the facilities' high heat demand.

"The constant sea temperature means that the 8kW system can work at maximum efficiency, harnessing enough energy to provide underfloor heating for the well-insulated building and hot water for the washrooms and laundry facilities."

Phil Hurley, managing director at NIBE, added: "The new shore facilities at Inverness Marina perfectly showcase the extensive benefits ground source heat pumps have to offer buildings with a high heat demand. As well as making the most of the marina's consistent temperature to provide a reliable heating and hot water solution for visitors, the F1145 system also offers substantial financial benefits for the building's owners."



**Making waves: Visiting boaters benefit from a consistent hot water supply at Inverness Marina from energy drawn from sea bed**

## WIND

**What:** UK's first Endurance X29 wind turbine installed on Cornish farm

**How:** 225kW unit installed by Earthmill

**Result:** 500,000 kWh estimated annual electricity generation

The UK's first Endurance X29 wind turbine has been installed on a farm at Liskeard in Cornwall where it will generate the equivalent electricity used by almost 150 homes.

The installation was carried out by Earthmill, one of the few authorised suppliers than can install the Endurance X29.

**Generation game: The Endurance X29 turbine on Matthew Rowe's dairy farm at Liskeard in Cornwall is predicted to supply 500,000 kWh a year**

The 225kW unit, which was built by Endurance Wind Power at its new factory in Hartlebury, West Midlands, is already producing clean energy and Feed-in Tariff revenue on Matthew Rowe's Great Tredinnick Dairy Farm where it is predicted to generate up to 500,000 kWh per year.

"The X29 is modest in size, requiring only a 30m mast which makes it a great option for farms with high power requirements," said Steve Milner, managing director of Earthmill.

"It has a very efficient generator which operates at a low level resistance, allowing the turbine to start producing energy at a wind speed of just four metres per second, just a light breeze."

He added: "The financial benefits of wind turbines for farms are becoming widely known, with farmers turning to them as an additional source of revenue in the wake of a dramatic fall in income, coupled with rising energy costs."

Endurance says its investment in new manufacturing facilities is evidence of the boom in the farm wind market. The Hartlebury plant should create up to 100 new green jobs and is designed to build 100 turbines a year.

## THERMAL STORAGE

**What:** French holiday home combines solar thermal heating with wood burning stove

**How:** 275 litre Xcel HEATBANK

**Result:** Property is approaching self sufficiency in heating needs

Property developers David and Pam Marchant were keen to utilise renewable heating when extending their property portfolio from Sussex to rural France.

The couple duly bought a new retreat named Le Moulin de la Fonderie– a large two bedroomed stone cottage located in Mayenne, where the Loire Valley meets Normandy.

Accommodating up to eight people, heating was a major consideration but, initially, the main heat source was via expensive electricity panel convectors.

After investigating all of their options, the Marchants developed a plan to somehow combine central heating and hot water from wood stoves and solar panels whilst allowing for the fact that the latter would not be sufficient on its own. To accomodate this they invested in a multifuel Xcel HEATBANK thermal heating system from Thermal Integration Limited, distributed by Specflue.

"We visited as many Eco and domestic shows as possible and checked boiler and stove manufacturers," said David Marchant.

"Along the way we heard of the HEATBANK and loved the theory. It was soon apparent that the thermal store would override all other options. In a nutshell it provides both total space heating and high pressure, high flow hot water by storing and managing heat until required from a variety of renewable heat sources simultaneously.

"We greatly enjoy the zero cost of the wood at hand now we have this clever system up and running providing constant working hot water and central heating whilst adapting to the wood heat. It is simple to operate with reduced reliance on a boiler and annual filters also play their part. We have already noticed significantly reduced energy costs and we are heading towards self sufficency."

**Country life: David and Pam Marchant turned to the Xcel HEATBANK thermal storage unit to facilitate hot water and space heating throughout their rural property via wood burning stoves**

## SOLAR PV

**What:** Shading issues overcome for domestic split roof PV array

**How:** Enphase M215 microinverters

**Result:** 4kW system achieving maximum power output

Allan Davis, an electrical engineer living in Leeds, recognised that installing solar panels on his house would be an excellent way to take control of his energy bills, whilst doing his bit for the planet. Although keen to install a 4kW system, his house and garage had the problem of limited roof space, compounded by shading issues.

Having assessed Mr Davis' house and garage, local installers The Phoenix Works concluded that each separate building would accommodate eight modules. It was decided that an Enphase microinverter system presented the best solution, negating difficult, and potentially dangerous, long Direct Current (DC) cable runs and reducing the shading affect from the chimney. The alternative was to install two distinct string inverters since it would not be practical (or particularly safe) to run DC from the garage back to the house.

The Phoenix Works installed two distinct systems on each roof, both cabled back to a single generation meter at the supply origin. Given his profession, Mr Davis was also able to install ducting from the garage to the house, thereby reducing the cost of installation.

Mr Davis says he has achieved his objectives and now enjoys impressive rates of power production despite the challenging circumstances. He has provided The Pheonix Works with a glowing report and has recommended both the installer and Enphase to colleagues and friends.

**Problem solving: Electrical engineer Allan Davis turned to Enphase microinverters to overcome shading issues for his 4kW split roof PV array**

# My working week

**Who:** Guy Ransom, commercial director at Finn Geotherm UK

**What:** Finn Geotherm is based in East Anglia but has heat pump installation teams covering all of England and Wales. The company is a Dimplex Renewables Accredited Installer.

**Growing up: Guy Ransom, commercial director at Finn Geotherm, says all of the building blocks are now in place for the continued expansion of the company**

## A safe pair of hands

**Monday**

First thing on the agenda is an internal team meeting to review progress on current projects and cash flow position. Thankfully we have an excellent team so there are no major issues to address.

I get in touch with the primary contractor on a Ministry of Defence project tender involving 36 MoD buildings which would be ideally served by 18 new Dimplex A Class 12kW air source heat pumps. There is no question that Finn Geotherm would be well placed to provide the solution and A Class is the ideal equipment but separation via the tender process makes getting this message across challenging, which is very frustrating.

I finish the day by reviewing my to-do list for the remainder of the week.

**Tuesday**

Among today's tasks is to arrange the annual MCS surveillance review with BRE, which seems to come around more quickly each year!

I'm also asked to submit a quotation for a commercial building developer looking to expand its existing rural office development in Norfolk. Finn Geotherm provided the ground source heat pump system for its existing offices alongside another provider, but it's promising to learn that the business is only approaching Finn Geotherm for new development. We're acknowledged as being a 'safe pair of hands' and it's an exciting project – six times bigger than the original installation.

**Wednesday**

I review the project status on a 120kW ground source heat pump for a country estate in North Norfolk and the client agrees that everything has run according to plan which is pleasing to hear.

I finish off the day with some admin and review our current 'hot prospect' project list with our sales and quotations managers. We all agree that while many exciting projects are moving forward, there is still ample scope for accelerated development.

**Thursday**

The first call of the day is to West Suffolk College to discuss the syllabus for an apprentice joining us soon. The College has agreed to provide a 3 year modular heating, electrical and refrigeration Level 3 NVQ.

I also call a customer who has just had the first field trial unit of Dimplex's new A Class air source heat pump installed. They're very happy and are quick to report that the system is incredibly quiet and running costs are already less than expected. We are proud to be one of very few expert installers in the UK to field trial the new units.

**Friday**

I finish off the week with our monthly board meeting. It's great to see that all targets for the past four years have been achieved and we're now moving to a new stage of growth. Importantly, all of the key building blocks for Finn Geotherm's continued success are now in place; industry leading ground and air source systems, an established reputation, government incentives finally in place and greater public awareness of renewables in the face of increasing fossil fuel costs.

After a busy but productive week, I leave the office at 5pm (an early night for once) to attend a Meat Loaf concert at Newmarket Race Course – I'm still an old rocker at heart!

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