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2013 – the big green onesie?

We all know that 13 is supposed to be an unlucky number and looking at the start of the year – disruptive snowfall, the loss of several high street stores and the mental images / anguish caused by the news that Nick Clegg is the owner of a green onesie – haven't made this the best start to the year.

But these are the stories that make the news and there are plenty of our own, that will make much better reading. 2013 is hopefully on course to be one of the renewable sector's better years. With the consultation now closed on the Renewable Heat Incentive (RHI), there is much to look forward to this year. Hybrid systems, with metering, are now to be included and speaking to those that attended the RHI workshops across the UK, a positive mood has definitely prevailed.

Of course, plans for the Green Deal are still on track and hopefully, by the time this issue reaches you, we will have some firmer details on the scheme that should help boost the industry and bring energy efficiency benefits to the masses.

There are positives to be taken from recent events. As householders shiver and quiver at the thought of rising energy bills as they have to crank up heating systems during this cold snap, we have the ideal opportunity to push the power of renewables. Let this be their last year of high energy prices and sell them a viable and economic renewable alternative. Whilst it is sad to see the demise of business, the loss of jobs and yet another store boarded up, we need to take lessons from the high street closures. The way we do business has changed. We all need to be ready to adapt. The internet, for example, plays a huge role in how business is won and lost and it is up to us all, however small our business, to make the best use of online marketing tools and media for example, to boost revenue and our customer base.

As for the positive in the idea that Nick Clegg is slouching around his home in an over-sized baby outfit? Answers on a post card please . . .

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"The recent REI conference provided a fresh slant on available information such as the interesting feedback provided on the market survey of end users carried out by Delta Energy & Environment, Garry Broadbent" p46

MCS explains thermodynamic decision

The MCS has defended its actions regarding thermodynamics panels. Installers of thermodynamic panels have accused the Microgeneration Certification Scheme (MCS) of acting 'illegally' in its decision to bar registrations of the products following a review in November.

It has been claimed that as the technology already attracts the Solar Keymark standard (EN12975) and is certified as a solar thermal collector, the MCS has no right to dispute this and strike it from the scheme.

In a letter sent to installers on 16 November, the MCS said Solar Keymark certification had been granted based on collectors tested with water as the heat transfer medium. Therefore models using refrigerant and operating on a vapour compression cycle, which are widely marketed in the UK, did not fall into this classification and would not be recognised by the MCS. It added that thermodynamic panels were more suited to classification as a heat pump technology and work would continue to accommodate them under the MIS 3005 standard.

The decision will have wide-ranging repercussions for the industry as although refrigerant models can still be installed in the UK, subject to UK and F-GAS regulations, without MCS registration they will not be eligible for the Renewable Heat Incentive.

Stuart Dixon, managing director of Thermal Reflections, has hit back at the MCS' definition by upholding its classification as a solar thermal product.

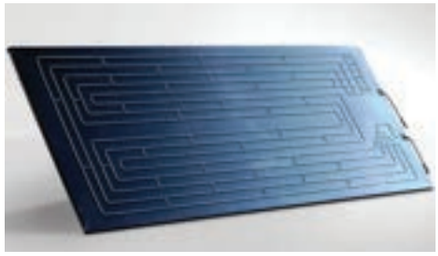
"In our view, the MCS has no authority to question the validity of the Solar Keymark standard. MCS is objecting because the panels are tested with water, whereas thermodynamic panels circulate refrigerant R134a or R407c. Well, in fact, water is a refrigerant and is used in many applications in the industry.

"They also object that the fluid undergoes a phase change from liquid to vapour. This is true, but in an evacuated tube system incorporating a heat pipe, phase changing also occurs."

Martin Mellish, general manager at I4Solar, agreed that the MCS was wrong to reject the technology's status as a solar thermal product and overrule a European standard which could result in legal action

He said: "We believe this is an illegal decision because the panel is EU certified and under European law, no nation state can ask for a higher standard. The premise is wrong to say that it isn't a solar thermal panel. The product has European thermal certification so there are grounds for a legal case.

"We have written to MCS asking for clarification and I imagine legal action will now be taken by one of the European manufacturers or a large importer."



Classified information: The debate continues over whether to classify Thermodynamic panels as solar thermal or heat pump technology. Image credit: Green Energy Solutions

In a statement provided exclusively to REI, the MCS defended its decision and said: "MCS would like to clarify that the decision taken by the Scheme did not bring into question the validity of Solar Keymark product certification processes.

"We have no evidence that the products concerned have been tested with the refrigerant which is being included in the systems being sold into the UK.

"The scheme has taken steps to meet with manufacturers of thermodynamic products, and is currently working with industry to establish a working group in order to provide scheme requirements."

Industry responds to Renewables Roadmap

The PV industry has welcomed the publication of the UK Renewables Roadmap in which the government sets out how the UK will fulfil its 2020 15 per cent renewable energy target.

For the first time, solar PV has been given full recognition as a 'key technology' in achieving the necessary levels of renewable electricity generation and will have its own dedicated strategy to increase capacity from later this year.

Simon Allan, renewables director at Plumb Center, said: "Plumb Center regards solar PV as a core long-term renewable technology, for which we distribute the leading brands. We look forward to solar PV continuing to play an important role in 2013."

Nick Keighley, director at Solarlec, added: "We are very pleased that PV has finally been recognised by DECC as a 'key technology' for the renewables roadmap. After a very challenging 2012 some stability is now returning to the PV industry, this decision can only reinforce that process and enable us to look to the future with renewed confidence."

The latest Renewable Energy Roadmap status report, published by DECC in December, also shows that renewable power output grew 27 percent from July 2011 – June 2012 while, overall, renewable energy accounted for 10 per cent of total electricity generated in the UK.

RenewableUK hits back at turbine claim

RenewableUK has reacted angrily to a new study which casts doubt over the effective lifespan of Britain's wind turbines.

The trade body for the wind and marine industries slammed the report and its claim that most wind turbines will only work for 12-15 years as 'absurd'.

Written by Prof Gordon Hughes, Edinburgh University, the study says that wear and tear will lead to a significant drop in electricity output over a decade before the 25 year manufacturer guarantee and Feed-inTariff payment period has elapsed.

Published by anti-wind think tank the Renewable Energy Foundation, it adds that the costs associated with replacing turbines and loss of output will have to be met by the taxpayer to the tune of almost £1bn.

RenewableUK's director of policy, Dr Gordon Edge, said: "Onshore wind farms have been generating increasing amounts of clean electricity for British homes for more than twenty years. For example, Delabole wind farm in Cornwall opened in 1991 and it's still going strong.

"If what is claimed were true, then the industry simply wouldn't be able to raise money – the fact that investors have remained confident in the wind energy sector demonstrates their confidence in the technology. Successful investors are no pushover- they always make sure they kick the tyres, take the test drive and do their homework before they commit their cash.

"All-importantly, wind farm developers only earn money for the clean electricity they actually generate – so it's very much in their interests to make sure that their turbines are maintained throughout the twenty-five year lifespan of the wind farm to an optimum level – which includes upgrading as the technology improves.

"The seventy-six thousand who will find jobs in wind energy by the end of the decade will look back at reports like this in sheer disbelief."

Easy PV

Solar PV wholesaler Midsummer Energy has developed an online tool to help installers easily design solar arrays and cut down on paperwork. Whatever your approach to designing a solar array – whether you are the kind of installer that sets out with a biro and the back of an envelope or whether you wrestle with different programs to do the layout, energy calculation, structural calculations, schematic, and inverter compatibility, Midsummer Energy says you'll welcome this website to produce PV designs quickly and professionally,.

Andy Rankin, managing director of Midsummer Energy, recently set up an online array designer that his wholesale and installation teams have been using to speed up quotes and simplify producing the paperwork required under the MCS.

Easy PV helps draw roof and panel layout to scale; specify mounting components; select inverters; produce SAP calculations; draw schematics; produce roof and wind loading calculations; list and order components required and save the design for MCS records.

News in brief

Dimplex is strengthening its commercial heating team with the addition of Andie Morris who has moved across to work with commercial customers to improve the energy efficiency of their heating systems, and identify where potential savings can be made.

Nu-Heat is expanding its sales force to further improve its customer service. More field sales managers (FSMs) will be based regionally to allow Nu-Heat to develop better face-to-face relationships with key installers. The company has also appointed a number of business development managers to its sales team who are responsible for driving sales growth.

South Wales-based solar PV manufacturer, GB-Sol, has expanded operations with a move to an 18,000 sq ft facility in Pontypridd, South Wales. The move has increased production five-fold.

Vaillant has appointed Mark Derbyshire as commercial director - UK and Ireland. Derbyshire has worked for the Vaillant Group for seven years and has held senior sales positions across all of the group's UK brands. For the past twelve months, he has been commercial director for the northern region.

The UK Green Investment Bank (GIB) has appointed Robert Mansley as managing director, Capital Markets.
Mansley was previously managing director at Morgan Stanley where he was head of European renewables in the Global Power & Utilities Group in Investment Banking based in London. Prior to this he worked at Credit Suisse.

Verity Naseby has joined wind turbine specialist, ICE Renewables, as operations and maintenance co-ordinator after holding roles in both retail and hospitality. She will be responsible for client communication, engineer co-ordination, turbine monitoring and will be involved with the Feed In Tariff accreditation process.

Green Electrician wins social housing solar project

Renewable specialist, the Green Electrician Group, has won a contract to supply three vertical solar PV facades for Irwell Valley Housing Association. Working for main contractor, ISG, the project includes the installation of three, 16-panel, vertical PV arrays on tower apartments, providing electricity for use in communal areas.

The PV arrays were installed on flat walls, 13 stories high, using mast climbers. The design had to be aesthetically pleasing, combining black GB Sol panels with bespoke black aluminium mounting frame.

"We were pleased with the overall design which looks clean, modern and added to the overall impact of the front of the buildings," said the Green Electrician group operations director, David Young. "In addition to providing a distinct, up to date look, most importantly they are generating free electricity for use in the building, and reducing carbon emissions."

"The Green Electrician Group had two weeks to complete the project, working alongside our own teams who were rendering the front of the buildings. This meant tight deadlines as we were both using the mast climber systems. They worked hard to finish each façade in the time given and the result is very impressive," commented site manager, Nick Galvin, ISG.

Industry welcomes carbon emissions regulations

Installers and manufacturers have welcomed new regulations which will require all companies on the London Stock Exchange to report carbon emissions.

From this April, 1,600 of the UK's largest firms must disclose direct and energy-related emissions. Several global corporations have already begun the process with Facebook just one case of introducing mandatory carbon reporting to the corporate world.

The US-based social media giant has released data for 2011 indicating its greenhouse gas emissions for the year stood at 285,000 metric tonnes – the equivalent of 269 grams per user.

Photon Energy director Jonathan Bates described it as a positive move but said more action is needed if businesses are to actually reduce carbon footprints.

"I think such scrutiny is a good thing but the figures by themselves are meaningless unless they are part of a plan to reduce your carbon footprint where you actually set a target and work out how to achieve it and when," he said.

Mark Elliott, director at Energeno, agreed that mandatory reporting was a good concept but that it should not be restricted to larger companies only.

"It may be painful at first but we firmly believe it is a process that all businesses should be encouraged to go through," he said.

"The requirement for large companies to record and report carbon footprints will hopefully mean that best practice for identification and reporting will be worked out before smaller companies, likes ours, are also required to do so.

"Assigning carbon for manufacturing processes and products is a very complex business, but larger companies leading the way will help smaller businesses meet the challenge of assessment in future."

New currency: From this April, all companies listed on the London Stock Exchange will legally have to report on carbon emissions

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Events

Solar Power UK 2013 Roadshows
7 February Sandown Park Racecourse, Surrey
8 February Hamilton Racecourse, Glasgow
14 February Aintree Racecourse, Liverpool
15 February Thirsk Racecourse, N. Yorks
20 February Liberty Stadium, Swansea
27 February Leicester Racecourse,
28 February Exeter Racecourse, Devon
www.solarpowerukevents.org/roadshows

Ecobuild 2013
5-7 March London Excel
www.ecobuild.co.uk

The Eco Technology Show 2013
14-15 June The Brighton Centre
www.ecotechnologyshow.co.uk

Intersolar Europe
19-21 June Munich, Germany
www.intersolar.de/en/intersolar.html

ISH 2013
12-16 March Frankfurt, Germany
http://ish.messefrankfurt.com/frankfurt/en/besucher/willkommen.html

The Energy Efficiency Exhibitions
South-West 10 September
Midlands 12 September
North-East 17 September
Scotland 19 September
South-East 24 September
North-West 26 September
www.energyefficiencyexhibitions.co.uk

The Renewables Event
10-11 September NEC, Birmingham
www.therenewablesevent.com/

The Energy Event
10-11 September NEC, Birmingham
www.theenergyevent.com/

Solar Power UK
8-10 October NEC, Birmingham
www.solarpowerukevents.org/

Energy Solutions
9-10 October London Olympia
www.energysolutionsexpo.co.uk

HSE warns of wood pellet danger

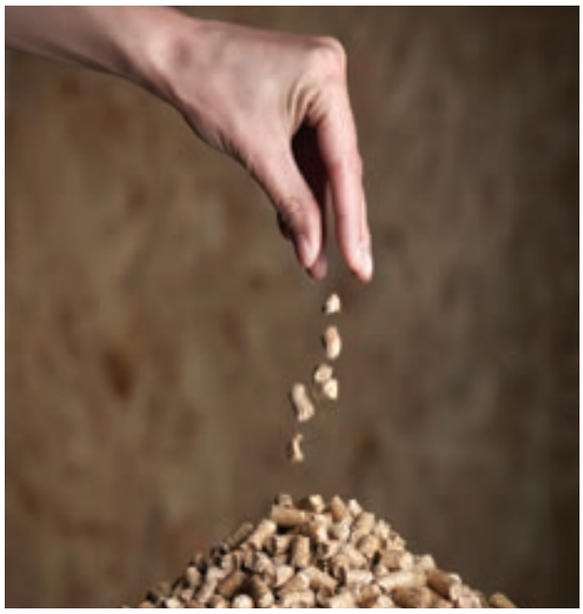
The biomass sector has reacted to recent warnings over the risks posed by carbon monoxide poisoning in wood pellet storage areas. In December the Gas Safety Trust and Health & Safety Executive (HSE) issued an alert and safety guidelines to installers and distributors of wood pellets in response to the nine fatalities which have occurred since 2002 due to poisoning in storage areas.

The HSE has published basic steps, including adequate ventilation and regular cleaning, which should be followed in order to avoid any risk-to-life presented by large quantities of carbon monoxide accumulating in enclosed storage spaces.

A statement from the Gas Safety Trust said that increased awareness was needed now due to the increasing popularity of biomass as an alternative fuel source to oil and LPG and the uptake of the technology which is expected after this summer's launch of the domestic Renewable Heat Incentive (RHI).

Paul Clark, managing director of Rural Energy, agreed that the issue should be treated seriously but that any risks could be easily negated by following simple safety measures.

"We would advise anyone who owns or operates wood pellet boilers to check with their suppliers that the hoppers comply with the HSE's new guidance," he said.



Safety first: The biomass sector has hit back at an HSE alert regarding the safety of wood pellets

"Generally, the main points to consider are adequate warnings to prevent unsafe entry into the store, correct cleaning and servicing of equipment, ensuring risk assessments and a safe system of work are in place and materials safety data sheets are available."

Windhager UK's managing director, Oliver Duckworth, went further by stating that biomass system operators should not be unduly worried as no deaths, to date, had occurred in the UK. He added that while the risks need to be recognised, the health dangers posed by handling wood pellets remained far less than using fossil fuels.

"While not trying to lessen the risks, it should also be recognised that of the nine deaths associated with entering wood pellet stores, only one of those has been associated with a domestic installation," said Duckworth.

"Four deaths were from entering ships holds, two deaths from entering large storage silos, one from entering an 83m³ hopper and one from entering a hopper containing 155 tonnes. None of the incidents used by HSE have been reported in the UK despite there being several thousand silos in existence."

He added: "As with all fuels, whether heating oil, natural gas or solid biomass, correct handling procedures should be followed. Wood pellets are a non-volatile fuel and any risks associated with handling or combustion are far less than those associated with volatile and flammable fossil fuels such as gas."

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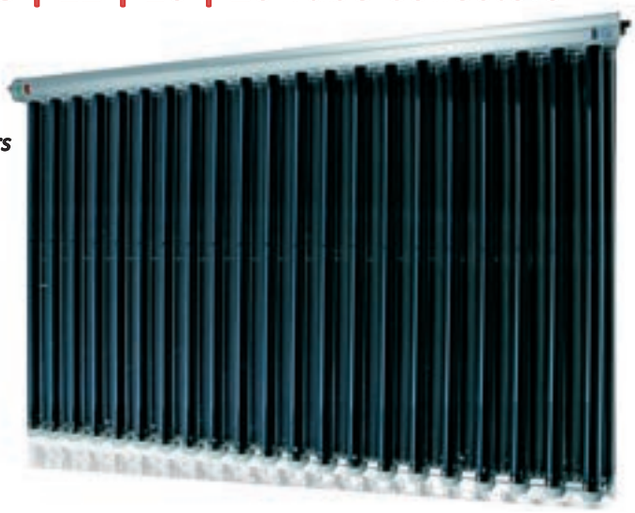

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Would you credit it?

Terry Wardle, energyassessormagazine.com discusses the news that applicants for Green Deal finance will undergo a credit check

In a move that could damage take-up of Green Deal, it has been announced that applicants for Green Deal finance will be credit checked. It had previously been assumed that this would not happen as the loan is on the property and not the individual. However, according to a report on the Inside Housing website, the Green Deal Finance Company (GDFC) has said it has been told by the Office of Fair Trading it will have to carry out the checks in order to comply with financial regulations.

A further report on the Business Green website quoted the Green Deal Finance Company as playing down the effect of the move, saying that poorer families not eligible for loans might still qualify for grant aid to improve the energy efficiency of their homes. This may be so but there might be many families not poor enough to qualify for grant aid or well-off enough to qualify for loans, and this could be a blow both to Green Deal take-up and the government's stated aim of reducing fuel poverty amongst poorer families.

Inside Housing said social landlords and Green Deal Providers are worried tenants with a poor credit history risk being stuck in cold, inefficient housing. Credit checks could also make homeowners more reluctant to take out loans, or take them over with a property.

It is being assumed, for example, that if a tenant or property owner moves, the new occupant will not be credit checked. So, if the new occupant finds some way to avoid making payments on the loan, this might mean that the original occupant, who was credit checked for the loan, would then find their credit rating was damaged as a result.

There might be many families not poor enough to qualify for grant aid or well-off enough to qualify for loans

This could also create problems for assessors, since customers ordering assessments will not be credit checked until later in the process and could be reluctant to pay for the assessment if they are denied a loan to do the work. This isn't likely to be a problem for big providers like British Gas, but could be a problem for independent assessors.

Business Green quoted Paul Davies, a senior partner at PWC, which is involved with GDFC, as saying that the company would take steps to ensure the credit checks do not make it impossible for poorer households to access the loans and undertake energy efficiency improvements.

"We have to do a credit check but the threshold for getting a Green Deal loan should be lower than if they were getting a loan for the same value," he said. He added that it has yet to be determined where exactly the threshold will be.

However the website also quoted a number of prospective Green Deal Providers as saying the checks ran contrary to the scheme's goal of making energy efficiency upgrades accessible to everyone, while the National Housing Federation warned that the checks should not penalise 'very low income and vulnerable groups'.

No doubt critics will point out that this seems to run counter to the whole concept of Green Deal as a loan on the property not the individual. If that principle is threatened, it could be a very bad day for the whole scheme.

Number crunching

With the economic case for renewables ever strengthening, **Jerome Baddley**, sustainability services manager, and **Estelle Nma**, project support officer, shed light on the heating fuel cost comparison findings of the Nottingham Energy Partnership (NEP)

NEP energy services is a charity owned social enterprise. One hundred per cent of the profit from our international award-winning domestic energy services and organisational sustainability consulting is spent on funding community programmes to cut carbon and fuel poverty.

About six years ago we were asked by a householder whether it was cheaper or more sustainable to heat a static caravan with butane, oil or biomass. We realised that we had no level set of metrics with which to compare cost of delivered heat and annual CO2 emissions for these fuels. From this our energy cost comparison tables were devised. Every month since then we have been tracking and publishing energy costs, across a basket of fuels, particularly for the off-grid market.

Off-grid heating is typically via electric storage heater or fuels such as kerosene and LPG, increasingly though there is a demand for biomass and heat pumps. The emerging incentives for renewable and low carbon heating, including the Renewable Heat Premium Payment (RHPP), the Renewable Heat Incentive (RHI) and Feed-in Tariffs (FiTs), have increased public interest in understanding the relative economic benefits of switching to alternative heating sources. This is particularly the case in off-grid locations. As such the use of our comparison tables has increased.

Good advice

At NEP we watch the market trends across the off grid domestic heating market and keep an eye on improvements in technology and emerging funding regimes, so that we can give good advice to communities and householders.

In the last two and half years, there has been a significant increase in the cost of all fuels, with the highest increase (33 per cent) seen in the online rate for electricity and bulk LPG. While starting from a low base the rise in the online rate for electricity, has pushed up the resulting cost per unit for heat from heat pumps, though efficiency improvements have drawn some of this back. The lowest rate of increase though starting from a higher base has been on wood pellets (15 per cent).

The price of wood pellet usually remains stable in the summer months and increases during the winter months, when the demand is high. The highest recent price peak was recorded in Dec 2010. The introduction of RHI and RHPP should drive the demand for this fuel. Currently the UK is oversupplied with pellet, a large proportion of UK pellet is exported, so significant price fluctuation with rising demand is not very likely.

Kerosene, commonly used as an alternative to traditional gas central heating, has shown an increase of 29 per cent since March 2010. The highest peak was recorded in Dec 2010. The prices have been fairly stable, sometimes falling over the summer months rising over the winter months.

LPG is usually cited as the most suitable alternative for home heating, for those not on mains gas supply. The price however has been consistently higher than heating oil, save the oil supply bottleneck in Dec 10 that caused a short term price spike. The margins between the two fuels seem unlikely to narrow. LPG has shown an increase of 33 per cent since March 2010, with the highest peak in November 2012.

In comparison with LPG and heating oil, natural gas is the cheapest and has the lowest carbon emission. Mains gas price has risen gradually since March 2010, with an overall increase of 24 per cent over these years; the highest peaks being October and November 2012. The delivered heat from air source heat pumps, has very closely tracked natural gas over the last two years.

Increasing costs

Electricity is the most expensive source of heating fuel with the highest carbon emissions. It has shown an increase of 22 per cent for standard rate and 33 per cent for online rate since March 2010 with the highest peaks in October and November 2012.

The performance of heat pump systems is dependent on several variables such as the source temperature, the heating system temperature and mechanical efficiency. The

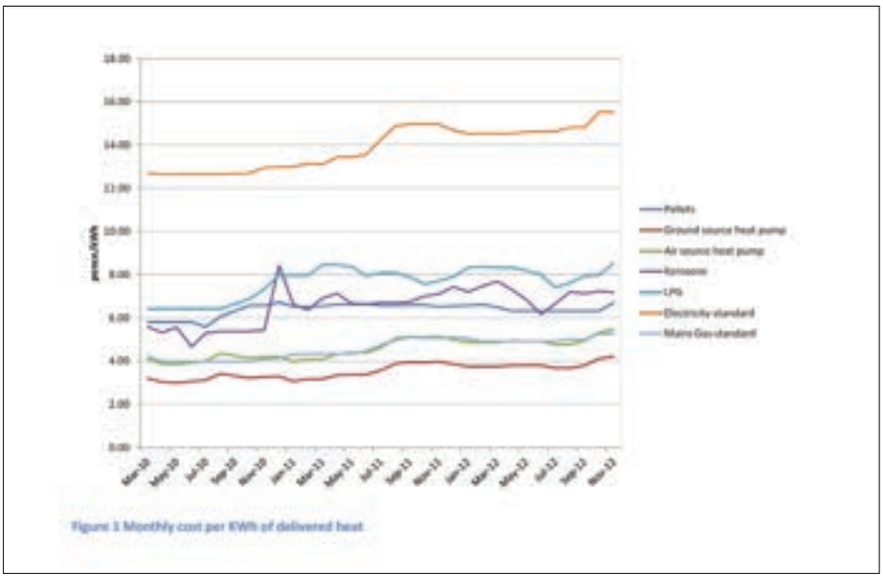

Figure 1 Monthly cost per KWh of delivered heat

Over the last two and a half years, the highest cost increases (33 percent) have been in electricity and LPG

Cost comparison of heating fuels – November 2012 update

Fuel source	Units	kWh provided per unit of fuel	Price per unit of fuel (p)	Efficiency of system (%)	Price per kWh (including boiler efficiency) (p)	Cost per annum*	Annual CO2 (kg)
Electricity – standard	kWh	1	15.53	100	15.53	£2,561.94	9732
Mains Gas -standard	kWh	1	4.72	90	5.24	£865.00	3741
Kerosene	Litre	9.80	63.4	90	7.19	£1,186.22	5175
LPG	Litre	6.66	51.08	90	8.52	£1,406.39	4272
Pellets	Kg	4.62	27.84	90	6.69	£1,104.67	643
Coal	Kg	6.85	33.63	75	6.55	£1,081.01	6836
Ground source heat pump	kWh	1	14.72	350	4.21	£694	3041
Air source heat pump	kWh	1	14.72	270	5.45	£899.63	3893

Based on an annual heating demand requirement of 16,500kWh for an average UK home

better the performance, the lower the cost required to run the system. We base our delivered heat costs for heat pumps on the cheapest available online energy tariff. As utilities have gradually withdrawn these lower tariffs both systems have shown an increase in per unit cost for delivered heat of 32 – 33 percent since March 2010, with the highest peak in November 2012.

The typical heating demand for an average UK household is 16,500kWh. For a very cold year like 2010/11, the heating demand would obviously be higher. If high demand coincides with high unit cost for heating fuels, the resulting annual heating cost for this year can be far higher than usual. If bulk delivered fuel is required urgently in periods of higher cost, the average household bill can end up far higher, as with customers needing to buy oil in Dec 2010. In these periods heat pumps could offer far more security of supply in heating, with no need to rely on deliveries and resilience in price, as prices are agreed and contracted beforehand.

A winning number

Paul Kingswell, commercial manager of Jaga Heating Products (UK) discusses how twinning heat pumps with fan-assisted radiators are a leading win-win choice for MCS installers

In order to reach the government's sustainability target of 15 per cent renewable energy generation by 2020, the building industry has seen several incentive and quality control schemes introduced – including the Renewable Heat Incentive (RHI) and the Microgeneration Certification Scheme (MCS).

To utilise these schemes, the heating industry has created better ways to achieve energy efficiency whilst still heating effectively. One such advancement is Jaga's Dynamic Boost Effect (DBE) technology. This fan-assisted technology makes it possible for discreet, non-bulky radiators to work efficiently with virtually all heat pump technologies – a 'green' heating solution strongly supported by MCS installers.

Fan-assisted radiators

For renewable energy installers, the MCS is an exciting incentive. Supported by the Department of Energy and Climate Change (DECC), the MCS certifies mirogeneration technologies from renewable sources – demonstrating not only the quality of products but also the quality of installers.

With the MCS covering all heat generating technologies up to 45kW, fan-assisted radiators such as Jaga's, were crowned top performers in the "Heat Emitter Guide for Domestic Heat Pumps," published as part of the MCS MIS3005 Standard. The MCS assists installers in selecting the right emitters to provide high thermal efficiency and low running costs. Jaga's Strada DBE fan-assisted radiator was named as an ideal heat emitter in a system designed to the best practice recommendations found in the publication's Guidance Table. In conjunction with heat pumps, fan-assisted radiators can cover a wide range of applications, with flow temperatures all the way down to 35°C, and heat loss loads from 30 w/m² up to 120 w/m².

With these findings, the misconception that under floor heating is the only viable heat delivery option for use with heat pumps, is becoming recognised as a myth. The low-flow temperature associated with heat pumps has traditionally meant they have been better suited to use with under floor heating (UFH) because of the large surface area required for effective heat distribution. However, due to the introduction of DBE technology, heat pumps are now able to work with smaller radiators, with the ability to boost heat output by as much as 250 per cent.

Show me the money – the incentive to go green

The Ground Source Heat Pump Association estimates 40 per cent of C02 emissions are derived from traditional radiator-heated properties. However, those with low mass heat emitters featuring integrated DBE technology have been proven to emit over a tonne less C02 in a year. Also, working in conjunction with Low-H20 technology – the low water content and low mass heat exchanger unit – a radiator can weigh one tenth of a traditional radiator and contain one tenth of the water. This increases the reaction speed of up to three times that of a traditional radiator – ultimately translating into fuel savings of around 10 per cent.

Team effort: The Dynamic Boost Effect (DBE) technology makes it possible for discreet, non-bulky radiators to work efficiently with virtually all heat pump technologies, says Jaga

Incentives like the RHI scheme are effective ways to entice all property owners to opt for this technology. However, to be eligible for the 'cash back' benefits, the installations of fan-assisted radiators and heat pumps need to be fitted by an MCS certificated installer – motivating installers themselves to 'go green.'

Get certified

With the introduction of sustainable measures aimed at helping the nation achieve carbon reduction targets, the building industry continues to become more energy efficient – with the combination of fan-assisted radiators teaming with heat pumps and leading the way.

However, the MCS certification is a requirement throughout the product purchase and choice of installer, for homeowners to be eligible to reap the rewards of such incentive schemes. This customer demand for the MCS mark means big opportunities for the renewable energy installation industry, and installers must ensure they are MCS certified to take advantage of this requirement.

Marriage made in heaven

With a combination of the required training and a supplier that offers first class design, a heat pump installation should achieve the best possible performance without complications, says **Nu-Heat**

Many heating and plumbing engineers will be able to make the move from traditional technology to heat pump installation without much difficulty, as long as the right foundations are laid.

All heat pump installers should be certified through MCS to enable customers to meet the criteria for Renewable Heat Incentive (RHI) grant payments and future tariffs, as well as ensuring installation standards are met. Achieving MCS accreditation requires training to a recognised qualification (Logic, EAL, BPEC or NICEIC) in each technology the installer wants to offer. The exact requirements will need to be checked as qualifications including Unvented Hot Water G3 and Water Regulations 1999 are required in addition to technology-specific qualifications. Certification is given after all elements of a renewable technology installation have been assessed.

With every relevant system supplied Nu-Heat provides the technical and installation information needed to meet MCS requirements, thereby reducing paperwork for the installer.

Once training and MCS accreditation is in place, the installation of a heat pump should be relatively straightforward. Nu-Heat systems, for example, come with a detailed installation manual and every component necessary for the installation, saving time on trips to a plumbing merchant for the installer, as the only extras should be copper pipe/connectors and some wiring. Nu-Heat also offers free technical support throughout an installation period and inclusive commissioning support, including checking the heat pump system prior to MCS inspection.

Perfect partners: According to Nu-Heat the relationship between installer and supplier is key to the success of a heat pump installation

Design and system specification

The correct design and specification of a heat pump system is one of the most important aspects of installation, as an incorrectly sized heat pump is likely to result in an inefficient system that costs more to run than the original system. To ensure correct sizing, Nu-Heat uses its own specialist software, Predictor. Predictor uses performance simulation and takes published data from various manufacturers into a common platform, so performance levels of any model and any make can be easily compared. Design calculations will include geographical location, building construction, air tightness, heat loss and how the building will be used. The heat pump must be sized correctly to meet the MCS heat standard MIS3005: this requires a heat pump to heat 100 per cent of the property for at least 99 per cent of the heating season.

A heat pump installer can offer integrated technologies to give customers even greater efficiency. The choice of emitter is key – oversized radiators or high efficiency radiators may be specified, but underfloor heating (UFH) is potentially the best option, as it gives the best performance at the lowest flow temperatures and has the added benefit of giving greater design freedom. Where solar thermal is integrated, an average saving of 50 per cent will be achieved on water bills, depending on location and the amount of sunshine. A fully integrated heat pump, UFH and solar thermal system will give the best performing system.

Customer confidence

Once a heat pump is installed and commissioned, the installer needs to make sure that the customer is given the required information for them to feel comfortable with the operation of their new heating system. Nu-Heat supplies installers with a comprehensive customer handover pack that fulfils a large part of the MCS requirement for each installation.

The relationship between installer and supplier underpins every successful heat pump installation. Working with a good supplier will give the installer confidence that the system design and support throughout will result in a successful installation and a satisfied customer.

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The time is now

Chris Higgs, Solfex, outlines his case for why he believes 2013 will be the year of the heat pump

Looking ahead: The Solfex stand at Solar Power UK. The company is offering heat pump expertise and feels this year will be a good one for the heat pump market

Knowledge regarding design and installation is at an all time high. More importantly however, is the increase in designers and installers who are genuinely passionate about the technology. With passion comes innovation and an enthusiasm to ensure all aspects of a project have been considered. An increase in project specific design and installation will ultimately ensure that the equipment and system operate as efficiently as possible. Naturally this will ensure that heat pumps (specifically air source heat pumps) are seen in the best possible light from an engineering rather than accountancy perspective.

The Department of Energy and Climate Change and the Heat Pump Association have done a fantastic job of building tools from the ground up which apply directly to installers when designing the air source heat pump system as a whole. One of the best tools is the heat emitter guide. The heat emitter guide enables keener consideration of the emitter circuit to be undertaken. Two years ago, high temperature was the go to equipment for any project with a radiator emitter circuit. Nowadays, with a keener design ethic and sharper decline in medium temperature air source pricing versus the high temperature equivalent, the cost differential between the two types of air source units can now be utilized to change x number of radiators within the property to suit a lower flow temperature. Ultimately, this is the entire ethos of air source heat pumps; smarter design and installation yields higher efficiencies. The Solfex / Samsung air source heat pump provides what it believes to be the most cost-effective way to approach this medium temperature requirement.

In relation to my original point regarding momentum of the air source heat pump market, figures from MCS accredited installers/installations tell the story. The UK had around 5,500 MCS installed air source heat pumps nationwide in 2012, which is an approximate 25 per cent increase on 2011 installation figures. This is set against a backdrop of 876 MCS accredited air source heat pump installers. Again an increase over last year, this time of 5 per cent (Dec 2011 to Dec 2012).

There is no doubting the fact that conclusive information regarding the RHI is needed to kick start the air source heat pump market

There is every possibility that total UK air source installations will be close to 12,000 before the publication of the RHI policy for deployment in March 2013. This equates to around a 49 per cent increase over total installations up to and including March 2012. Couple this together with the potential that MCS accredited air source heat pump installers will total 900 by March 2013 (a 4 per cent increase from March 2012) and the momentum is much more apparent.

This is all taking in to account the obscurity in relation to the Renewable Heat Incentive (RHI). There is no doubting the fact that conclusive information regarding the RHI is needed to kick start the air source heat pump market from a consumers perspective. There are thousands of potential consumers, who are waiting for final information about the RHI in order to make an informed decision. It's a generally held belief that a large number of these potential consumers would be actual consumers had obscurity not surrounded the Renewable Heat Inventive.

With this said, without confirmed information, the RHI package is still extremely attractive. Taking into account an approximate 18,000kWh of heat energy usage per year per household (average gas consumption as provided by Ofgem, 2011), even at the lowest proposed tariff, the 20 year heat usage to be split over 7 years will equate to a subsidy of around £1200 per annum. With a typical supply and installation costing around £6,000, a payback of around five years is more than possible, with the remaining two years of entitlement acting as a very attractive addition for early adopters of the technology. The year for air source heat pumps is undeniably 2013.

SOLFEX energy systems

The natural choice

With interest increasing in phase 1 of the RHI and phase 2 due to launch in the summer, **Andy Buchan** of the Cotwold's Energy Efficiency Centre (CEEC) outlines why the case for biomass remains as strong as ever

Of all the renewable technologies we are involved with at CEEC, biomass is the most carbon neutral. As we burn biomass it releases carbon dioxide which is re-absorbed into plantation, giving a neutral cycle. If a fallen tree rotted on the ground over ten years it would also release carbon dioxide, only at a slower rate.

We have seen a huge demand in the Cotswolds for biomass boilers as an alternative to oil and storage heating. There is a large growth in the commercial sector due to the active phase 1 Renewable Heat Incentive (RHI). This is a two tier tariff with tier 1 at 8.3p/kWh and tier 2 at 2.1p/kWh. It is a 20 year tariff and is adjusted with inflation. Such is the generosity of the tariff that there are companies which will install and service the plant free of charge in exchange for the tariff. This scheme is known as either ESCo energy Service Company or HSCo heat supply contract. These types of contracts would be offered to businesses that have a minimum of 200,000 kWh of energy requirement per year to make it worthwhile for the investor.

Stacking up

A pellet boiler stacks up well against oil or electric – it is a cheaper fuel and with the RHI it makes it a no brainer. The domestic tariff phase 2 is due to be announced in March for commencement in 2013 for a period of seven years. However, as a pre-payment incentive we can obtain a grant from the Renewable Heat Premium Payment of £950 and when the RHI kicks in next summer the end user can access the tariff. This applies to all installs since the 15th July 2009 (as long as the property meets the insulation requirements and the home owner will also need to have a Green Deal assessment before claiming the RHI).

One of the most frequently asked questions we get is will we run out of pellets in the UK? This is very unlikely. I recently spoke to a pellet supplier who told me that 60 per cent of his pellets were exported.

We have installed pellet boilers with hoppers which are manually filled by tipping bags into the top of the hopper. In bigger properties we have installed silos to accommodate blown pellets which are then either augured or vacuumed from the silo into the hopper. They need to be maintained on a regular basis and with a good grade of pellets the ash content should be less than 1 per cent.

Bespoke solutions

82 per cent of homes in the UK are heated by natural gas, leaving 18 per cent either heated by oil, coal or electricity. These homes can benefit from biomass boilers in addition to heat pumps. However, in an existing property a heat pump may not have the heat capacity, with only a single phase electrical supply available. Heat pumps also provide low energy so you might need to upgrade your radiators. A biomass boiler, however, will produce high energy to service the existing radiators and only requires single phase electricity.

In demand: Andy Buchan, CEEC, explains why biomass, being the most carbon neutral of all renewables technologies, is growing in popularity

The skills set

As the Renewable Heat Incentive draws ever closer, many installers are looking to biomass as a key sector going forward. **HETAS'** biomass training is proving popular with those looking to gain expertise in this important area

In the know: With the RHI on the horizon, installers are looking to increase their biomass knowledge and the HETAS course is proving popular

With the imminent launch of the Renewable Heat Incentive (RHI), the biomass heating sector looks set to receive a kick start in terms of support for new installations. Under the RHI households will receive incentives for upgrading their existing heating systems with renewable energy, including biomass boilers, solar and heat pumps. Many installers are already gearing up to take advantage of the extra work by getting trained and assessed to HETAS standards.

Training demand

According to Andy Mathews, HETAS training manager, demand for the H005 biomass training course has increased this year as more details of the RHI have been confirmed. He says: "When the original course was launched in 2009 it was viewed with some scepticism, but with the availability of grants and incentives for biomass heat generation the course has gained in popularity. There are now 12 HETAS approved training centres throughout the UK and Ireland offering the H005 biomass course."

Something for everyone

The course is aimed at heating engineers who already work dry or wet stoves and have existing HETAS qualifications. However, there is also a direct entry route aimed at gas and oil heating engineers who want to install biomass systems. The H005BR version of the biomass course is one day longer than the standard H005 four day course, and covers building regulations, legislation and standards in addition to the standard course content.

Wide-ranging content

Both versions of the HETAS biomass training course cover appliances up to 45kW, but the same theory applies for installations up to 100kW including log, pellet and wood chip appliances. With a mix of theory and practical elements the course enables installers to carry out feasibility studies, and to professionally advise their customers on fuel type, storage options and system design. It also covers marketing and the various grants available for biomass systems under the RHI.

Upon completion

Successful completion of the biomass course allows HETAS registrants to extend their registration categories to include installation of biomass appliances. The course is also important for anyone who wants to become a certified Microgeneration Certification Scheme (MCS) installer. In addition, the knowledge and experience gained from undertaking the course provides an important foundation for the installation of biomass appliances and associated equipment under MCS.

Many installers are already gearing up to take advantage of the extra work by getting trained and assessed to HETAS standards

Singular approach

Last year, when Enphase discussed its expertise at the REI's Business Strategy Conference at the British Museum as one of the event's sponsors, the importance of microinverter technology was highlighted. **Paul Nightingale**, UK managing director discusses

Inverters are a fundamental component in solar PV systems. It is the inverter that converts direct current (DC) from solar panels into alternating current (AC) for use in our homes as well as transmitting power to the grid.

Linked in series, standard string inverters operate by combining the voltage and current of all panels into a single output that is fed into a central inverter. Whilst this process is tried and tested, it often does not yield the maximum efficiency possible. The linking together of panels to form one interdependent unit means that any interference with one panel affects the entire system. It can take anything from a leaf to a spot of shade falling on a module for a reduction in the system's energy output, giving rise to a drop in efficiency across the array.

In order to combat this, an alternative approach has been generated over the last few decades. The answer to this problem is the microinverter; it treats each module as an individual unit that operates independently within the solar array. Microinverters convert DC into AC current directly, at the panel level, rather than through a string, overcoming the issue of a single point of failure in standard string inverters.

The history of the microinverter is, like any new technology, not without its setbacks. While widely acknowledged as more efficient, the technology has faced challenges of manufacturing cost, unit reliability and power conversion efficiency. It wasn't until 2008 that the first commercially viable microinverter launched into the market.

Enphase Energy's co-founders Martin Fornage and Raghu Belur rebuilt the solar inverter with a 'no compromise approach' from the ground-up. The Enphase Microinverter has since rapidly become recognised as the leading product increased energy harvest efficiency conservation. Furthermore, according to the latest IMS reports, microinverters are in fact the fastest growing segment in the solar PV inverter market, with a growth of 180 per cent in 2011.

Enphase's technology is designed to optimise the power conversion process by adapting the system to changing environmental conditions (shading, dust and debris, non-uniform temperatures, sub-optimal irradiance angles etc.). So if one panel suffers from environmental interference or failure, it doesn't affect the entire array, thereby significantly reducing the risk of catastrophic system failure and increasing the solar PV system's efficiency.

What's more, Enphase's third generation microinverter technology offers a limited warranty of 20 years – as much as four times the warranty of most standard inverters. With each successive generation, Enphase has incorporated design improvements and learning from over 2.6 millions units in the field. As a result, the reliability of the product continues to improve and continues to be validated by an increasing body of data.

Enphase Energy's co-founders Martin Fornage and Raghu Belur rebuilt the solar inverter with a 'no compromise approach' from the ground-up

A major advantage of the Enphase offering is the incorporation of a platform for intelligent energy management. The Enphase Microinverter System includes Enlighten – an advanced monitoring and management software which, unlike conventional monitoring systems, which only monitor the inverter, continuously monitors the health and performance of every solar module and microinverter in the array. This delivers relevant and actionable data to system installers and owners remotely via the web and a mobile app.

Small wonder: Paul Nightingale, Enphase discusses microinverter technology

To date, Enphase has secured over 20 patents and is constantly working towards developing and enhancing its technology to meet consumer and industry demand. Having conquered the US market Enphase launched in the UK this summer and the Enphase Microinverter System is now available through authorised distributors. Enphase's microinverters are designed to provide solar PV systems with the most advanced solution for DC to AC power conversion. The technology is set to have a significant impact on the UK's solar industry.

Small talk

Incorporating micro-inverters into future solar installations is a hot topic within the PV industry, says **Dr Marco Trova**, director of technical sales, Power-One

Micro inverters or module inverters are especially well suited for small, residential installations as they minimise efficiency losses from shading or panel mismatching. But which pieces of information need to be taken into account when deploying micro-inverters? And how does the right plant monitoring help to maximize the energy harvest?

The small panel-mounted DC to AC converters offer various advantages including an easy installation, greater design flexibility and panel-level monitoring. Furthermore, micro-inverters reduce the susceptibility to fault, since only the energy produced by the affected module will be lost in case of a component failure.

Usually, different aspects restrict the plant design, including panel type, usable surface area, the number of Maximum Power Point Tracker (MPPT) channels or the cabling and mounting system. Here, micro-inverters offer greater design flexibility.

Since every module is equipped with its own inverter, a DC string concept is no longer necessary. Roof pitches that could not be reached with a two MPPT channel string inverter can now be equipped with additional modules, increasing the usable area. Furthermore, micro-inverters with a broad input voltage range like the Aurora Micro allow deploying modules of different make and performance. While this would affect the entire string's performance in a string inverter installation, panels with micro-inverters are completely independent from each other. This ensures system expandability at panel-level or module replacement without requiring string re-sizing.

The alleged poor efficiency of micro-inverters is one of the prejudices they still have to refute. However, some devices already reach efficiency levels that are worthy of much bigger inverters.

Maximising efficiency

One of the main benefits of micro-inverter installations is that each module benefits from a separate MPPT catching creating the optimum power point. This minimises efficiency losses from irregular shading and eliminates other types of mismatching or module differential aging. While the module with the lowest power would limit the entire string's performance in a traditional installation, each micro-inverter equipped panel works in optimal conditions. At the same time, micro-inverters reduce the susceptibility to fault, since a component failure only affects one module instead of an entire string.

The speed and ease of installation are additional advantages the devices offer. As they are installed on the panel's backside, the usage of cabling, terminal boxes, switches or DC fuses is no longer necessary, thereby making the AC wiring rather easy. Moreover, new devices like the Aurora Micro are suitable for panels which require no grounding or the grounding of the positive pole.

The alleged poor efficiency of micro-inverters is one of the prejudices they still have to refute

By allowing easy monitoring at panel-level and fast fault identification, micro-inverters also offer crucial benefits regarding monitoring. With additional monitoring devices wireless systems can be installed giving real-time updates on the energy production. This allows for controlling the energy produced by a single module or the entire plant quickly and easily.

Little gem: The micro-inverter market has turned into one of the fastest growing segments of the PV industry, says Dr Marco Trova

Usually, possible reductions in production caused by unexpected shade or dirt on the panels can lead to significant loss in revenues. Here, monitoring devices help to discover and localise any malfunction or reduction in the plant's power generation at individual panel-level, enabling a quick and precise solution.

Positive outlook

By offering various advantages compared to centralized inverters, micro-inverters have developed into a real alternative to traditional string inverters and are one of the fastest growing segments in the UK PV industry. Especially small, residential installations which have to cope with difficult conditions like shading or panels at multiple orientations benefit from micro-inverters.

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Heat wave

Alex Savidis, renewable energy specialist and associate director, Wardell Armstrong, discusses the solar thermal sector and asks – has the time come to restore its good name?

The over-aggressive selling of overpriced systems gave solar thermal technology a bad name in the 1990s and early 2000s. The critical mistake was to claim that it could be used for domestic space heating – not viable with a huge excess of heat in summer but not enough in colder seasons when there's less sunlight available.

But in the area where they do excel – domestic hot water – solar thermal systems can outperform solar PV and other alternatives in efficiency, installation cost and energy generation cost.

Comparing costs

This is especially true for new-build. For an installed cost of around £700, a system of just 3m² can heat water for 2.3p per kWh over its 25 year life. That compares with a typical new build installation cost of £3,600 for a 3kWp solar PV system which will produce electricity for 6.0p per kWh over its lifetime.

A retrofit 3m² solar thermal system comes in for around £3,200 (compared with £4,500 for a 3kWp solar PV system), heating water for 10.7p per kWh – slightly more than the 7.5p achieved by our comparable PV system which takes up far more roof space.

Solar thermal systems score well on efficiency too. They're able to convert available sunlight into useful energy at around 40 per cent overall efficiency, comparing very favourably with 11 per cent for PV.

Size is important

The key issue, however, is correct sizing. Too small, and they don't generate enough energy. Too large, and you're left with overheating problems in summer. They're not as scalable as solar PV systems, and there's no long term storage. They have to be used locally too – unlike excess electricity from solar PV, which can be exported.

The heat is on: According to Alex Savidis, Wardell Armstrong, solar thermal systems can outperform solar PV and other alternatives in efficiency, installation cost and energy generation cost

But do we have enough sun in the UK to make solar thermal systems a viable option? The thing to stress is that although they work best when it's sunny, they also work to a lesser degree in cloudy conditions – and almost as well in the freezing cold provided it's sunny. So in Scotland we can expect about 1000 kWh of solar energy per square metre per year, and about 1200 in southern England – compared with 1800 in mid Spain.

When correctly sized and used domestically (especially on new build developments), solar thermal can be a great way of providing about 50 per cent of the overall energy that's needed for hot water over the course of a year. It has other attractive uses too – in swimming pools where lower water temperatures are required, and in industrial processes that call for large volumes of hot water.

Government support

The grant situation in the UK adds an interesting dimension. Government support for solar thermal technology is poor compared with other renewable technologies. Renewable Heat Incentive (RH)I tariffs are relatively low but can still make a solar thermal project viable. The domestic strand is currently limited to a one-off grant of £300 – less than 10 per cent of the retrofit capital cost. But proposed changes may result in a higher tariff over a shorter period that could change the market dynamics. In the commercial area, a tariff of 8.9p is payable for every kWh generated for a 20 year period – not that favourable unless you are displacing more expensive fuels like LPG or oil.

There's a strong case for giving greater support to solar thermal as an effective, renewable technology that draws on a free, inexhaustible and predictable source. Let's hope the government sees its full advantages as it reviews the financial incentives for renewable energy.

Deal or no deal?

Phyllis Prior-Boardman, executive director at Green Deal Consortia, gives the lowdown on what the Green Deal will mean for the renewables industry

The renewables sector has seen many highs and lows in recent years, and with the Green Deal due to boost low carbon growth, it is sometimes unclear as to where the sector fits with these opportunities.

Firstly, it is important to consider that the Green Deal is a small part of the overall low carbon economy, being a new and innovative way to fund energy efficiency measures. The UK is at the cusp of a major drive towards clean energy due to carbon emission targets and climate change, unsustainability of fossil fuels, and energy insecurity. The social impacts of energy are extremely detrimental to society due to rising energy bills, creating higher occurrences of fuel poverty. The renewables sector has a significant part to play in addressing these issues and but is its future guaranteed?

Fortuitously, UK figures show there was a clear increase on the first quarter of last year across all renewable technologies. In spite of the lack of confidence arising from the decision to reduce the Feed-in Tariff (FiT), the UK is powering forward on clean and secure energy and is subsequently becoming increasingly attractive to investors.

Investment catalyst

The new Green Deal is designed to improve energy performance of buildings, meet UK carbon reduction targets and reduce rising energy bills. It is deemed a catalyst for private investment to boost growth and stimulate the economy. The concept is a determined effort by government to create a new market where corporate companies and small businesses may compete in delivering 'Green Deal plans' to customers.

The ability to raise private finance for renewables is vital in the new market as the £1.3bn worth of Energy Companies Obligation, from the main utility companies, does not cover renewable technology. However, renewables are key elements of the "measures" framework to attract Green Deal private finance.

These measures are microgeneration and renewable heat technologies and are eligible for Green Deal finance. Therefore, if a customer wishes to install a heat pump, or solar PV, they will be able to off-set the cost with Green Deal finance up to the level of the estimated savings for those measures in their property.

Golden Rule

Furthermore, Green Deal finance, FiTs and RHI will complement and work together as a package with the potential for marketing energy efficiency measures, renewable heat and energy generation products together as packages of improvements. However, to avoid double subsidy, customers will not be able to fund the Green Deal's Golden Rule from the probable future revenue from, for example, FiTs as savings for the purposes of meeting the Golden Rule.

In addition, this approach to energy efficiency measures and renewables technologies working side by side will enable the most cost-effective improvements as RHI payments will be conditional on ensuring renewable heat is not wasted. This approach mirrors the rule for receiving of the full rate of FiTs payments for PV installations from 1 April 2012, which is now conditional on the building meeting an energy performance rating of D.

Doing a deal: Phyllis Prior-Boardman, Green Deal Consortia, discusses the Green Deal and renewables

With or without the Green Deal, the renewable sector has a significant contribution in tackling climate change. The government is committed to increasing renewable energy to make energy secure, protect consumers from fossil fuel price variations, drive investment in new jobs and businesses in the renewable sector, as well as meeting carbon reduction targets. The UK is dedicated to generating 15 per cent of energy from renewable sources by 2020. This means a viable and confident market share for the renewables sector.

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Take my advice

Peter Cunningham is a man with renewables in his blood. Having worked in the industry for many years, he now runs a renewables advice service in his area. He shares his experience and offers advice on renewable energy installations

I have been passionate about renewable energy all my adult life since I saw my first solar panel 40 years ago. After a career as chartered consulting engineer and finally chairman of an established renewables installations company in Surrey, I retired in 2010. My wife and I moved to south Cornwall where I realised a lifetime ambition and built my own low energy home, designed to maximise benefit from the government cashback schemes - the Feed-in Tariff (FiT) and the Renewable Heat Incentive (RHI). I also set up a pro bono renewable energy advice service for my local community (there is a case study of my own home on the website).

I fund the service myself with no fees payable by the client other than a voluntary charitable donation. See **www.renewablescornwall.com** The catalyst for setting up my service in 2010 was the mis-selling, profiteering and inappropriate installations I saw being carried out by a rogue minority of installing companies attracted to the industry by the initial high Feed-in Tariff (43p). I have seen some appalling installations supplied with only one thing in mind – profit for the installer - particularly in the solar energy sector. In October 2011 I was still seeing quotations of £20,000 for 4Kw of solar PV from national companies employing commission-driven salesmen when equipment costs were down to only £5,000 or so. Hopefully, the lowering of the FiT and the promotion of best practice by the installation community, trade bodies and magazines like REI will mean the complete eradication of this rogue element from our industry. Until then caveat emptor (buyer beware) still prevails.

Hopefully, the lowering of the FiT and the promotion of best practice by magazines like REI will mean the complete eradiation of this rogue element from our industry

Wise words

My basic advice to clients is to seek quotations from at least three local, experienced (in business for at least two years), MCS/REAL-accredited installers by inputting their postcode into the MCS website. I encourage my clients to speak to and visit a previous customer of their selected installer. Often I will arrange for the quotations myself on a common specification basis and assist the homeowner with installer selection and keep an eye on progress. Many of my clients have been confused by the claims and counter claims of installers, manufacturers and advice sites and were reluctant to invite a salesman into their home. In addition, whilst the government services like the Energy Saving Trust are excellent and provide website and telephone advice they will not visit a client in their own home. The demand for my services in my local community proves this is necessary.

Renewables for all

Solar PV installation costs for the typical 4Kw domestic system are now down to the probable floor price of £5,000 - £6,500 with the FiT at 15.44p per unit. With the coming Green Deal we are approaching the Holy Grail of "renewables for all" – not just the wealthy few. The next great leap forward will be in energy storage for those times when the sun isn't shining and the wind isn't blowing. I have recently installed my own design of low cost storage system and hope to go off-grid completely making utility company energy tariffs irrelevant!

Guiding light: Peter Cunningham, his renewable energy advice service is proving invaluable to residents in his area

As domestic consumers we choose to spend money on expensive cars, high fashion, jewellery and luxury goods rather than use our capital or take action to reduce our profligate energy consumption or invest in renewable energy. If nuclear is energy is seen as unsafe, there is no other alternative but investment in energy efficiency and in those energy systems which use the free, clean, safe and everlasting fuel all around us. Visit the "Energy Madness" page of my website to read more of my rant on the subject!

Need to know

REI's consumer focus has been a popular read for consumers seeking renewables advice at Ecobuild for the last two years. Many householders seek reputable, trustworthy expertise. **Jason Hobbins**, managing director of EnergyMyWay, advises on finding a solution that suits the property

The renewables industry has grown recent years, with new products and innovation emerging and government subsidies supporting its development. This is good news for consumers but has also led to an overwhelming amount of information. So where does the homeowner start?

Building a sustainable home from the ground up presents the perfect opportunity to integrate renewable energy and energy efficiency measures into the early stages of design. Simple measures such as ensuring under-floor heating is designed to integrate with the customer's choice of air source heat pump can make a big difference to the efficiency of a heating system. Our advice would be not to assume the architect is a specialist in energy efficiency and renewable energy. EnergyMyWay works in partnership with architects to help design and specify the best renewable solution for individual clients.

For a renovation, the fabric of the building will influence options. An expert can advise on the most effective technologies that will give the best results for a renovation project.

Fabric first!

Our motto for all energy efficiency is 'Fabric First'. Before considering any renewable energy additions, the building should be well insulated and efficient. Technologies such as heat pumps only operate effectively in well-insulated buildings.

Heating and hot water options

There is an efficient renewable heating solution for nearly every type of property. If the property is an older construction and in a rural location, a biomass boiler is an efficient alternative to oil or LPG. Well-insulated properties may be better suited to a ground source or air source heat pump. A renewable energy expert can help the customer choose the best heating system, correctly sized and specified for an individual property and heating requirements. For high hot water demands, hot water bills can be reduced with solar thermal or a hot water heat pump.

Electricity options

Solar PV is the most popular renewable energy technology for UK homeowners. Panel prices have dropped making it more affordable to start generating solar electricity. The government's Feed-in Tariff rewards the customer for installation, giving 20 years of tax-free income on top of bill savings. You don't necessarily need a south-facing roof on the main property to benefit from solar. Consider a ground mounted system or an array on a garage or other building.

In the right location a wind turbine will generate power day and night, without the daylight restrictions presented by solar. Turbines also come with a generous Feed-in Tariff and there is no limit on the number of tariffs to be earned from.

MVHR

For new-builds, air tightness is a prerequisite for building regulations. This means heat loss will be reduced, however a reduced air change can lead to build up of condensation in the house. With MVHR (Mechanical Ventilation Heat Recovery) a property is well ventilated, reducing condensation. The heat that would normally be lost by opening a window is transferred to heat the incoming fresh air. The best approach to creating a sustainable property is to work with an expert who can provide consultancy, design and installation for the complete range of technologies.

What does a homeowner need to know?

Choice words: Jason Hobbins, EnergyMyWay, has a range of tactics to help the consumer make the right renewables choice.

How long has the company been trading?

If the business was established after April 2010 the company may have been set up in response to the launch of the Feed-in Tariff. Many credible companies were, but with such generous tariffs you will also find opportunists. Will they still be in the industry in years to come?

How independent is the advice?

Is the consultant able to talk about the range of technologies with knowledge and give options for product manufacturers? Ensure on getting complete picture of every option on the market.

What guarantees do they offer?

Ask for installation guarantees and interrogate how their predicted performance data has been generated.

How local are they?

This could relate to their carbon footprint but also their availability if there is a problem, what reassurances do they provide to show that they will be able to support you locally in the long-term?

What endorsements do they have?

Does the company have impartial feedback from its customers? Industry endorsement is a good sign. Have they won awards? Are they part of any industry bodies? How respected are they by their trade colleagues?

Do they offer a complete range or just solar?

Many solar companies have started selling other technologies but this may not mean they are experienced in more complex installations such as heat pumps. One clue to look for is the word 'solar' in the company name. This may indicate that they have more recently decided to bolt-on

Ecobuild – making the most of the Green Deal and RHI

With the spotlight firmly on renewable energy and microgeneration, there has never been such an important time to get up to speed on the latest legislation, training and technologies

Ecobuild (5th – 7th March, ExCeL London), the world's largest event for sustainable design, construction and the built environment, will showcase the latest innovations from leading companies across solar, bioenergy, combined heat and power (CHP), building integrated photovoltaics (BIPV), heat pumps and small scale wind technology.

Brand new for 2013, 'The Green Deal Terrace' will provide a programme of seminars and a comprehensive advice clinic to help visitors understand the ramifications from the government's showcase policy and how they can benefit.

Live demonstrations

Practical Installer is back in association with Plumb Center, also with a major focus on helping installers make the most of the Green Deal. Live demonstrations are set to provide all installers with the knowledge to take advantage of the growing demand for micro-renewable technologies.

Practical Installer is a 'working' showcase demonstrating the installation and operation of renewable and energy efficiency products in a retro-fit environment – complete with typical Green Deal energy saving and funding calculations.

Three years ago Ecobuild and Plumb Center joined forces to create an exciting live showcase arena demonstrating energy efficiency technology in a practical, dynamic and informative way. The installer has always been the focus of Practical Installer demonstrations, with 90 per cent rating them 'very useful'. At this unique event the industry's leading manufacturers come together to show how, in a retro-fit environment, these technologies integrate with products already familiar to installers. Practical Installer puts paid to the notion that these products need a different person to install then: the reality is they can be the perfect extension of a heating installer's existing business.

Winning combination

Already one of the most popular attractions at Ecobuild, Practical Installer promises to be even more exciting in 2013. Physical demonstrations of fitting technologies such as solar thermal and heat pumps will be combined with key aspects of a Green Deal assessment and the domestic Renewable Heat Incentive (RHI). So for the first time you will be able to see real life 'before and after' scenarios highlighting the impact on a property's energy efficiency - and the economic benefits - resulting from the installation of specific products.

Simon Osborne, head of product and channel management at Baxi Group, lead sponsor of Ecobuild, said: "Installers coming to Ecobuild can learn about hundreds of new products and solutions across the entire building industry. This opportunity is vital for installers wishing to differentiate themselves in the market and offer customers a wider range of solutions.

There are also lots of training opportunities available through suppliers and Ecobuild's official education programme, which gives installers the opportunity to dip their toes into the renewable market and stay a step ahead of their competitors."

Fresh focus

Ecobuild's popular Solar Hub, sponsored by Rexel, also returns with a brand new focus on the future of energy. Visitors will hear all the latest thinking, get practical guidance and advice from leading industry experts. Also returning for 2013 is Renewable Heat Focus to help de-mystify and highlight the opportunities available through the Coalition's Renewable Heat Incentive scheme (RHI).

Osborne concluded: "Ecobuild takes place in March as the heating season comes to a close each year, making it the prime time to get up to speed on the latest products and training ahead of the busy autumn period."

It's all free to attend, register at **www.ecobuild.co.uk.**

Repeat performance: Plumb Center will return this year with the Practical Installation demonstration area

Getting hands on

Produced by **Plumb Center** in association with Ecobuild, Practical Installer promises to be one of the show's most popular visitor attractions again, demonstrating the installation and operation of renewable and energy efficiency products in a retro-fit environment. Each demonstration will be accompanied by an illustration of energy saving and financial support provided through Green Deal, Feed-in Tariff and Renewable Heat Incentive (RHI)

Plumb Center says that, at this unique event, the industry's leading manufacturers – including Vaillant, Honeywell, Grundfos, Baxi, Grant, Glow-worm, Kingspan, Worcester Bosch, Fernox and JA Solar – will come together to show how, in a retro-fit environment, these technologies integrate with products already familiar to installers. Practical Installer will challenge the perception that these products need a different person to install them, when in reality they can be a perfect extension of a heating installer's existing business.

Physical demonstrations of fitting technologies will be combined with key aspects of a Green Deal assessment and the domestic Renewable Heat Incentive. You will be able to see real life 'before and after' scenarios highlighting the impact on a property's energy efficiency - and the economic benefits - resulting from the installation of specific products.

Renewables technologies will also feature strongly on the new Plumb Center stand, with product displays covering the latest releases in solar thermal, biomass and heat pumps.

Installers visiting the stand will have the chance to get 'hands-on' with Plumb Center's Green Deal e-assessment software on one of three iPads linked to an interactive media wall. Visitors will be guided by experts in the use of this package, which is available as part of the Plumb Center Green Deal Advisor course.

Plumb Center's trades people will be on hand to discuss renewable training courses and MCS accreditation, and visitors to the Plumb Center stand will also have access to exclusive show offers from leading product suppliers.

N2710

Train and gain

NICEIC will be using this year's Ecobuild to answer any questions about the rapidly evolving Green Deal marketplace.

NICEIC, which offers certification to any firm wishing to become a Green Deal Installer or Advisor, says it has already certified a number of organisations against both standards and expects more firms to get involved this year following the official launch.

Mark Smith, head of group marketing at NICEIC, said: "As a leading certifier of professional tradespeople we believe there is a real opportunity for contractors with the appropriate expertise to benefit from Green Deal. We look forward to discussing these opportunities with visitors to Ecobuild."

Winning opportunity: NICEIC will be on hand to explain the benefits of getting involved in Green Deal

Visitors to the NICEIC stand will be able to preview www.YourGreenDealHome.co.uk a new interactive website designed to provide consumers and contractors with everything they need to know about the Green Deal. In addition, the team will be offering discounts on all NICEIC books, DVD's and schemes. **N3030**

Solid solution

Berlin-based **Mounting Systems GmbH** says it has mounting solutions for all PV and solar thermal installation types on show at Ecobuild

Engineering excellence: Mounting Systems GmbH will be bringing the ground mounted Sigma II to Ecobuild

The on-roof Alpha system and the ground mounted systems Sigma I & II form a central part of the company's portfolio.

Approximately 250 employees work at its 17,000 m² production and warehouse location in Germany where the company provides professional project support using its own engineering department and production capacities in aluminum processing.

For UK customers, Mounting System's Milton Keynes office offers planning, project and technical support as well as product training.

S2530

Smart solutions

Sibert Solar will be showcasing its selection of PV installation products plus its standard range of ancillary BoS products including connectors, cables, isolators, disconnectors, and kWh meters.

Specialist circuit-protection products will also be on display from Sibert's partners Doepke (DC-sensitive RCDs) and Dehn (lightning/surge protection) and a new range of Eltek string inverters.

The company says it is excited to bring new monitoring and smart control solutions from Greenologic to Ecobuild including an example of its wireless remote kWh/CO2 display units.

New offering: Sibert Solar has added a range of string invertors from Eltek to its portfolio since 2012

Sibert Solar looks forward to meeting new and existing clients and invites all readers of Renewable Energy Installer to come and talk to them about the configuration, protection and installation support of PV systems, whether small single-phase or large-scale three-phase.

S2870

Green for go

NAPIT says it is keen to help installers visiting Ecobuild make the most of Green Deal and expand their business to incorporate the installation of cutting edge microgeneration technologies.

NAPIT is a UKAS-accredited provider of the Microgeneration Certification Scheme (MCS) as well as the Green Deal Installer and Advisor Schemes. It says that membership under these options could unlock a wealth of opportunities, granting access to a range government backed financial incentives to help you attract new customers, including Feed-in Tariffs (FITs,) the Renewable Heat Incentive (RHI), and the Green Deal financial framework.

NAPIT will be exhibiting the quality training and support it offers to help installers on the road to becoming a professional in these fields.

From solar PV and biomass training to dedicated Green Deal Advisor courses, NAPIT promises to offer the complete solution to get ahead in the UK's budding green economy.

N2125

Picture this

Clear picture: Testo will be exhibiting its newly improved range of thermal imaging cameras

Testo is heading to Ecobuild to showcase its newly launched thermal imaging cameras, flue gas analysers and refrigeration manifold.

Testo says its newly improved affordable thermal imaging cameras are the must have diagnostic tool. Used on a daily basis to help save time, they are designed to reduce costs and to generate and sell additional lucrative services for installers. It adds that the optional SuperResolution feature effectively doubles the geometric resolution of thermal images.

The company will also be displaying two new flue gas analysers. The Testo 310 is an all-rounder for basic measurements whilst the multi-function Testo 320 has a unique graphical display.

Also available to see will be Testo's top selling existing products for engineers. Versatile and uncomplicated, Testo says its 570 Refrigeration Manifold takes multiple measurements accurately and quickly when servicing and maintaining refrigeration systems and heat pumps. It is the preferred tool over an analogue gauge.

Visitors can also see a portable flue gas analyser DVD to help get the most out of your analyser, CO2 and CO monitors, gas leak detectors, thermometers and pressure meters.

Additionally, Testo offer instrument service and calibration on both Testo and non-Testo branded instruments, from its independently accredited ISO 9001:2008 and ISO 17025 laboratory based in Alton, Hampshire.

N1806

Hot stuff

Solarfocus will be at Ecobuild to present its newest building heat management system – the dual fuel boiler Therminator II (22 to 60 kW) with touchscreen.

According to the Austrian company, heating has never been as easy as the Therminator II automatically ignites log wood and pellets at the times you set. In case the boiler runs out of log wood, it is designed to keep on heating by switching to the pellet supply - fully automatically.

Simple life: Therminator II, manufactured by Solarfocus, is designed to automate most aspects of biomass heating

Another innovative product in its portfolio is the touch screen control Ecomanager touch which allows for complete building heat management with just a few finger tips. It enables remote operation of the heating system via smartphones, PCs or tablet computers.

Solarfocus says that is committed to providing installers with cutting edge technology which guarantees the highest efficiencies and lowest emissions. This results in low life-time costs and fuel savings over years.

N3735

Great expectations

PV manufacturer **Canadian Solar** says it is proud to showcase its ELPS high-efficiency module at Ecobuild 2013.

According to the company, in-house tests found that its proprietary mono ELPS solar cell efficiency reached 21.1 per cent - one of the highest performances reached to date for a P-type mono-crystalline cell.

Canadian Solar's ELPS cells feature a Metal Wrap Through (MWT) design, which moves the front busbars to the back of the cells allowing 3 per cent more light absorption per cell. As a result, Canadian Solar says its ELPS modules deliver up to 7 per cent more electricity than similar configuration conventional solar modules.

High performance: Canadian Solar says its ELPS modules have a cell efficiency of 21.1 percent

It adds that the high-performance modules feature, amongst other attributes, a positive power tolerance (0 ~ +5W), a robust frame of up to 5400 PA load, anti-reflective with self-cleaning surfaces, a 10-year product warranty on materials and workmanship and a 25-year linear power output warranty.

S2920

Small but powerful

At Ecobuild, **Power-One** will present its inverter solutions for the UK market. One of this year's highlights is the company's micro-inverters Aurora Micro-0.25 and Aurora Micro-0.3, which offer installers and home owners an alternative to the traditional string-inverters the company is more well-known for.

As many residential PV installations in the UK only deploy a small number of solar modules, Power-One says the panel-mounted devices are the perfect solution for property owners who would like to benefit from the Green Deal Scheme: With an output of 250 W and 300 W respectively, the micro-inverters are designed to be cost efficient, easily installed, and help maximise energy harvesting in challenging conditions.

It adds that since each device creates the optimum power curve for the individual conditions of the module it is attached to, each panel generates the maximum amount of energy. Thereby, losses from partial or temporary shading as well as module differential aging are minimized.

Next generation: Power-One says its micro-inverters offer installers an alternative to traditional string inverters

Due to a wide input voltage range with a maximum of 65 Vdc, Power-One says the Aurora Micro micro-inverters offer more design flexibility to installers without any constraints in terms of string sizes, topology or orientation. Power-One's smallest inverters are said to reach a peak performance of up to 96.5 per cent, which is one of the best in its class. Electrolyte-free capacitors and a robust IP65 isolation as well as HF isolation increase the product life and guarantee long-term reliability.

By linking the Aurora Micro module inverters to the internet with Power-One's Aurora CDD monitoring devices, plant operators can monitor the energy harvest produced by an individual module or the entire installation. **S3250**

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Bigger and better

Zenex Solar has set its sights on using its 40 years of experience in distribution and logistics to grow into the UK's biggest distributor of renewable products in 2013.

The Yorkshire-based company wants to spread the message at Ecobuild 2013 that whilst ambitious to grow, its key focuses remains on customer service and value for money.

Liz MacFarlane, Zenex Solar's sales director, said: "Bringing our logistical and distribution skills to the UK heating market is very exciting for us. We have four years' experience of renewables and we have 40 years' experience of distribution. Applying this expertise to our new products, we can offer the highest calibre distribution to renewable heating products as well."

Ryan Gill, the company's commercial director, added: "Zenex is looking forward to launching its latest range at Ecobuild. We know the event is synonymous with the very best in renewable technology and the timing and scale of the show makes it the perfect place for a launch. The new range offers high quality products, service and excellent value."

Size matters: Zenex Solar returns to Ecobuild with a vision to become the UK's biggest renewables distributor

Zenex Solar expects 2013 to be the biggest year yet for heating engineers looking to benefit from renewable technologies. It adds that with Green Deal, the RHI and the continuing rising cost of heating homes and businesses around the UK, there is no better time for installers to look to diversify.

S3020

Branching out

Secon Solar has exhibited at every Ecobuild show since it started but, in 2013, is set to exhibit the widest range of products it has ever shown.

The company's core range is solar thermal products featuring RESOL solar controllers, PAW pump stations and Solarmetalflex pipes, suitable for domestic and commercial projects.

According to Secon, a lot of installers have realised that they get better value and better quality by buying from a specialist distributor such as the Sunderland-based company.

Following development in the renewables market, it now supplies Italian-made Cordivari tanks and stores up to 10,000L.

Secon reports that Sontex RHI approved meters have sold well since the commercial RHI scheme was launched and these will be on the stand for visitors to see.

Smart technology: New for 2013 are Cordivari buffer tanks, available from Secon Solar

Air source heat pump products will be exhibited for the first time by Secon which despite not having room to display a biomass boiler, will be able to advise visitors about Viessmann biomass. **N1615**

Safety first

Fronius is back at Ecobuild to exhibit its latest inverter product – the Fronius Galvo.

The company says this flexible string, single-phase, electrically isolated inverter ensures the highest levels of safety. The device is for use in private households and small PV systems and was designed to make installation, operation and maintenance as simple as possible.

Fronius adds that its wide MPP voltage range allows for a simple system layout, and the high frequency transformer makes it compatible with all module technologies. It is also designed to be open for third party system monitoring.

The mix of materials is said to provide the best possible prerequisites for lifelong functionality and a safe, user-friendly product. The stylistic elements and discrete colour scheme turn the Fronius Galvo into a real eye-catcher whilst its design also incorporates an innovative hinged system making installation child's play.

Also showcasing at Ecobuild this year is Fronius' latest commercial sized inverter, the Agilo. According to Fronius, this new central inverter is the first in its power category that can be completely installed and maintained by the installer. This three-phase device is designed for industrial or commercial PV systems.

The Milton Keynes-based company offers a range of services to customers from sales and technical support through to product servicing, training and repairs. It adds that outstanding products and services, such as the IG Plus series of inverters and the Fronius Service Partner programme, make Fronius Solar Electronics quality leaders in the global market. **S2511**

Staying flexible: Fronius's new Galvo inverter is one of the products on show at Ecobuild

Joining forces

Intaeco is teaming up with manufacturer Mut Meccanica to deliver an expanded range of traditional and solar heating products at this year's Ecobuild.

Teamwork: Intaeco has linked up with Mut Meccanica to expand its range of heating products including recirculation units

The host of new products includes a variety of advanced manual and motorised shunt and mixing valves, motorised ball valves, electric servo controllers, flow and pressure switches, heat exchangers as well as many other new and classic HVAC components.

Stuart Gizzi, director at Intaeco, said: "We absolutely insist on providing quality, innovative and long-lasting products to our customers and aim to offer the most extensive heating and plumbing ranges possible.

"Our collaboration with Mut Meccanica signals our commitment to being the go-to manufacturer for all things HVAC. With over 40 years' experience supplying reliable, high-performing products to the market, a partnership with Mut was a no-brainer and further cements our position as a leading player on the heating landscape."

N2510

On the money

4Eco is heading to Ecobuild proud to present the immerSUN water heating system.

Developed for both commercial and domestic installations, 4Eco says the immerSUN has been specifically designed with ease of installation, cost savings and efficient energy management in mind.

It adds that once installed, the energy controller will reduce an average household's energy bill by around £250 per year, by diverting electricity generated by PV panels directly to an immersion heater, storage heater, or electric underfloor heating.

"Most people think that simply by having solar PV fitted they will see their electricity bills fall," said Jodi Huggett, business development director at 4Eco. "However, this isn't necessarily the case as only 25 percent of power generated from PV is typically consumed within the house.

"The immerSUN is the most easy to install and cost effective system on the market, helping users to minimise utility bills and cut PV payback time," added Huggett.

S2102

Partner organisation MCS presents its regular column for REI

Changes afoot

Decc recently implemented a number of changes following the consultation on Phase 2B of the Feed-in Tariffs Comprehensive Review: Tariffs for Non-PV Technologies and Scheme Administration Issues.

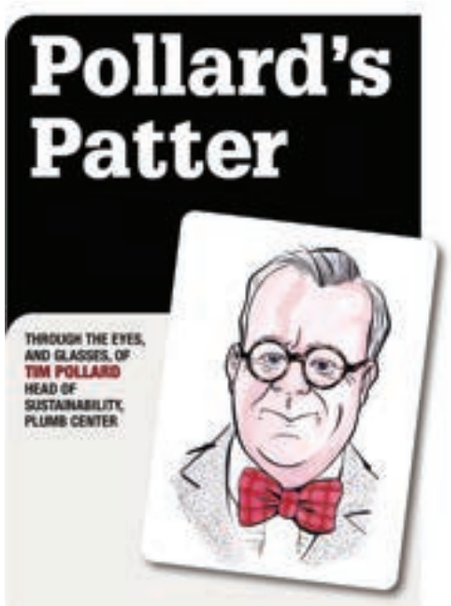
New measures have been introduced that will help community energy installations and school installations. From 1 December 2012 it was no longer be a requirement for community and school projects to meet a level D on the EPC. This means that any valid non-domestic EPC with any rating (G or above) will meet the new EPC requirements. Extensions to existing installations, even if they are solar PV community energy or school installations, will still be required to meet the existing EPC level D or above in order to receive the higher tariff.

A further benefit for community and school installations comes in the form of preliminary accreditation. This will apply to community and school installations with a declared net capacity over 50kW. In certain circumstances it may provide a tariff guarantee for a set validity period and also confirm eligibility before the installation has been commissioned. Extensions to existing installations, even if they are solar PV community energy or school installations, will still be required to meet the existing EPC level D or above in order to receive the higher tariff.

Preliminary accreditation is available for all PV and wind installations with a declared net capacity over 50kW, and all anaerobic digestion and hydro installations. An application for preliminary accreditation must be accompanied by a number of documents or evidence:

- Planning permission;
- Grid connection agreement;
- Relevant licensing and consents (hydro only).

Each of these documents must be dated on or before the application for preliminary accreditation is submitted. It is possible to apply for preliminary accreditation more than once if the installation is not commissioned within the first validity period.



With the government's RHI consultation concluded, I am asked if I think the incentives offered will be enough to stimulate the market. We will only know once the scheme has started. I know many in the industry feel some of the technologies have been harshly treated, but I urge caution when jumping to conclusions.

There are certainly some good things in the consultation paper. I am encouraged by the inclusion of hybrid systems, albeit with metering. I am also delighted to see the large piece about the 'customer journey.' This is a refreshing change to previous efforts, and acknowledges the importance of many of the practical aspects that the industry has been shouting about for ages.

I also sense that officials delivering the scheme are keen to listen and evaluate ideas. There has been an effort to engage with the industry at events around the UK over the last two months.

I am not overlooking some of the challenges in the proposal. One thing is certain: we cannot tolerate any further delays to a scheme already behind schedule. Will 'new build' and social housing be included? Will there be a different incentive for solar thermal to recognise the financial imbalance? Will heat output be deemed, and how will that be calculated? Will the administration of the scheme be manageable for the whole supply chain?

TECH TALKING

Breaking the ice

Bob Long is an engineer with heat pump specialists Eco Innovate. This is the first of a series of articles in which Bob discusses problems often encountered when installing this technology and ways to resolve them

Whilst I am a firm believer in the potential economics of heat pumps, I am concerned by the number of calls for assistance we received from heat pump installers during the freezing temperatures experienced at the beginning of December 2012.

The main issue raised was in some way expected as defrost water from an air source heat pump accumulates on the ground below, and sometimes even builds up inside the heat pump casing itself.

The commercial refrigeration industry has always needed to combat problems associated with defrost water drainage. In a freezer-room, a defrost water drip-tray would be fitted with trace heaters to ensure water could not freeze on contact. The drip tray would also be fitted with a single dedicated water drainage point, feeding into plumbed pipe work, again equipped with a trace heater tape and covered with heavy thermal insulation.

None of the air source heat pumps we have examined possess any form of tray heat at all, and drip-trays often have multiple drain holes, making a single dedicated drain off point impossible.

When defrost water cannot easily drain from the drip-tray, each subsequent defrost cycle progressively makes the situation worse.

Excessive ice build-up eventually leads to failure of the heat pump

When ice build-up commences, the situation can quickly accelerate with each defrost until excessive ice build-up eventually encroaches into the path of the fan, and leads to failure of the heat pump.

What's the solution?

Make sure that defrost water can leave the heat pump effectively by ensuring the heat pump is elevated above ground level by at least 300mm, and a trace heater is fitted to the drip-tray.

Trace heaters can be purchased from various sources and should be installed only by qualified personnel.

Heaters chosen should be low on energy requirement, and therefore need to be insulated on the external surface of the drip tray to ensure that heat is not lost to the atmosphere.

Trace heaters should only be energised when absolutely necessary i.e. when sub-zero temperatures prevail.

Manufacturers need to be consulted to ensure any alterations or additions do not invalidate the heat pump guarantee.

Cold calling: Many installers report the problem of defrost water freezing below or within heat pump casings during sub-zero temperatures

Bivalent energy

As outdoor temperatures plummet, so does the output of the heat pump, and of course, the all-important COP.

Recently, the Department of Energy and Climate Change legislated for the use of bivalent energy. In short, the heat pump must singularly deliver the total heat requirement for a given property, in ambient temperatures down to approximately -3°C.

The problem is that the energy deficit, created by fluctuating ambient conditions, is difficult to quantify and equally difficult to supplement with any degree of accuracy.

Accurate measurement and proportional control of bivalent energy is the only way to ensure heating demand is met

To maintain the highest COP possible, the energy deficit cannot be over-catered as this would waste energy, and if under-catered, will result in a cold customer.

Currently, many manufacturers of heat pumps incorporate a "climatic compensation heater" embedded within the heat pump unit.

This is NOT the ideal location to add bivalent energy, and can adversely impact on the heat pump's running economics.

Accurate measurement and proportional control of bivalent energy is the only way to ensure the heating demand is met, but above all, that energy is not being wasted and the COP is not being compromised by over-compensation.

I will discuss how to accomplish these both economically and effectively next month.

Good times ahead

Phil Hurley, managing director, NIBE, is looking forward to the year ahead for the heat pump market

While 2012 proved to be a year of uncertainty for heat pumps, at NIBE we look forward to the coming months and a strong 2013. In the face of a somewhat unpredictable outlook for wider legislative support – such as the future framework of the Renewable Heat Incentive (RHI) – this technology continues to operate successfully in both domestic and commercial applications across the UK, and we are confident in its abilities going forward.

Consultations into positive proposals for the RHI have now taken place – including the possibility of subsidies for air to water and ground source heat pumps. However, whilst these proposals represent a welcome turn in fortunes for the technology, the outcome of the consultations ultimately remains unknown – and this support is vital if we're to stimulate the necessary uptake of heat pumps this year. Not only would it help drive growth in the renewables market, it would mark long-overdue recognition of heat pumps and the significant role they are set to play in achieving strict carbon reduction targets.

At NIBE, we believe cementing the importance of MCS is central to the success of heat pump installations in the year ahead and beyond

Confirmation that heat pumps will be well represented in future RHI subsidies would also help drive a more consistent high skill level and standard of technology across the industry. Under the new proposals, to be eligible for payments, heat pumps and the installers who fit them must be officially accredited under the Microgeneration Certification Scheme (MCS).

At NIBE, we believe cementing the importance of MCS is central to the success of heat pump installations in the year ahead and beyond. In fact, we are calling for accreditation to become a legal requirement for all installers working with the technology. This would help ensure the right standards of quality are being upheld across the industry, by manufacturers and installers alike. Introducing a mandatory quality assurance scheme is the way to promote the higher levels of expertise, reliability, performance and safety needed to build confidence in heat pumps and their capabilities in the years to come.

Strength in numbers: Phil Hurley, NIBE, feels 2103 should be a strong year for heat pumps

While 2012 proved to be a year of uncertainty for heat pumps, at NIBE we look forward to the coming months and a strong 2013

"The alleged poor efficiency of micro-inverters is one of the prejudices they still have to refute, Dr Marco Torva, Power-One" P25

Talking Ten to the Dozen

Leading renewable experts reveal their opinions

What did you take away from the Business Strategy Conference: A Profitable Future in Renewables hosted by REI at The British Library last November?

Cathy Debenham, YouGen

"I came away from the Business Strategy Conference with some interesting insights into what really drives consumers when it's time to part with their cash. I'm fascinated to see whether the ESCO model for the commercial RHI grows in the way predicted and will be watching to see whether the traditional heating trade embrace the Green Deal."

Erich Scherer, BDO LLP

"Many conferences try to cover all audiences including academia, NGOs, business and public sector. The REI conference has focused clearly on what's relevant for on-site renewables businesses, including policy knowhow and business strategies and opportunities."

Ian Stares, PTS

"This year's conference included senior figures from government who are forming policy as well as Industry professionals who understand the market needs. Only proper joined up collaboration between government and industry will deliver the required results and the Renewable Energy Installer conference is in a good position to provide a platform for this to happen."

Andy Buchan, Future Renewable Energy

"What a great event the Business Strategy Conference turned out to be. It was time well spent being inside the British Museum all day listening to a group of people who were well versed in their chosen subjects. I left there with a real sense of achievement that I had learned so much in one day."

Steve Griffiths, Tritec Energy

"The conference answered a few questions about the Green Deal but I don't think the Green Deal will have a direct impact on solar PV. It confirmed to me that we manufacturers, have to drive the market and challenge energy change both domestically and commercially. Jonathan Porritt gave a powerful final key note speech."

Lu Rahman, Renewable Energy Installer

"The quality of both speakers and presentations was high and unrivalled by any other conference programme in the marketplace. We had experts such as Howard Johns, Ian Stares and Erich Scherer, offering incisive comment and advice on how the industry needs to proceed."

Garry Broadbent, heat pump specialist

"We have to be careful that events, exhibitions and conferences do not cover old ground providing no real benefit to the attendee. However, the recent REI conference provided a fresh slant on available information such as the interesting feedback provided on the market survey of end users carried out by Delta Energy & Environment."

Paul Nightingale, Enphase

"Being at the forefront of solar efficiency, it is important for Enphase to contribute to the solar industry. We were delighted to be asked to present on training, a subject that is close to our hearts. The passion and commitment of speakers, such as Jonathon Porritt, was highly engaging."

Amanda Hobbins, EnergyMyWay

"The balance of speakers meant that representatives from all areas of the industry had a voice. It was fascinating to hear the consumer research from Delta Energy & Environment. It's all too easy to lose sight of the consumer at the heart of our business. An excellent conference, congratulations REI."

Andy Boroughs, Organic Energy

"The title "A Profitable Future" struck a cord with me as I have always known that for renewables to become main stream rather than "alternative energy" – it must stand up commercially. Jonathan Porritt also gave an impassioned talk about our climate future."

A bright idea

In his regular column, Steve Pester asks, so what's this new National Solar Centre?

Given the rapid expansion of the market brought about by the initial feed-in tariff rates, it's no surprise that the quality of PV installations out there is pretty variable. In the non-domestic sector, there are not even any quality standards in place (above 50kW). However, the situation is still evolving and, we think, by and large, improving.

Glowing report: Steve Pester, BRE, says the BRE National Solar Centre, will help raise standards.

A key initiative to help raise standards and drive down costs is the setting up of the BRE National Solar Centre (NSC) – a joint initiative by BRE and Cornwall Council, launched by energy minister Greg Barker in London on 16 Jan, and due to open its doors in April this year. The NSC is to be a centre of solar excellence, based in Cornwall but acting nationally, providing trusted and independent information for the solar and construction industries and other interested parties. Its remit is to conduct research, analysis, testing, due diligence for projects and training, thereby assisting the uptake of solar energy in the UK. It will focus initially on solar PV.

One of the NSC's first jobs will be to write a code of practice for larger PV installations, in conjunction with some of the centre's supporters. Another of its functions is to collect data from PV installations across the UK and to analyse this to produce reliable performance figures, coupled with location and installation details, in order to inform industry and investors.

The NSC is to be a centre of solar excellence,, based in Cornwall but acting nationally

With the feed-in tariff rates now reduced to a sustainable level, factors of innovation, quality, longevity of systems, training and due diligence are beginning again to be seen as more significant than the race for fast profits.

The NSC will be funded partly by the European Regional Development Fund, but also needs match funding from interested parties in order to be effective at supporting the UK industry. Further details on the NSC can be found at **www.bre.co.uk/nsc.**

Q&A

Chris Davis

Dimplex

Q: What have you got planned for the rest of the year?
The RHPP Social Landlords and RHPP Communities streams seem to have really ignited the domestic renewable heat sector, especially for heat pumps, so we are working closely with a number of client projects. We're also gearing up for some exciting new product launches for the first half of this year.

Q: What do you see as the growth areas in renewables?
2013 is going to be a watershed year for renewable heat, especially with the planned launch of the domestic Renewable Heat Incentive (RHI). The proposals under the current consultation need some refinement to turn them into a workable solution, but domestic air source heat pumps look set to be a key growth area.

Q: How is your company cutting its carbon footprint?
One of most significant investments in recent years has been in localised manufacturing. Increasingly our renewables products are UK sourced, most notably air and ground source heat pumps and related hot water cylinders. This has a huge CO2 saving in terms of product miles, especially important as these areas of the market begin to grow.

Chris Davis is business development director at Dimplex

Talking point

Liz MacFarlane, Zenex Solar, looks ahead to the company's new showings at Ecobuild and new reasons for the sector to push the positive aspects of PV

I may be a Yorkshire lass, but I always welcome a trip to London, for Ecobuild 2013. It's the first major event of the year for us, as I guess it is for many other renewables companies. It may be smaller than recent years but the quality remains strong with key companies either exhibiting or visiting. It is, as always, the highlight of the UK renewable exhibition scene and with over 80 categories of exhibitor, the event continues to promise extensive expertise.

Of course, Zenex will be among the many companies showcasing its latest products and services. In fact, we will be launching a new range of heating products including a new heat pump and solar thermal panel. As with all our products, quality and reliability are at the heart of this new range and we have used our longstanding expertise in the industry to ensure our new products give both installers and end-users the very best of technology and longevity.

Talk time: Liz MacFarlane shares her industry knowledge with REI

Maybe not this year, but it looks like it won't be long before we'll be making the trip to Ecobuild in electric cars. With reports in The Guardian that sales of these vehicles look set to double in 2013 as prices start to fall, the future looks increasingly profitable for this sector. And of course, this will have a positive knock-on effect for our industry as the savvy and clued-up customer looks for ways to shave pounds off their energy bills as well as their petrol bills. It goes without saying that solar PV provides the perfect opportunity for homeowners to generate their own electricity. In the US, electric vehicles have grown in popularity and what happens to our cousins across the pond usually comes to affect us in the UK too, providing further reason to push the benefit of PV to an increased customer base.

Two minutes with . . .

Who are you?
Steve Griffiths, sales and marketing director for **Tritec Energy**

What do you do?
Tritec Energy is a leading supplier of all components of solar photovoltaic systems.

Where are you?
Our UK base is in Hampshire, and we recently moved to a new site in Eastleigh, which has given us double the office space and triple the warehouse space. We also have offices in more than twelve countries.

How's business at the moment?
Even though we're not seeing the heavy demands of last year, we're keeping up a reasonable level of business. We've recently partnered with a local haulage company, to make sure we can rapidly deliver customer orders, and we've invested in a dedicated training suite at our Eastleigh site.

We've also seen an encouraging level of demand in some of our recent product launches – particularly the Tri-Cell storage system for solar power and Tri-Roof mounting system.

How could it be better?
A more consistent month-on-month turnover with some predictability would be nice!

Who do you admire in renewables?
Those that look to drive the market through these tough times. This is definitely an industry where innovation is key, and I'm always impressed by those that are on the lookout for what's next in terms of technology.

What's the best business advice you have received?
Keep an eye on your competitors, but always concentrate on your own business first.

How are you going green?
As a company, we recycle our packaging materials. At home, I have a PV system on the roof of my house and, as a family, we recycle at least 70 per cent of our rubbish.

Knowledge: Case studies

PV AND AIR SOURCE HEAT PUMP

What: Energy efficiency at a historic Dorset farmhouse

How: Using solar photovoltaic panels and an air source heat pump

Result: £1,164 annual saving for the next 25 years

Skilful installation of technology by an electrical contractor means that a unique stone farmhouse in Dorset is more energy efficient and saves the owners money – while retaining the beauty of the property.

A local electrical contractor Wessex Renewable Energy visited the property to advise the owners. Thanks to a south-facing roof, they recommended installing a 2.76kWp turn-key PV system. This system would fit onto an extension building at the farmhouse, so would not detract too much from its beauty. Crucially, the system would generate a good percentage of energy towards the running of the new air source heat pump unit, also installed as part of the works by Wessex.

Thomas Mortimer, general manager at Wessex Renewable Energy, oversaw the installation. He commented: "This farmhouse was a very exciting project for us, as it allowed us to think creatively about how to minimise the energy use within the property. By coupling a PV system with an air source heat pump, the client's fuel bills were dramatically reduced compared to the original night storage heaters."

Thanks to the PV installation, when Feed-in Tariff payments and the energy savings are combined, the owners are now at least £1,164 a year better off for the next 25 years.

Unique saving: This Dorset farmhouse has slashed bills by £1164.

Paul Reeve, head of environment at the ECA, estimated that this investment in PV will pay for itself in less than a decade, and then generate a return for the rest of the Feed-in Tariff period and beyond. He said: "This project is a fantastic example of how renewable energy can offer strong, financial benefits over a prolonged period of time, even to those with the most unusual and beautiful properties."

The owners are delighted that they have been able to make savings and reduce their carbon footprint, whilst maintaining their home's unique appearance.

HEAT PUMPS

What: The UK's largest retrofit heat pump programme

How: 200 GSHP installs in Somerset sheltered housing

Result: Significant reduction in energy bills for elderly residents

Ground force: Heat pumps located in grey enclosures provide year round heat to the elderly residents at Yarlington, Somerset

WIND, SOLAR THERMAL, HEAT PUMPS, SOLAR PV

What: The UK's first zero-energy cost business park

How: Using a combination of a wind turbine, solar thermal, solar PV and heat pumps

Result: Energy Performance Certificate rating A+ and no energy costs for tenants

A government minister has praised the launch of a business park in Wigan, for being one of the first in the UK to boast zero energy costs.

Baroness Hanham, parliamentary under secretary of state for communities and minister responsible for the European Regional Development Fund, opened the £2.7million development, describing it as "exciting and innovative".

He added: "Armstrong Point harnesses one very important priority, carbon emissions, while tackling another by supporting local businesses."

A range of renewable energy technologies was installed for the site, including 90kWp Hyundai PV array, a Kingspan 6kW wind turbine, nine solar thermal hot water systems and nine heat pumps.

The first tenants have already moved into the development on the old Britvic site in Hindley Green, which offers nine high spec business units. It has been estimated that they will save an average of £2 per sq ft on rent because they will not have to pay any energy costs.

Dave Armstrong, whose company Armstrong Properties is behind the development, said: "We are delighted by the level of interest our development has generated to date. Our park offers the latest renewable energy technologies to tenants and is the first zero-energy cost business park in the UK."

Forget bills: Ian Moore, Kingspan, David Hunt, Eco Environments, and Dave Armstrong, Armstrong properties at the launch of the UK's first zero-energy business park

The director at Eco Environments, said: "We worked closely with Armstrong Properties and Kingspan to ensure not only that the scheme was able to make use of the very best renewable energy technologies but also that it was delivered on time and to budget."

The park will create up to 65 new jobs on top of the 55 construction jobs while the site was being developed, providing a much needed boost to the Wigan economy.

All of the business units will have an Energy Performance Certificate rating of A+ as well as being only one of a handful of developments in the world to boast a BREEAM (BRE Environmental Assessment Method) Outstanding rating.

Kensa Heat Pumps has reported the completion of a large heat pump retrofit programme by Yarlington Housing Group in Somerset. 200 homes were fitted with GSHPs supplied by Kensa in time for Christmas benefitting vulnerable and elderly residents with constant green energy and reduced bills.

The Christmas presents to residents were made possible following Yarlington Housing Group's successful bid for RHPP funding, supplemented by Kensa's partnership with Scottish and Southern Energy.

Kensa modified the heat pumps to feature easy-to-use controls and the appliances were placed outside in custom made enclosures to maximise space in the houses.

Residents Mr and Mrs Coombe said: "Everything went so smoothly, the workmen were wonderful and we are so pleased with our new ground source heat pump and radiators.

Everything went so smoothly, the workmen were wonderful and we are so pleased with our new ground source heat pump

"We were concerned with the upheaval and the new technology but after living with the system now over this cold spell we have heat and hot water when we want, the hot water temperature and pressure is lovely, and we have never run out, even after a long hot bubble bath. We would advise everyone to fit a Kensa heat pump."

Paul Dennison, Kensa's project director, added: "We are delighted to have assembled the necessary financial support to allow Yarlington Housing Group to embark on this major programme. In addition to responding to the pleas of their tenants to provide lower cost heating, each heat pump will contribute a significant environmental benefit, reducing carbon emissions by around 60 per cent."

Figure it out

Generation tariffs for non PV technologies

Technology	Band (kW)	Final tariffs (p/kWh)	Community energy tariff
Hydro	≤15	21.0	21.0
	>15-≤100	19.6	19.6
	>100-≤500	15.5	15.5
	>500-≤2000	12.1	12.1
	>2000-≤5000	4.48	4.48
Wind	≤1.5	21.0	21.0
	>1.5-≤15	21.0	21.0
	>15-≤100	21.0	21.0
	>100-≤500	17.5	17.5
	>500-≤1500	9.5	9.5
	>1500-≤5000	4.48	4.48

(Source: DECC)

Number of MCS registered installations per technology

Technology type	Cumulative number	Installed Dec12
Solar PV	395817	5066
Biomass	1898	65
Air source heat pump	10553	388
Ground source heat pump	3660	99
Solar thermal	3581	67
Small Wind	3788	18
Total	429376	5805

Number of MCS registered installers per technology

Technology type	Cumulative number	Registered Dec12
Solar PV	4031	23
Biomass	237	1
Air source heat pump	876	5
Ground source heat pump	742	5
Solar thermal	1217	9
Small Wind	143	1
Total	4703	47

(Figures supplied by Gemserv)

Generation tariffs for Solar PV

Tariff band	FiT rate (p/kWh)
<4kW	15.44
>4-10kW	13.99
>10-50kW	13.03
>50-100kW	11.5
>100-150kW	11.5
>150-250kW	11.0
>250kW-5MW	7.1
Standalone	7.1
Export Tariff	4.5

Proposed tariff ranges for the domestic RHI

Technology	Proposed tariff rate (p/kWh)
ASHP	6.9-11.5
Biomass boilers	5.2-8.7
GSHP	12.5-17.3
Solar thermal	17.3

Domestic RHI is expected to be introduced in summer 2013 and will apply to all eligible installations installed since July 2009

RHPP grants

All houses

Solar thermal – £300 – cash voucher valid for three months

Houses not heated by gas from the grid

Biomass boiler – £950 – valid for six months
Air source heat pump – £850 – valid for five months
Ground source or water source heat pump – £1250 – valid for six months
(Source: Energy Saving Trust)
Eligibility criteria can be found online by visiting: **http://bit.ly/RENUVD**
No voucher is valid beyond March 31 2013

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	0.65 per litre	2530 litres	£1,644
Wood pellets	4800 per tonne	94	24300	298 per tonne	5 tonnes	£1,490
Natural gas	1 per kWh	90	25300	0.049 per kWh	25300 kWh	£1,240
LPG	6.6 per litre	90	25300	0.49 per litre	3833 litres	£1,878
Electricity	1 per kWh	100	23000	0.149 per kWh	23000 kWh	£3,427
*Air source heat pump	1 per kWh	290	7931	0.149 per kWh	7931kWh	£1,182
*Ground source heat pump	1 per kWh	360	6389	0.149 per kWh	6389kWh	£952
Dual mode system 1						
Oil boiler (30% of heat load)	10 per litre	90	7590	0.65 per litre	759 litres	£493
*Air source heat pump (70% of heat load)	1 per kWh	290	5552	0.149 per kWh	5552 kWh	£827
Dual mode system 2						
Gas boiler (30% of heat load)	1 per kWh	90	7590	0.049 per kWh	7590 kWh	£372
*Air source heat pump (70% of heat load)	1 per kWh	290	5552	0.149 per kWh	5552 kWh	£827

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

RHI non-domestic rates

Tariff name	Eligible technology	Eligible sizes	Tariff rate (pence/kWh)	Tariff duration
Small biomass	Solid biomass: Municipal solid waste (inc CHP)	Less than 200 kWth	Tier 1: 8.3 Tier 2: 2.1	20
Medium biomass	Solid biomass: Municipal solid waste (inc CHP)	200 kWth and above, less than 100 kWth	Tier 1: 5.1 Tier 2: 2.1	20
Large biomass	Solid biomass: Municipal solid waste (inc CHP)	1000 kWth and above	1	20
Small ground source	Ground source heat pumps, water-source heat pumps, deep geothermal	Less than 100 kWth	4.7	20
Large ground source	Ground source heat pumps, water-source heat pumps, deep geothermal	100 kWth and above	3.4	20
Solar thermal	Solar thermal	Less than 200 kWth	8.9	20
Biomethane	Biomethane injection and biogas combustion, except from landfill	Biomethane all scales, biogas combustion less than 200 kWth	7.1	20

(Source: OFGEM)

Green Deal Cashback Scheme example rate

Energy Saving Measure	Cashback level
Loft insulation	£100
Cavity wall insulation	£250
Solid wall insulation	£650
Draught proofing	£50
Heating controls	£70
Condensing oil boiler	£310
Condensing gas boiler	£270
Double/triple glazing	£20 per m² (up to £320)

A full list and further details can be found online at: http://bit.ly/RKmr50

What data would you like to see on this page?

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Who: Howard Tribick, managing director of HT Energy

What: Founded in North Yorkshire 15 years ago, HT Energy now operate as NIBE VIP installers, working exclusively with NIBE heat pumps and other renewable technologies.

Money talks: Managing director Howard Tribick says most of HT Energy's business comes from word-of-mouth recommendations

Heat pumps at the heart of a hectic week

Monday
The week starts with a team meeting to discuss upcoming projects. First on the list is a 12kW ground source heat pump installation which will take around a week to complete, and it's important that every stage is pre-planned and carried out to MCS requirements. I've already met with the client for a full heat-loss calculation and site survey to determine the best size unit for the job and to discuss budgets.

Next we visit the site and mark out the area where the contractors will dig the trenches for the ground loops, as well as the utility room where the heat pump will be sited. Once everything is marked up, the contractors can start work and we can head off to collect all the materials we'll need to start fitting tomorrow.

Tuesday
Following a service visit to an air source heat pump installation nearby, I head back to check on the ground source project. The house is swapping over from an oil system, and we need to keep the heat on for as long as possible before commissioning the new heat pump. This means we concentrate on the internal connections between new compotents like the buffer tank, hot water cylinder and the heat pump itself before everything is plumbed in. The rest of the day is taken up with making up the joints and fitting the valves so we're ready to start on the pipework tomorrow.

Wednesday
It's back to the ground source site today, where the trenches are ready for the first loop. Whilst the contractors are busy digging the second trench, the next step is a full clean of the existing heating system before the pipework is connected up.

While this is underway, I travel to the NIBE headquarters in Chesterfield for an introduction to a new ground source heat pump model. As NIBE VIP installers, training is at the top of our priority list and keeping up to date with product developments.

Thursday
Today we're running the final air and water tests on the ground source pipework before the electrician comes to wire the system up to the mains. Outside, the final loop has also gone in, so it's time to feed the pipes from the manifold through to the heat pump inside. Whilst the team is drilling the holes and fitting the ducting, I head next door to meet with a potential customer. Most of our business comes from word-of-mouth recommendations from satisfied customers, and it's not unusual for neighbours to get in touch following an installation nearby.

Friday
Following the final testing and commissioning of the ground source system, I sit down with the homeowners to give them a full briefing on their new heat pump. For the technology to deliver the best results, it's essential that the customer is fully informed on how to use it properly and comfortable with the system and its controls.

The rest of the day is taken up with the post-installation paperwork back at the office. Completing the Benchmark certificate is a condition of NIBE's warranty, and as VIP installers we can offer an extended warranty of five years.

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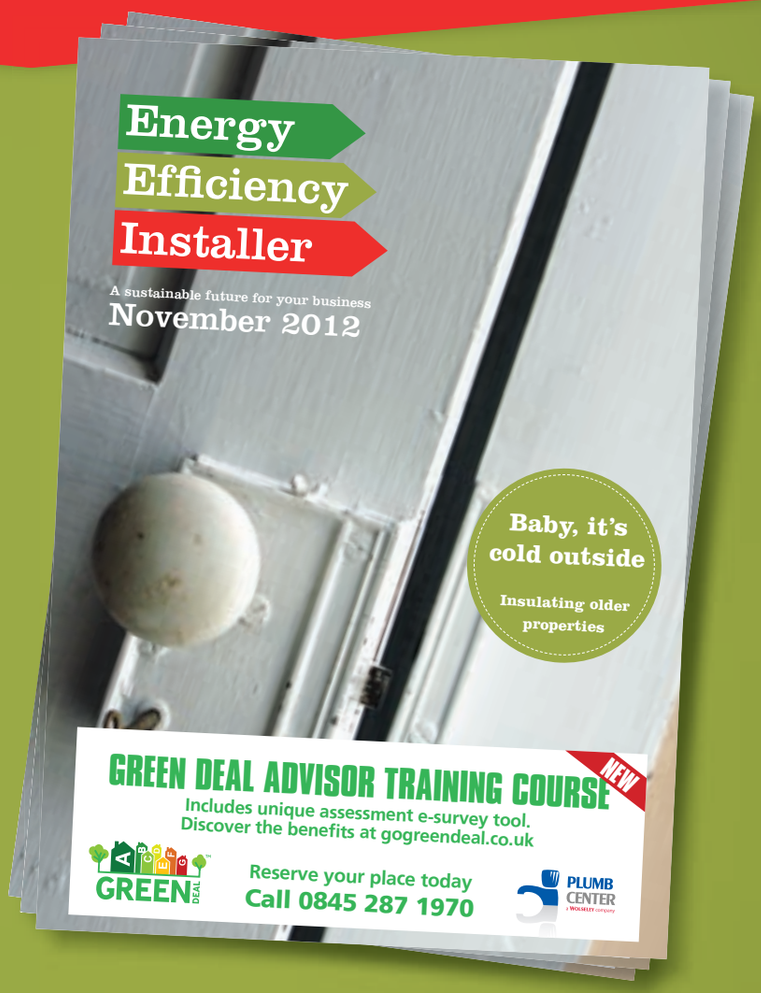

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