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The Great Gig in the Sky

The clocks have gone back and the central heating is now back on with a vengeance, but I remain preoccupied with the sun's warming rays for the moment following the regenerative experience of Solar Energy UK last month (full review on p10).

I, like many other visitors I suspect, had long feared that the unwelcome decision to remove RO support for large scale solar from next April would cast a long shadow over proceedings at the NEC. It was a tonic therefore to hear no talk of a last hurrah for the sector, or Dad's Army-esque shouts of 'don't panic!' as the enormous growth of ground mounted solar begins to look elsewhere for a new source of sustenance.

The new regime of Contract for Difference is little understood, and the official advice seems to be to 'see what happens', but the sentiment of almost everyone I spoke with on the showfloor is that the next chapter for solar farms will be met with intrigue rather than fear, and engagement not despair.

The challenge that now faces our intrepid solar developers of going head-to-head alongside other technologies to auction for financial support is a reflection of the sector's newfound standing. No longer undergoing its examinations, the whole supply chain has emerged into a grown up and egalitarian world where it is well qualified to succeed, and be judged on merit alone.

Encouragingly, any slackening in the deployment of solar farms looks set to be largely mitigated by the government's desire to grow the commercial rooftop sector. Readers from the PV sector should take heart from DECC's intention to split the FiT band above 250kW in order to protect roof top installations from degression caused by ground mounted arrays, and potentially allow the transfer of FiT installations from one building to another, thus tackling a considerable barrier to companies which lease their premises.

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'The UK's stable investment climate makes the UK a booming solar market " Evangelos Angelopoulos, ET Solar p10

Events

The Green Building Roadshow ecoSHOWCASE
04 Nov 2015 Hampden Park, Glasgow
20 Nov 2015 Emirates Stadium, London
02 Dec 2015 UWE, Bristol
10 Feb 2015 Salford City Stadium
http://www.ecoshowcase.co.uk/register/

Futurebuild
05-06 Nov Sheffield City Hall
www.futurebuild.eu

NICEIC/ELECSA Live North
27 Nov Aintree Racecourse, Liverpool
http://www.niceic-elecsalive.com/

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

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

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

Heating & Renewables Roadshow: Floorplan filling up fast

Time is running out to book your stand at next year's **Heating & Renewables Roadshow** with over 70 percent of the floor plan already reserved

Since its launch in July, many of the industry's biggest names have confirmed their support including Travis Perkins, St Gobain, Viessmann, Vaillant, REHAU, Plumbase, Windhager and Hitachi.

What's more, early bird discounts are only available for another few weeks until December 01 2014.

Demand from exhibitors for the only regional industry event has been so strong that the floorplan has had to be enlarged to provide extra capacity.

Therefore, to avoid disappointment, we strongly urge you contact us soon too ensure your participation at this award-winning exhibition series.

To discuss rates or for more information, please contact
Adam Hart
adam@andpublishing.co.uk
T: 07785 630380
or Jonathan Hibbert
jonathan@andpublishing.co.uk
T: 01565 626760

NAPIT welcomes new phase of GDHIF funding

NAPIT has welcomed the announcement from DECC that a further £100m of funding is set to be invested in the Green Deal Home Improvement Fund (GDHIF).

The announcement was made by Ed Davey that a second round of funding for the voucher scheme is due to be made available later this month. It follows the sudden temporary closure of the initiative in July, after DECC's £120m initial budget was exhausted in a matter of weeks.

Commenting on the announcement, managing director of NAPIT Certification David Cowburn, said: "NAPIT welcome the announcement of fresh funding for the voucher scheme. The GDHIF proved a very popular initiative in its first phase and we are optimistic about its potential to generate demand in the energy saving market. However, we urge DECC to learn lessons and to ensure better management of supply and demand this time around.

"Both installers and their customers require certainty if they are to invest in energy saving measures and this means Government need to ensure the provision of sustainable solutions to incentivise uptake and tackle climate change."

The GDHIF Fund is set to be open to applications from households before the end of November. Further details including terms and conditions, rates and all measures to be covered will also be announced in November.

Plumb and Parts Center report RHI seminar success

Road trip: Plumb Center toured 13 locations in the UK to explain the virtues of the RHI to both installers already involved in the scheme and those on the periphery

This year, Plumb and Parts Center has been running a series of seminars around the UK in order to broaden understanding of the Renewable Heat Incentive scheme.

The events were for installers that have already embraced renewable technologies as well as those looking to get started. They had a detailed analysis of the eligibility for the scheme, as well as presentations from some of the major players in the industry.

The Seminars ran at thirteen different locations around the UK and a number of them included an overview by a representative from the Department of Energy & Climate Change (DECC), explaining the options and the opportunities for the industry.

Sales and events manager, Kate Gilbert spoke about the training and certification routes run in association with partners Sevenoaks Energy Academy and Easy MCS, and the routes to becoming qualified MCS installers.

Staff from biomass technology suppliers Trianco or Grant were also on hand to explain the benefits of biomass heating systems, as well as the pay back opportunities that the installer's clients can get from having one of their systems installed under the RHI.

Plumb and Parts Center's head of sustainability, Tim Pollard who made presentations on the business opportunities that have been made available by the RHI, said: "More people are thinking about their impact on the environment these days, and many are looking for low impact replacements for their gas and electric systems.

"These seminars have been a great success, and we feel that installers who attended are really starting to get to grips with the benefits and changes that the RHI will bring. We're really excited about the potential renewable technologies have and are looking forward to seeing what the future has to offer."

You can find uploads of the presentations at **www.wolseleysbc.co.uk/news-and-events/events/2013/dec/RHISeminars2014/**

REA and STA to go separate ways

The Renewable Energy Association and Solar Trade Association are to end their formal affiliation on 1 January 2015

The two associations became affiliated in March 2011, when the STA merged with the REA's Solar Power Group and relaunched with representation of both the solar heating and solar power industries.

REA chairman Martin Wright said: "Solar heating and solar power are vitally important technologies, with the potential to reduce energy costs for UK households and businesses. Our members want us to strengthen our offer for these important technologies. This is what we're going to do, by building on the excellent capacity in our existing On-site and Renewable Power sector groups. We will continue to apply our unparalleled policy expertise and strong relations with government to the goal of securing a bright future for UK solar energy.

"I'm very proud of the achievements we have secured together these past three and a half years and very grateful to the STA staff and membership for their vital work. I wish the STA every success for the future."

STA chairman Jan Sisson said: "The Solar Trade Association and the Renewable Energy Association have been key to these achievements, which were unimaginable when we first started working together nearly four years ago. Solar has come of age and has become a significant presence in the UK renewables market. As this market has expanded, so too must the STA to meet the new challenges ahead. It is vital that solar energy strengthens its voice, particularly with an eye on the increasingly competitive post-subsidy world.

"I would like to thank everyone at the Renewable Energy Association for its valued contribution in supporting the STA to become the highly professional, respected and influential voice of solar that it is today."

New headquarters for HETAS

HETAS has moved to new offices in Tewkesbury, Gloucestershire.

The organisation which specialises in solid fuel and biomass had been based near Cheltenham since 2007. HETAS provides a wide range of services for the solid fuel, biomass and renewable energy sector including product approvals, training, assessment and registration for installers, and also operates product and installer approvals for the Microgeneration Certification Scheme.

The new address is HETAS, Severn House, Unit 5, Newtown Trading Estate, Green Lane, Tewkesbury, Gloucestershire, GL20 8HD. The telephone number has also changed to 01684 278170 although the old number will still operate for a short time.

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Ian Draisey,
Managing Director BayWa r.e. Solar Systems Ltd

Parc y Scarlets Rugby Stadium, Llanelli

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Pre-fab biomass surge fuelled by tariff increase

The latest increase in the RHI tariff from one to two p/kWh for commercial biomass boilers exceeding 1 MW is expected to lead to a rise in the demand for prefabricated biomass energy centres, argues **Peter Lester**, product manager at Econergy

The new higher RHI tariff, introduced in May 2014 offers a significant financial incentive, and the implications can already be seen, with plans underway for larger-scale projects - both retrofit and new-build - throughout the UK.

Highly suitable for schools, commercial properties and rural estates, these heat systems are also being used in large district heating schemes and affordable housing projects where keeping down the cost of fuel and reducing carbon emissions has become a top priority.

Econergy is currently installing new low-carbon biomass communal heating schemes for Solihull Community Housing (SCH), in West Midlands, in its 1960s high-rise social housing stock, under the British Gas ECO programme.

The project will use multiple 'Ecoblox' – Econergy's pre-fabricated biomass fuelled energy centres – to replace tenants' electric heating in a total of 1,156 flats and is expected to save approximately 100,000 tonnes of carbon over their lifetime.

Ecoblox 'plug and play' solutions are purpose-built, stand-alone structures that house a wood chip or pellet fuelled Austrian-manufactured biomass boiler from Fröling, as the fuel store, controls, plumbing and electrics, chimney, lighting and ventilation.

Off-site construction allows for fast and simple site installations, as prefabricated elements can be broken down for transport and rapidly assembled in position on site.

Sky's the limit: Demand for pre-fab biomass energy centres has been fuelled by the increase to the >1MW RHI tariff

The centre can be positioned away from the main building, which can be an advantage from both a practical and aesthetic perspective.

The benefits of using Ecoblox include very little disruption during the installation phase, with no loss of heat for tenants during the works, or tenants having to move out.

BPEC Charity Life Award presents £35,000

£35,000 has been given in charitable donations by training and certification provider, **BPEC**, to projects that use plumbing skills to enhance the lives others less fortunate either here in the UK or abroad

At its third Life Award presentation ceremony held at Derby County Football Club on Friday 10 October, The BPEC Charity made three major awards to deserving projects.

The BPEC Charity Life Award 2014 was presented to Dean Buchanan from Datum Foundation, the project he is involved in aims to assist the development of a new secondary school being built in Malawi. Dean received an initial award of £10,357 from The BPEC Charity, along with pledges of further support for the next three years.

The BPEC Charity also awarded £10,600 to the Peace and Hope Trust (PHT). Support from the Life Award will help build and equip a vocational centre in Nicaragua with an emphasis on teaching basic plumbing skills.

£13,500 was presented to Jeffrey Cohen from Water Works. Water Works is a grassroots charity committed to supporting rural Malawian communities gain access to safe drinking water and hygienic sanitation facilities.

Winning entry: L-R Mark Antrobus (BPEC Trustee – Life Award Panel member), George Thomson (BPEC Trustee – Life Award Panel member), Dean Buchanan (Datum Foundation – Life Award winner), Elsa Buchanan (Datum Foundation – Life Award winner), Watson Carlill (BPEC Trustee – Life Award Panel member)

BPEC chairman Frank Glover said: "2014 has been a brilliant Life Award; the panel of Trustees has been truly inspired by the submissions that have been received this year.

"The Life Award continues to have an inspirational effect on everyone connected with the projects and is changing perspectives and attitudes in a really positive way. The experience the Plumbers gain by being involved in the projects is immeasurable and helps to develop their skills to operate in today's competitive marketplace".

The closing date for applications for the 2015 BPEC Life Award is 30 June 2015. To find out more about submitting entries to any of the awards please visit **www.bpec.org.uk/the-bpec-charity/**

Eliminating the fire risks of rooftop PV

Following national newspaper reports of a rooftop fire at a primary school in Nottinghamshire, **Jim Wallace** of Seaward Solar looks at the fire safety implications of rooftop installed PV systems

The blaze at Sutton Bonington Primary School was reported to be the third such incident of its type involving PV panels installed as part of British Gas's Generation Green project, which gives schools free equipment in return for a government green subsidy payment.

Although these incidents are comparatively rare in relation to the number of solar PV installations now in place, these are not the first rooftop fires to be linked with solar PV installations in the UK.

At present there is no reason to believe that the fire risks associated with PV are greater than those associated with any other electrical equipment, but all these situations highlight the importance of ensuring the safety and quality of all PV installations and reinforce the need for effective electrical testing.

Setting the standards for safety

The international standard, 'IEC 62446: 2009 Grid connected PV systems – minimum requirements for system documentation, commissioning tests, and inspection', specifies the minimum requirements for PV system documentation, commissioning tests and inspections.

Essentially the standard recognises that the provision of appropriate documentation can help to ensure the long term performance and safety of a PV system be assured.

IEC 62446 does this by setting out the information and documentation that should be provided to the customer following the installation of a solar PV panel system and also the initial (and periodic) electrical inspection and testing required.

In short the standard sets out measures to ensure that:

- The PV panels and electrical supply connections have been wired up correctly
- That the electrical insulation is good
- The protective earth connection is as it should be
- There has been no damage to cables during installation

Safety first: Well publicised rooftop fires on school buildings have highlighted the importance of electrical safety in PV installations

In the UK the MCS has adopted the principles of IEC 62446 as the basis for its testing and documentation regime. As a result, the fundamentals of the standard are effectively enforced because no Feed-in Tariff will be paid unless the installation has been installed by an MCS accredited installer.

It is interesting to note that the emphasis is on documentation, and this is in effect the evidence used to demonstrate that appropriate precautions and tests were undertaken prior to the handing over of a PV system to the property owner.

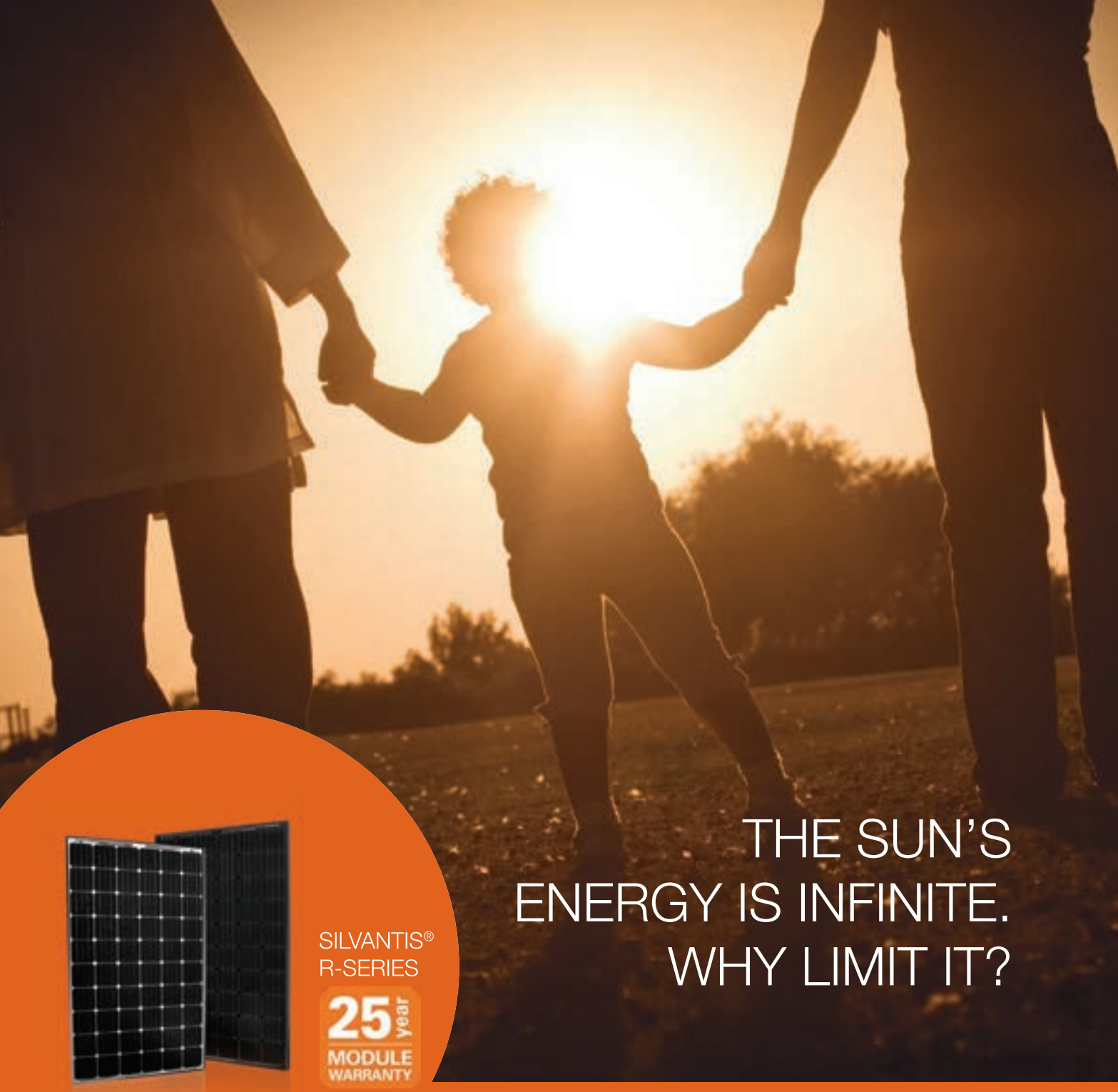
Such information not only provides evidence to the consumer that work has been performed correctly, but it also acts as a check list to an installer and ensures that best practice is followed with the work that is being undertaken.

The absolute minimum testing that needs to be undertaken involves earth continuity measurements (where applicable), open circuit voltage, polarity, short circuit current, insulation and irradiance.

To meet the electrical test needs some contractors have used multiple instruments that typically include an earth continuity and insulation resistance tester, a multimeter, DC clamp meter along with various associated connectors and leads to apply a short circuit to the system under test.

However, the danger with such 'homemade kits' is that they may pose a risk of harm to the user, not all of the tests required by IEC 62446 will be covered and, with different PV system electrical tests potentially requiring the use of different testers, using such an array of instruments can be cumbersome and time consuming.

In response dedicated 'all in one' solar PV test kits have been introduced that enable measurements to be taken in a fast, safe and efficient fashion.



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SEUK review

From October 14-16, over 4,000 visitors descended on Birmingham's NEC for the fifth annual **Solar Energy UK exhibition**. REI spoke to a number of exhibitors to get a flavour of the show and to feel the pulse of the UK solar sector

Evangelos Angelopoulos, global procurement director, ET Solar

This show is small and concentrated but has more visitors per hall than at Intersolar. The UK market is certainly the leading market in Europe, and our number one market in terms of focus. In 2015 we will be creating a UK-based project development team and aim to install over 70MW of capacity in the EPC market before the end of March.

The UK's stable investment climate makes the UK a booming solar market, even if the weather isn't the best!

Andrew Lee, european sales director, Sharp Energy Solutions

This show has grown year on year and is a great platform for us coming six months after Ecobuild. It's also great to be in the Midlands.

We have come here to launch our new battery storage products, and the feedback has been excellent. Self-consumption is emerging as the next logical step in the solar journey.

Olivier Jacques, managing director EMEA, Enphase

There are more visitors in 2014 compared to last time and the UK will certainly be the biggest country for solar in Europe this year.

With reductions to subsidies coming soon, we think it is important to see how the UK is going to transition to self-consumption. Enphase helps offset what might be lost in tariffs by increasing production typically by 15 percent.

Microinverters' increase in residential market share is now over 12 percent, but could be up to 50 percent in 18 months.

Daniel Roca, senior business developer, Panasonic

We have been focused on the UK market since the introduction of the Feed-in Tariff and were the first company with an installer network – which now stands at over 250.

Every single installer I have spoken to here has been tremendously positive about our new virtual solar platform. The independent feedback offered by embracing social media is a valuable selling tool.

Whilst the residential segment is very strong in the UK, we see massive commercial potential as businesses see the value of self consumption and understand that ROI is a combination of savings and incentives.

Ben Robinson, business development manager, BayWa r.e

This is most definitely the busiest show we've had – I've had no time for lunch! It's good to see the market picking up, especially commercial installers who are stepping up to the challenge.

Enquiries for our partner programme have been very strong, and the push to install before the RO closure on April 01 2015 has seen interest in BayWa r.e increase rapidly due to our reputation to deliver.

Richard Rushin, UK sales manager, Trina Solar

It's been a good year at SEUK and the quality of leads has been very high. Many of the conversations we've had with installers have leant towards self-consumption, the increasing use of smart technology, and opening up smaller roofs.

Last year, Trina was the number one brand of module manufacturer in the UK. We are strongly committed to Europe and the UK and are the only Chinese manufacturer with this level of staffing and presence on the continent.

In 2015, we will continue to run our installer training sessions. Not all modules are created equally so we like to engage with installers so they can see our USPs. The installer is looking for increasing efficiency, a warranty that can be honoured and design support, and we tick all those boxes.

Solar Power Portal winners announced

Solar Power Portal has announced the winners of its annual awards, held on Tuesday 14 October at the Hilton Metropole Birmingham Hotel, NEC

Over 500 professionals from the solar industry attended the ceremony, hosted by Kate Humble, writer and TV presenter, to celebrate this year's leading solar organisations.
The winners were as follows:

Public space installation
Winner: Middlesex University Hospital, Spirit Solar

Top table: Diners enjoy the spectacle of The Solar Power Portal Awards at the Hilton Metropole Birmingham Hotel

Most successful integrated renewables system
Winner: The Solar House, Newform Energy
Highly commended: Sheeplands Farm, The Greener Group

Renewable heat installation
Winner: Bradfield college art wing, Spirit Solar

Commercial rooftop installation
Winner: Kingspan Insulation Selby, Kingspan Energy
Highly commended: Lakeside Energy from Waste, BELECTRIC UK

Community installation
Winner: Coalfields Community Sustainable Energy Programme

Ground mount solar site (<10MW)
Winner: Ketton cement works, Lark Energy
Highly commended: Baglan Bay, St Modwen Plc and Eco Energy Power Solutions
Highly commended: Willersey Solar Farm, BELECTRIC UK

Utility-scale solar farm (>10MW)
Winner: Lackford Estate Solar Park, Low Carbon
Highly commended: Ermine Street Solar Farm, Lightsource Renewable Energy

Domestic rooftop installation
Winner: Croyde Cottage, Solarsense UK
Highly commended: My Eco Home, IRFTS

Communications campaign
Winner: Solar Independence Day, The Solar Trade Association

Project finance innovation
Winner: Lightsource Renewable Energy
Highly commended: Liddeston Ridge PV array, Port of Milford Haven

Installer of the year
Winner: SunGift Solar
Highly commended: EvoEnergy

Rexel Foundation Prize
Winner: Energise Sussex Coast

The Solar Power Portal outstanding achievement award
Winner: Ray Noble, Solar Consultant

DECC's 'ambition has expanded', says new minister

New climate change minister **Amber Rudd**'s address at Solar Energy UK has raised questions over DECC's level of ambition for the role of solar in the UK

In her speech, Rudd said that DECC remained ambitious to achieve 10-12GW of installed capacity by 2020, leaving some visitors baffled following earlier pledges to hit the 20GW mark by the end of the decade.

Solarcentury's head of public affairs, Seb Berry, told online resource edieEnergy: "In the space of two years, the government's 'ambition' for solar has dropped from 22GW by 2020, to 20GW 'within a decade', to 'possibly more than 12 GW by 2020'.

"This is a surprising rowing back on ministerial ambition, given the Solar Trade Association's realistic push for solar PV to be 'subsidy-free' by the end of the next parliament."

Rudd, who replaced Greg Barker in July, also stressed the need for solar to be cost-effective in her defence of the controversial decision to scrap the RO scheme for developments over 5MW from next April.

She added that measures were being put in place to aid the transition to the new support mechanism of Contracts for Difference. Regarding qualification for the RO grace periods, the measures include:

Amber Rudd

- Dropping the financial requirement to have spent approximately 10 percent of the total cost
- Changing the land rights condition so that it can be satisfied by an option to lease
- Adjusting the planning requirement to have asked for planning permission to have been applied for, rather than received by 13 May.

In other updates, the FiT degression band above 250kW is to be split to protect rooftop installations from degression caused by ground mounted arrays, and a consultation will open on allowing FiT installations to be moved from one building to another.

Image credit: DECC

When green means power

REI gets to grips with **Hitachi Power Tools**' new 5.0Ah Lithium-ion battery technology

Getting in those hard to reach places can be tricky when installing renewable technologies, especially when wiring, fixing pipework or securing fittings. That is when cordless power tools really come into their own, especially if there is no onsite power source available for corded tools.

There is nothing more frustrating, however, when using cordless tools than when the battery life does not last long or does not provide enough power to get the job done.

Hitachi Power Tools says renewables installers can now benefit from its 18V 5.0Ah Lithium-ion (Li-ion) cordless range, which is more advanced than any of its predecessors.

"The range brings the latest brushless motor and advanced electronic control technology together with high performance Li-ion 5.0Ah batteries," said Simon Miller, brand manager. "This means up to 200 percent more run time per charge than 3.0Ah batteries while still keeping the same size and weight for the tools."

Hitachi also says its brushless motor technology performs 150 percent more efficiently compared to their conventional brushed motors.

"Brushless motors generate less heat," continued Simon. "This improves dust proofing, which is important for installers as it gives the power tools a longer service life, saving you time and money.

"Thanks to the way the battery has been designed to slide onto the tools, the cordless range has slim grip handles that provide even more control and ergonomic comfort for the user. The slide design ensures the tools are fully compatible with the entire Hitachi range of 18V slide Li-ion batteries."

Domestic RHI and metering

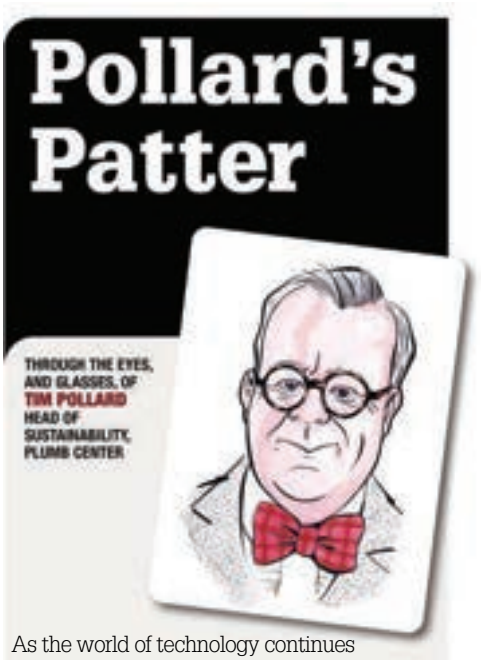
It has been a good year for the heat industry with the arrival of the much anticipated Domestic RHI. However, a topic which a lot of installers have been contacting us about is metering; When is metering needed? Who is allowed to install it? And where does it need to be installed?

When is metering needed?
The domestic RHI is based on the output from the renewable heat technology that has been installed; however, in certain cases a customer may wish to combine the technologies to heat their home. For example, they may have a biomass boiler working in conjunction with a gas boiler. Therefore a meter would be required to establish how much heat is being generated from the biomass boiler, as the payments would only be due on the renewable technology. It is important to remember that each installation irrespective of whether a meter is required should be made meter ready. More information on this can be found in the Domestic RHI Metering Guidance Document on the MCS website.

Who is allowed to install it?
MCS do not certify installers for metering and therefore many customers and installers have been confused about the statement: 'If you need metering equipment fitted after you installed, make sure your installer is MCS certified.' They are not referring to a specific 'meter' certified installer but what is intended by this is that the person capable of installing the meter must be certified by MCS in any of the applicable technologies.

Where does it need to be installed?
For those installations which require metering for payment, the location of the meter will be dependent on the design of the overall system. However, Appendix C of the Domestic RHI Metering Guidance Document provides working examples with the meter location illustrated.

https://www.ofgem.gov.uk/environmental-programmes/domestic-renewable-heat-incentive/about-domestic-rhi/metering/your-installer-and-metering-domestic-renewable-heat-incentive



As the world of technology continues to accelerate at pace we are constantly bombarded by new developments, even in terms of language. The latest concept to excite some people is the 'Smart' or 'Connected Home'.

We continue to fill our homes with more and more devices and yet our busy lives mean that we spend less and less time in the house. The ability to control devices remotely becomes more interesting especially when considering our energy-sensitive devices. One of the constant moans about PV is the inability to use our home-generated electricity during the day when our panels are most productive. We can fit time switches, but predicting the UK weather is not a reliable activity.

Heating controls is a particularly interesting issue since the evidence shows that massive savings can be made by installing and using them correctly.

Some of us have already received 'Smart Meters' from energy suppliers collecting more data and potentially providing more control. The issue before long may well be joining all these systems together on a common 'platform', rather than creating multiple networks which may even end up in conflict. However, there is a really poor record of standardisation even in relatively simple issues. A variety of connections at charge points for electric vehicles springs to mind.

One thing is clear. Many people really enjoy mobile applications and using their mobile devices in ever more ambitious ways and where there is demand then someone will grasp the opportunity.

CURRENT AFFAIRS

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

One piece of good news amongst all the recent gloom over PV and the Green Deal has been the recent announcement that accreditations under the Domestic RHI have reached the 10,000 mark on 29 September. Ofgem stated that they had paid out over £1m to successful applicants and there appear to be many more in the pipeline. They are expecting to pay over £120m for these successful applicants over the next seven years which really does give an incentive to look at the Domestic RHI for heating systems.

Interestingly the two areas which had the most installations were Scotland (expected) and South West England, one of the warmest parts of the country but ideal for solar thermal installations. The majority of accreditations were 'legacy', those systems installed between 15 July 2009 and 09 April 2014. This is to be expected given the different time scales for new and existing schemes. A high proportion of the legacy schemes were for air source heat pumps, followed by solar thermal. The majority (44 percent) of new installations were biomass systems, which have had tremendous publicity, so perhaps this is not a surprise. The next most popular technology was air source heat pumps at 31 percent. In both legacy and new installations ground source heat pumps were in the minority, 18 percent and 5 percent respectively.

Pictures at an exhibition

Steve Pester, BRE, reflects on the main themes to emerge from last month's Solar Energy UK show in Birmingham

This show just gets better each year. The Solar Power Portal awards were presented by Kate Humble, thus proving that the world of solar power is definitely a glamorous one these days!

A few things of note from the event:

The new IET *Code of Practice for Grid-connected Solar Photovoltaic (PV) Systems* (CoP for short!) was launched by a panel of the main brains behind the project. The guide is currently out for public consultation (until 07 Nov) and it is hoped that this document with help to significantly raise the bar on PV installation quality. Further details at: **www.theiet.org/solar-pv.**

Regarding MCS, there were some good presentations and lively discussions with MCS promising to improve some of the areas currently perceived as weak points, such as lack of random inspections, variations in quality of inspections across certification bodies, etc.

Energy storage was a strong theme, of course – everyone can see the advantages, but the cost of such systems, at least at the domestic scale, means that a subsidy is really needed to get the market started. The NSC is working with various bodies to help understand how best to integrate storage systems with renewables and the UK grid.

Of course, for the larger projects, the loss of ROCs for systems of greater than 5MW next year and the replacement scheme, Contracts for Difference (CfD), were the subject of much discussion, but a key point to emerge was that the UK is in a far better position than most of the rest of Europe in terms of market support mechanisms – we have FiTs, ROCs and now CfD, whereas many countries have little or no subsidy at all since revoking their FiT schemes. This is why the UK is now seen as the number one market within Europe.

Opinion

"The business case for thin film solar cells is strengthening rapidly" Sven Lindström, Midsummer p22

Two minutes with . . .

Who are you?
Stephen Knight, commercial director for Navitron

What do you do?
Established in 2004, Navitron is a leading manufacturer and supplier of a full range of renewable technologies.

Where are you?
Our office, factory and warehouses are situated in Oakham, nr Leicester, but our network of over 100 local installers operates throughout the UK.

How's business at the moment?
Great. With this being the first winter with the Domestic RHI in effect, more and more people seem to be taking up renewable heating to warm their homes.

How could business be better?
Early delays in the Domestic RHI's launch seem to have led some homeowners to lose confidence in or forget about renewable heating. In some cases, these consumers spent all of their savings set aside for renewables on PV panels to claim Feed-in Tariff income instead of waiting for the d-RHI to come into effect. Worryingly, at its current growth rate, the d-RHI looks like it could underperform by as much as six times the FIT numbers over the last four years.

What's the best business advice you've ever received?
The most valuable piece of advice I've ever heard, which I carry with me to this day and have helped make part of the Navitron company culture, is: "Make the most of all opportunities as they come along".

How are you going green?
Our Oakham warehouse is fitted with 740 solar PV panels, totaling 150kW, which have helped lower our carbon footprint significantly over the years.

Q&A

Andy Wallace

Consumer Credit Solutions

REI: What have you got planned for the next 12 months?
AW: Our priority is to get more funders interested in financing solar PV and renewables technology. We already have a panel of lenders that are very enthusiastic supporters and we have another lender that's about to participate in the market imminently. We also have a couple of negotiations underway that might result in further finance options for the solar sector, including the provision of second line lending aimed at underwriting consumers who may have failed finance through a primary lender.

What do you see as the growth area in renewables?
We've certainly seen continued growth in the domestic solar PV sector but we're a long way off market saturation, you only have to look around to realise most people still aren't utilising their roof space. In rural communities biomass is a definite growth area, particular since the RHI has come into play. A particular area of interest is the storage of energy generated via solar. I believe reliable, low maintenance battery storage that's competitively priced is something that would really engage a lot of people.

How is your company cutting its carbon footprint?
The CCS management team definitely 'walk the talk'. Myself, I've invested in solar panels, a ground source heat pump and rainwater harvesting at home. My business partner Peter Nicholson has recently bought a hybrid car which will cut emissions for business trips.

Andy Wallace is managing partner at Consumer Credit Solutions

TECH TALKING

Plummer or IT guru?

Heat pump expert **Bob Long** tackles unnecessary complexity in heat pumps and the systems in which they operate

This article is fuelled by the nightmare week I have had at the mercy of an electronics-control issue, and extremely poor support from the heat pump manufacturer.

Although the system under examination has more than its fair share of complexity, locating the problem was quite straight forward, as the fundamental fault lay with the DHW supply pump not running.

The symptom according to the fault code, read from the sophisticated controller, showed fault codes pertaining to: - 'high temp' trip, and 'high pressure' trip (refrigerant), which was to be expected with a non-functional water pump.

The resolve from here should have been quite simple. Ascertain why the circulating pump is not running, and by remedying this, the high temp and high pressure faults signals would go away.

These simple steps became more difficult with realisation of the DHW pump being variable speed, powered by an inverter and controlled by the main circuit board embedded within the heat pump cabinet.

Visual examination showed nothing obviously noticeable, such as a blown control fuse or similar, and while the machine was idle, a further fault code appeared. This time indicated a 'communication error from expansion module 3'!

So, we now know what the problem is, but fixing it has quickly become a completely different issue.

A call to the manufacturer's agent came up with nothing and a google search revealed that the 'expansion module' could not be configured without indexing the pass code for 'technician' into the main programmer control box. After indexing the pass code, the communication interface can be re-configured.

A simple task if you work for Bill Gates, and a classic case of 'each to their own', as even the all-powerful Mr Gates would probably struggle to solder a few plumbing pipe together.

One begins to wonder what on earth a plumber/heating system installer is actually expected to know, by delving into this level of electronic, computerised sophistication.

At this time of writing, I am still awaiting the manufacturer to respond with the elusive 'pass code', and my client is heating a £2m dwelling with electric heaters!

While we are trying to convince a sceptical audience on the merits of energy efficient heat pumps, the manufacturers seem to be completely disconnected from the problems we experience, and the merits of simplicity breeding reliability.

Much of the complexity is due to efforts made towards reduced power usage, and an industry that thinks computer electronics is the answer to everything.

Economics in all areas of energy usage have great merit, but when complexity overtakes reliability, it is time to take stock of where all this is leading.

Installers should be able to regard a heat pump as nothing more than heat source, powered by electricity, producing large quantities hot water, CHEAPLY!

If heat pump manufacturers succeed in this relatively simple task, there will a warm future for users and installers.

Being an engineer with many years of refrigeration system design experience to draw upon, I am surprised that heat pump manufacturers do not optimise the operational COP through basic refrigeration principals, ensuring good system efficiency.

Trying to optimise upon the relatively small energy consumption of ancillary equipment, such as pumps, fans is a very secondary consideration, and appears to be the source of much complexity.

Main power usage is consumed by driving the refrigeration compressor and in almost every heat pump examined, the potential operational COP could be significantly improved by manufacturers addressing simple design issues, improving performance and removing complexity.

Renewable energy policy and the ballot box

Gordon Moran, writing for the European Energy Centre (EEC), examines recent political party conference pledges ahead of the 2015 general election

The result of the UK general election in 2015 will be significant for microgeneration and depending upon which party or parties form the next government, large-scale policy changes are likely to highly affect the sector.

Naturally, the positions differ between the main political parties. The Labour Party is supportive of renewables and has ambitious targets aiming for the decarbonisation of the power sector by 2030. The Liberal Democrats are generally supportive of renewables and are much more likely to be forming policy after the election as part of a coalition rather than as a single party of government. In turn, the Conservatives have broadly agreed to maintain levels of support for renewables' subsidies from the previous government whilst in coalition, although this is uncertain if they win the next election outright. The least likely but most dramatic changes would result from smaller parties becoming part of a coalition government, such as the Green Party or UKIP.

A new UK government after the general election in 2015 may cause substantial revision of government policy and potentially more unexpected changes in regulation. Therefore it may well be most beneficial for the sector to focus on low risk, short term and simple funding options for microgeneration installations, to avoid the potential pitfalls of complex government schemes such as the Green Deal.

In spite of the changes that often come down the pipeline, the future seems to remain bright and real progress is being made in the UK to help households reduce their carbon emissions and tackle issues such as the cost of energy and security of supply.

To learn more about renewable energy and energy efficiency through training courses visit www.EUenergycentre.org
Reading this magazine counts towards EnergyCPD hours.

Top tips for van security

With tool theft on the rise, Trade Skills 4 U offers tips to installers on how to avoid theft from your van

Covering the basics

All seasoned sparkies will know to not leave their tools in the van overnight or, if this is unavoidable, parking with the doors against a wall in a well lit area.

Securing your van

Don't rely on the locks supplied as standard on your van. Some vans have locks fitted that thieves can open within 60 seconds using a cheap lock pick brought online.

Once your locks are up to the job, additional locks should be considered. Popular options include Slamlocks where the door automatically locks once closed, Slamplates which add additional protection over locks and deadlocks which add extra locking points.

Checking your van

This may seem obvious, but how many of us nowadays simply rely on the electronic transmissions given by the electronic key to lock the van. Thieves have developed technology to override these functions meaning that your van won't actually lock when you press the button.

There is an easy remedy to this however, and that is the old fashioned method of trying the handle to see if it's locked!

Ford Transits

Investing in your locks is particularly recommended as thieves in recent times have developed a tool that will unlock a Ford Transit without force in around 30 seconds.

With the Ford Transit being the most popular van on the road at the moment, it is not much of a surprise that thieves are targeting Transits specifically.

Prior preparation

It is worth remembering that most thieves are opportunist and are just looking for an easy way to steal. Making their job as hard as possible minimises your chances of being their next victim.

Doubling up: Installers should always back up the standard locks supplied on vans, advises Trade Skills 4 U

Talking point

Liz MacFarlane, looks back at an eventful SEUK 2014 for Zenex Solar

The pink shoes are packed away until Ecobuild 2015 and team Zenex is now just about recovered from the phenomena that was Solar Energy UK 2014.

Now in its fifth year, this exhibition was the best yet, with 2629 visitors on the second day alone, outnumbering a total footfall of 2,432 across the entire three days in 2013. Our own Zenex innovations such as the 700W Solis mini-inverter, the SolarEdge embedded JA Solar PV module, our Renusol East/West mounting system and the 50kW Delta inverter all attracted much attention.

We greeted customers and suppliers new and old to our stand and I didn't get much chance to escape, but when I did I was interested to find some great new products, developments in battery storage, plus new ways of working within the industry.

In particular, the Lightsource Installer Workshop grabbed my attention and attracted over 70 installers who were all keen to find out how they can work with the developer to bring dormant mid-scale commercial projects to fruition, supported by a simple and attractive PPA contract. There are some really innovative ideas out there to help the industry continue to flourish.

I was flattered to discover that I have a readership of more than ten, most of who share my opinions (Thank you for coming to say hello) and I also had the opportunity of meeting one of my fellow REI columnists Steve Pester, BRE, to hear about the good work at the National Solar Centre.

However, my lasting memory of SEUK 2014 will be of those who should probably remain nameless, wearing silly German hats, sharing best practise over a stein or two of ale in a muddy field courtesy of the SolarEdge Oktoberfest. If you were there you'll know exactly what I'm saying and you'll probably share my hope that all photographic evidence has been destroyed.

Increasing demand for the RHI

Robert Burke, HETAS, analyses the latest release of RHI statistics

Every month I sit down to write this column and find myself drawn back to the same subject – the Renewable Heat Incentive (RHI). But it's an unavoidable fact that the RHI is dominating and driving the renewables industry forwards. By the end of September the government was able to announce that 10,000 RHI applications had been accredited, with a commitment to pay £120m to those first 10,000 accreditations over the next seven years.

Biomass is the most popular type of renewable technology being installed under new applications

Oil remains the most common fuel which is being replaced by renewable technologies, which points to the fact that customers in rural off-grid areas are benefitting from the scheme the most. Geographically the South West of England and Scotland are the two regions with the highest number of accreditations compared to the number of households. Biomass is the most popular type of renewable technology being installed under new applications, making up 44 percent of accreditations. It also accounts for 17 percent of legacy applications which include almost five years of historic installations.

With the increasing amount of new applications, more companies are taking advantage of the opportunities to increase installation work by becoming registered with the MCS. Greenables, based in Halstead in Essex, is one company who recently became a HETAS registered MCS installer. Feedback from Greenables and other MCS installers indicates that consumer awareness of RHI is still relatively low, and customers are looking for reassurance that both the technologies and RHI payments will remain in place for the long term. Although installation costs for renewable heat systems can be a barrier, this can be overcome once RHI is explained to customers.

Becoming an MCS approved installer isn't just for larger installation companies. Many smaller firms and sole traders are finding the payback and investment in training worthwhile in terms of increased business. Oliver Carter Plumbing & Heating, a sole trader based in North Yorkshire, recently decided to apply for MCS accreditation with HETAS following several customer enquiries regarding biomass boiler installations. HETAS was able to advise on the relevant qualifications and put Oliver in touch with a local HETAS approved training centre. Following the training course there were a number of assignments to complete prior to assessment by a HETAS auditor. The process was relatively straightforward with guidance provided along the way, culminating in MCS accreditation for Oliver.

Greenables and Oliver Carter are just two of the many installers and companies who are investing in MCS to gain the benefits of RHI not just for themselves, but also for their customers. If the RHI continues grow then there will be continuing demand for MCS accredited installers, with existing biomass, gas and oil installers well placed to take advantage of the additional business opportunities.

Customers are looking for reassurance that both the technologies and RHI payments will remain in place for the long term

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Through the looking glass

Sven Lindström, Midsummer ceo, presents his vision for an urban future dominated by BIPV

More than half of the planet's population live in urban regions today. This will grow to 75 per cent in the next 30 to 35 years. That would mean seven billion people living in more or less congested areas, all needing shelter, food – and lots of energy.

There is a growing consensus that the mega cities in the future cannot rely entirely on energy produced far away. Besides supply constraints, there are energy losses in the transport of the electricity, logistical nightmares, security issues and of course environmental concerns.

The distributed energy discussion has so far mainly centred on local smaller power plants and smart grids. That is good. But we must also talk about the potential for local production of renewable energy by the end users on a micro scale.

The electricity produced by 'roof solar energy' could be used for heating, cooling, running office machinery or even fed back to the grid, earning the building owners money.

What I call 'roof energy' is of course building-integrated photovoltaics (BIPV), one of the fastest growing segments of the photovoltaic industry.

Traditional wafer-based silicon solar cells are efficient but rigid, thick and heavy, ideal for large solar parks in sparsely populated areas but not in dense cities. They are too heavy for most roofs. However, thin films solar cells made out of a copper-indium-gallium-selenium metal alloy (CIGS) are thin, light and flexible. They can be made frameless and can be bent and are ideal for buildings and other structures that are uneven, moving or weak.

The business case for thin film solar cells is strengthening rapidly since they are becoming increasingly efficient.

An office, school, storage facility or factory with a flat rood in a Mediterranean country like Italy could annually yield 1,250 kWh from every kW installed, at a production cost of 5.6 euro cents (7.2 US cents). The production cost would decrease if the roof is slanted, by up to 20 per cent for an optimal 35 degree angle. The production cost would obviously be higher in colder countries and lower in countries nearer the equator. But even in Sweden the production cost could be as low as 8 cents.

Suppliers can offer a discounted roofing price in combination with a stable and independent supply of electricity

A production cost of 5 to 10 cents is well below the current – not to mention the expected future – electricity prices in Europe.

Unchartered territory: Merging the global roofing material market with PV technology opens up tremendous new business opportunities, says Midsummer's Sven Lindström

So there is already a business case for thin film solar cells on roofs, either retrofitted or new construction. The payoff time is five years for a building in Rome, nine years in Munich, 14 years in Paris and 19 years in Stockholm – well below the 25+ year lifespan of the panels.

Here is an excellent opportunity for architects, roofing material suppliers and construction companies to take a leading position in what is destined to be the material of choice for urban planners in the future.

Selling roofing solutions and electricity together opens up to completely new business models: suppliers can offer a discounted roofing price in combination with a stable and independent supply of electricity. Customers can secure electricity price – and get a new roof.

Municipalities and city planners in today's and tomorrow's mega cities will make efforts to make their cities greener and more sustainable. Building owners will like the prospect of lower energy costs.

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Second coming

The benefits of solar PV can be greatly enhanced if installed alongside voltage optimisation, a proven technology that delivers additional advantages to both installers and their customers. **Mick Greensmith**, national sales manager VO4 explains

Homeowners and businesses have long enjoyed the economic benefits of solar PV installation through their reduced reliance on the national grid and revenue from the Feed-in Tariff. But it is when combined with voltage optimisation technology that the full advantages can potentially be realised.

Installers of solar PV are ideally placed to offer this complementary service to customers, as voltage optimisation installation requires no additional training. They already possess the necessary skills to install systems, which makes it a quick and easy way to boost the 'bottom line', whilst offering the end-user a superior service.

Voltage optimisation reduces energy consumption by addressing the imbalance between the voltage supplied through the National Grid, often as high as 242V in the UK, and the 220V required by electrical appliances. The surplus energy, which is still factored into electricity bills, often manifests itself as heat and vibration and can place an unnecessary strain on appliances, in turn shortening lifespan and increasing maintenance and replacement costs. Voltage optimisation systems smooth out the peaks and troughs inherent in the power supply and can go some way to helping protect appliances against potentially damaging transients.

When combined with solar PV, voltage optimisation systems can also help address the additional challenges posed by a solar PV system, namely the need for the solar PV inverter to step up the voltage to above the existing mains voltage, enabling electricity generated to be fed back into the grid. This can mean that electrical appliances are subjected to a higher voltage than the original mains voltage and can sometimes reduce the savings initially created by the solar PV units.

Twice as nice: Voltage optimisation unleashes the full economic potential of solar PV, but also offers a seamless way for installers to increase their margins, says VO4's Mick Greensmith

Solar PV installers have an excellent opportunity to offer an enhanced service to their customers by installing both systems together. Customers will be able to enjoy a greater reduction in energy consumption, in the knowledge that carbon emissions have also been reduced.

The environmental benefit may also be considerable, as for every kilowatt hour of electricity generated around 1lb of carbon is consumed. It is estimated that householders could save approximately 330-500lbs of CO2 emissions a year.

A reduction in energy costs means that payback periods are reduced and customers get an improved return on investment. The energy savings can be made across entire homes and businesses without having to make compromises to every day life or working practices, as they do not require any changes in behaviour.

Larger commercial businesses have enjoyed the benefits of voltage optimisation technology for some time, but smaller business owners and large householders now have an opportunity to tap into the savings available.

British company VO4 has developed a new 100Amp 3-phase voltage optimisation unit primarily aimed at SMEs, GP practices, dentists, pubs, restaurants, convenience stores and larger private homes with annual electricity bills of up to £30,000.

A reduction in energy costs means that PV payback periods are reduced and customers get an improved return on investment

Two become one

Anna Wakefield, marketing manager for Grant UK, looks at an installation featuring two Grant Spira condensing wood pellet boilers, providing energy efficiency and savings to an off-gas homeowner

There is no doubt that reducing the cost of home heating is high on the agenda for many off-gas households, and biomass boilers are a realistic and attractive proposition, particularly where older fossil-fuelled appliances are being replaced.

The Grant Spira is a condensing wood pellet boiler, which is available in single unit with outputs of 6 to 26kW and 9 to 36kW.

The range combines easy installation with straightforward daily operation and low maintenance and utilises Grant's exclusive turbulator baffle system which provides a highly efficient, convenient and environmentally friendly way of heating a property.

Installations up to 72kW can also be accommodated by utilising two boilers (separately flued) with a central hopper/twin auger arrangement. Using two boilers to achieve higher outputs is very cost effective.

When the boilers are combined, their precise electronic burner controls allow both units to modulate as one, down to just 25 percent of maximum load when the full output is not required. This, along with the extremely high efficiencies achieved, makes the Spira a unique option when considering a biomass boiler.

They come complete with a pellet hopper and feed auger, which automatically supplies the Spira with fuel. Grant also manufactures wood pellet stores in various sizes from 500kg to 6 tonnes, for greater fuel capacity, as buying pellets in bulk often works out to be less expensive than in bags.

Leighton's, a successful heating, plumbing and renewable installation company based in Hull recently completed a project utilising two Spira boilers in series.

The customer was originally heating the home with two older inefficient oil-fired boilers, which were consuming a large amount of fuel. The aim of the installation was to save energy, reduce fuel costs and access the RHI.

It is at present the only MCS registered condensing self-cleaning pellet boiler on the market with a 97 percent SAP2005 seasonal efficiency

Leighton's chose the Spira because of its high efficiency - it is at present the only MCS registered condensing self-cleaning pellet boiler on the market with a 97 percent SAP2005 seasonal efficiency. This also means the products are eligible for the domestic and commercial RHI.

First choice: The Grant Spira condensing wood pellet boiler was chosen by Hull-based installer Leighton's due to its impressive efficiency

"We installed a combined boiler plant room and six tonne pellet storage modular building at the rear of the property," said Mike Leighton.

"We utilised 90m of underground distribution piping to connect with the property heating system. Two 36kW Grant Spira's were installed in series to provide heating for the property and swimming pool.

"The controls were updated to include a three zone heating circuit with fully modulating PAW pump sets and a NEST thermostat, allowing the customer to control the heating system by his mobile phone or tablet remotely when away from the property."

The installation shows just how versatile the technology within Grant Spira wood pellet boilers actually is and Leighton's believes the payback for the project will be just four years.

Grant UK supports renewable heating installers with its own Accredited Installer Scheme, called G-One, as well as free of charge product courses at our Training Academies in Devizes and Hawes. We've also just launched a new biomass technical forum – **www.grantbiomassforum.com** where installers can find answers to technical queries and additionally have discussions with other installers about the technology.

We offer support for homeowners as well. Our new 'Living with Biomass' guide explains how the technology works and how the customer should look after the appliance, allowing homeowners to make an informed choice when purchasing a wood pellet boiler. The easy-to-follow document can be downloaded from our website.

The state of play

Ben Whittle, technical sales manager at Energy Innovations, plots a profitable way forward for installers in a rapidly maturing biomass marketplace

The biomass industry has seen some huge changes since the introduction of the RHI. What had previously been a relatively small industry has seen a huge uplift in turnover, with new and existing businesses eager to get in on the action – just as we saw with the introduction of the Feed-in Tariff. So how can we see the market progressing, and where does the future lie for biomass?

The commercial market looks set broadly to continue growing, tempered by planned steady reductions in the commercial RHI tariff. There has been a marked rise in applications in the last two months, but the degression mechanism has been clearly stated and is well understood by the industry, so shouldn't produce too many nasty surprises.

The domestic market tariffs are very enticing. However, the most common barriers for the domestic customer are capital cost and space. For these reasons, the main activity has centred on boiler replacements in medium to large country houses and farms, where space is at less of a premium and upfront investment is more justifiable. This is likely to result in a profitable income stream moving forward, given that the majority of larger houses are unsuited to heat pumps and oil and LPG prices are only set to rise.

So, what considerations should be made by those professionals or new collectives entering the biomass market?

Space race

Installing a biomass system is very different from installing an oil or gas boiler. First, biomass requires significantly more space, which can be an obstacle for some clients. Installations therefore often require a more innovative approach than is called for by gas and oil boiler systems. In addition there are many more variables to consider when installing a successful system, from fuel storage and delivery, to plant layout and, crucially, flue design. All of this can make for a more challenging, but ultimately more rewarding, sector.

Moving forward

The key to success in this industry is finding good quality equipment and a supplier partner who understands your needs – and has time to deal with them. To stand out, you need to demonstrate a high level of technical competence and reliability in your product choices. Make sure you find a supplier that has a strong technical grounding, UK-based parts support and a lot of experience to support you and your installations.

Repeat business

The next stage is to offer your clients a complete package. Many renewable energy businesses see servicing and maintenance as a hurdle. Research has shown however that customers want to talk about this at the point of sale, though this is rarely brought up by the supplier. In reality this requirement is a gift; having a solid, experienced service and maintenance offering to back up your installation will help you maintain a relationship with your clients, which in turn provides ongoing, reliable business regardless of market changes. In addition, it helps keep your name fresh in your clients' minds when they need new work done or are making recommendations to friends.

Energy Innovations and our network of local partners have been installing Gilles boilers for the past ten years. We ensure that our distribution partners work to the highest standards, offering them a high level support package with the benefit of our accumulated experience, system design skills and, most importantly, detailed technical knowledge of the product.

Complete service: The key to succeeding in an increasingly competitive biomass market is using high quality equipment from a reputable supplier, says Energy Innovations' Ben Whittle

Square peg in a round hole

Ben White, R&D engineer at Fair Energy, explains how an innovation in buffer tank design has reduced the footprint of containerised energy plants

A containerised biomass energy plant is often a more convenient way of making the switch to a renewable heating system.

'Plug and play' technology creates little in the way of disruption to a customer's property: energy plants are constructed off-site and delivered as a finished product. The main source of potential disruption on-site is the laying of a concrete base.

Design brief

As with any heating system, it's not just the boiler type that determines overall efficiency: a poorly designed system with all of its ancillary components - even when coupled-up to the best boiler money can buy - will only limit energy generation.

This was the case with a new client's existing containerised plant.

The buffer tank was discovered to be too small for the total energy plant, but was the only size that would fit inside the container once the boiler, expansion tank, fuel store and mains pipes had been fitted, with the result that the biomass installation was running inefficiently.

One possible alternative was to re-house the energy plant inside a larger container but this was quickly ruled out due to cost; the only other viable option was a space-saving rectangular buffer tank.

But how to build a rectangular buffer tank?

Design stage

Designing a buffer tank that contravened the tried-and-tested cylindrical shape with its predictable hoop stress was initially fraught with problems.

It is a known mechanical fact that a cylinder experiences an easily calculable stress when it experiences an internal pressure i.e. hoop stress. A rectangle or cuboid structure experiences very different mechanical loading when pressurised, and is inherently weaker when pressurised.

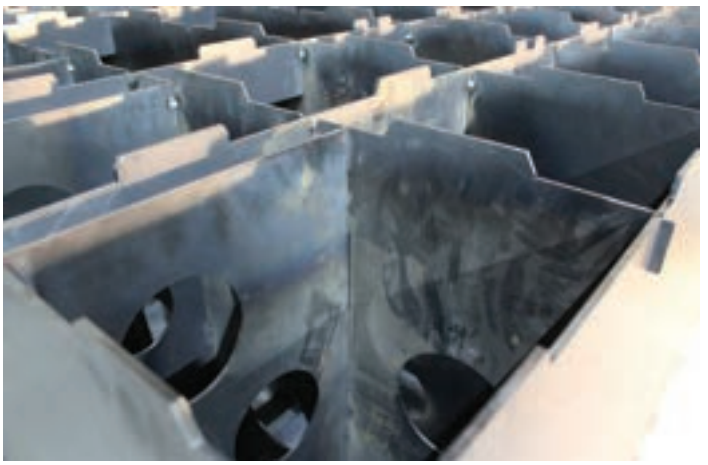
Therefore the greatest challenge designing a rectangular buffer centred on the need to overcome the problem of a more complicated stress model.

The solution involved incorporating multiple interconnected plates inside the rectangular buffer tank which are all placed under the same tension, evenly distributing the load to eliminate deformation.

This complex internal structure has the added benefit of reducing convection currents inside the tank, producing a well-stratified store with hot water always available at the top.

Testing

Computational analysis was conducted with encouraging results –the design concept quickly reached the production stage and Prototype I was ready for testing within eight working days. The 5000ltr tank was filled to capacity and the engineers waited for the results.



Space saving: Fair Energy's buffer tank design offers multiple benefits due to its unique rectangular shape, says R&D engineer Ben White

What happened next was unexpected.

The computational analysis had failed to reveal what the prototype actually demonstrated when put under test conditions – there was a totally unacceptable level of deformation and it was back to the technical drawing board.

Re-test

As well as using the test findings to recalibrate the computer modelling, a design modification was made to the buffer tank to strengthen the internal structure.

Building for success

Prototype II was then built and tested with the result that it deflected in accordance with the revised predictions, achieving a working pressure of 3bar with a high factor of safety – the industry standard that applies to all biomass installations.

Prototype II was also optimised to produce economies of scale for manufacturing: the laser-cut steel plates were designed in a sequence for delivery as a flat pack, enabling easier construction and saving almost a day's manufacturing time.

Adoption

The main benefits to customers of the rectangular buffer tank are two-fold: it provides the option to have a 30 foot container for 200kW installations rather than the standardised 40 foot option; and, importantly, it also provides the option to have a 500oltr buffer tank and to double the size of the fuel store to 23 tonnes in a 40 foot container.

SOLFEX energy systems

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SOLFEX energy systems

Heat pumps – busting the myths

As the demand for sustainable energy soars, owner of Yorkshire Heat Pumps, **Michael Wright**, offers his advice on customers' most commonly asked questions and myths surrounding heat pumps

Myth: You need land to have a ground source heating system, so it's only suitable for rural properties

Buster: While it is common to lay the ground pipe work horizontally at a depth of 1.2 metres, it is also possible to drill boreholes and run ground extractors vertically. This can be more expensive, but requires only a small footprint making it suitable for a town centre driveway.

Myth: Heat pumps are large and can be noisy making it difficult to incorporate easily within the home

Buster: Modern ground source heat pumps are practically silent and give off minimal vibration, making them incredibly easy to incorporate into a utility room. Heat pumps suitable for domestic properties are about the size of a standard fridge freezer so there's no need for a separate room to accommodate one.

Air source heat pumps are fitted outside the building and must comply with strict noise level limits to ensure they don't disturb occupants or neighbours.

Myth: Heat pumps may generate renewable energy but they still use a lot of electricity

Buster: While a heat pump provides heating using renewable energy sources, it does use electricity to run its motor. However, the amount of electricity used is modest and the overall cost of operation is significantly lower than alternative non-renewable heating systems.

Myth: Air source heat pumps don't work in the winter

Buster: In countries much colder than ours - across Scandinavia for example - people use air source heat pumps to heat their homes, because even at sub-zero temperatures the air around us contains heat that, when compressed by a heat pump, generates sufficient energy to heat your home and domestic hot water, however, you may still need some back-up power when temperatures are below 0°C.

Myth: Heat pumps only work if you've got under floor heating in your home

Buster: Heat pumps are low temperature heating systems, where the temperature output is lower than that of a conventional heating system. While this does work best with under floor heating in a well-insulated home, it can also work with existing radiators, although homeowners may need to upgrade to larger, more efficient models.

Myth: Heat pumps are costly to install and it will take time to see financial benefits

Buster: If you're opting for a ground source heat pump, carefully consider how you are going to extract the heat as this will impact on the overall installation costs. An average installation for ground source ranges from £11,000 - £15,000, and for an air source heat pump between £7,000 - £14,000.
The government's RHI scheme is designed to help homeowners or businesses recoup the cost of installation, and in most cases will give a positive return on investment, as well as lower cost heating for the long term. Domestic RHI is paid over a seven year period and non-domestic RHI is paid over 20 years.

Consumer website Which? has produced a helpful guide to RHI, with average installation costs and RHI payments for different property sizes as well as comparisons with other fuel types.

http://www.which.co.uk/energy/creating-an-energy-saving-home/guides/renewable-heat-incentive-rhi-explained/rhi-costs-and-earnings/

Inconvenient truth: Installing a heat pump needn't be difficult despite persistent public misconceptions, says Michael Wright, Yorkshire Heat Pumps

Modern ground source heat pumps are practically silent and give off minimal vibration

The future of training

Working with the *United Nations Environment Programme (UNEP)*, inter-governmental organisations and major universities, the **EEC** promotes best practice in renewable energy and energy efficiency through training courses and conferences.

The training courses for qualifications are held both in classrooms and online, due to the growing demand from busy professionals for short and remote renewable energy courses. Online courses on the EEC's distance learning platform represent the future of online training, by including live tutorials and videos taken from classroom courses held at UK universities.

"Professionals can now study at their own convenience without travelling to course locations, through the flexibility of online learning," said EEC director Paolo Buoni.

Participants on the distance learning courses benefit from the knowledge of University professors and experts in the field; these course lecturers have more than 30 years of experience in the sector, with both practical and theoretical expertise.

Online courses are currently 50 percent funded for installers and other professionals. Training topics include:

- Renewable Energy Solutions
- Solar Photovoltaics
- Wind Power
- Solar Water Heating
- Biomass
- Wave and Hydro Power
- Heat Pumps

training@EUenergycentre.org

Nice price: The EEC's online courses are currently 50 percent funded for installers

Numbers game: Plumb Center's renewables course guarantees no more than eight students per tutor

Keen to learn green

Plumb and Parts Center is helping installers to get qualified for the RHI by offering training courses in renewable products. The low cost, high-quality courses which are accredited by leading bodies such as *BPEC* and *HETAS*, are available in eight training academies across the UK, and run in association with training partner, Sevenoaks Energy Academy.

The courses last from one to five days, so there isn't too much time spent off the tools. As well as product training for solar PV, solar thermal, biomass and heat pumps, installers can brush up on Part L and Part G of the building regulations, so they can ensure all the work they carry out will be safe, professional and efficient.

Each course is tailored so no participant is left out in the cold, by ensuring that there are never more than eight students to a tutor, so everyone gets the attention they need.

Plumb and Parts Center wants to help installers get the most from new opportunities in this ever-changing profession, and training is the best place to start.

www.plumbcenter.co.uk/en/info/training

Casting the net

Worcester, Bosch Group has enhanced its training offering through the launch of its very own Online Training Academy to make training as quick and easy as possible.

Phil Bunce, training manager at Worcester, Bosch Group, comments on the latest development and explains how it enhances the manufacturer's wider training facilities: "We took the decision to launch our own Online Training Academy earlier this year, which has been designed to give installers an interactive platform from which they can refresh their product knowledge, or even introduce themselves to a particular technology prior to a hands-on practical training course.

"The launch of this exciting new platform means we can give installers more opportunity to enhance their industry knowledge than ever before, via our network of Training and Assessment Academies, fleet of mobile training vehicles, or College Links Learning Scheme. With smartphones and tablets now essential components of an installer's toolkit, we are keen to ensure professional development can be enhanced both from the comfort of home and on the road.

"Whilst we anticipated this new training scheme will be well received, we know it will never completely replace our hands-on training programmes. Therefore we will continue to offer, and add to, our extensive range of training courses which include solar and heat pump installation." **www.worcester-bosch.co.uk/training**

Time machine: Worcester's new online training platform will give busy installers more flexibility to learn on their own terms

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Complete training

Working with over 375 approved FE Colleges and private training centres, **BPEC** continues to provide a large range of renewable technology courses required by the modern installer.
All courses are industry recognised and often accepted by the relevant MCS and CPS schemes. The BPEC environmental suite of courses includes:

- Solar Thermal
- Solar PV
- Awareness of Environmental Technologies
- Heat Pumps
- Rainwater Harvesting & Greywater Recycling
- Solid Biomass
- Underfloor Heating Design and Installation
- Domestic Energy Assessment
- Part L Energy Efficiency
- Domestic Ventilation Systems
- Green Deal Advice

BPEC supports the Plumbing & Heating industry through its charity's activities. BPEC provide opportunities for financial support to individuals and groups through the following awards.

- The Support Fund - helps raise skill levels in the industry or charitable projects involving plumbing work to be completed.
- The Sport Awards - helps individuals connected to the plumbing and heating industries who are involved in or connected with sport to improve their skills, reach the next level or obtain a qualification.
- The Life Award offers grants to projects that use plumbing knowledge and skills to improve the lives of others either in the UK or overseas.

www.bpec.org.uk

Beating the competition

To help solve the time-consuming problem of achieving a highly trained workforce, **NICEIC** has developed specialist bespoke packages to help take the pain out of organising training for large numbers of employees.

Over the last few years its dedicated team of training experts has worked with a number of firms, to provide bespoke training designed not only to suit a business' specific individual needs, but which is delivered at a time and place to fit.

Why choose bespoke learning?

- Bespoke learning ensures the courses are tailored to your business and help you achieve the objectives you set for your organisation's professional development programme.
- Identifying the specific training needs of your employees ensures maximum return from your training budget.
- The courses are delivered at a time and place to suit you, saving on travel and accommodation costs.

All of the courses are developed and delivered by leading industry experts.

NICEIC has expanded its range of courses to offer bespoke training in renewables, in addition to electric vehicle charging, home automation and data cabling. It also continues to develop more traditional electrical based courses such as 17th edition and safe isolation.

traininginfo@niceic.com

New direction: NICEIC has moved away from the 'one size fits all' approach by offering tailored training courses

Free is key for Windhager

Windhager has reported a significant increase in demand for its free biomass training courses held at its HQ in Marshfield, South Gloucestershire.

Free range: Windhager's free series of biomass training courses have proven to be a great success at the UK's largest dedicated biomass training centre

Five different courses from W1-W5 cover Windhager product overviews, installation advice, system design, fault finding and commissioning to provide installers with knowledge to confidently recommend and install Windhager biomass systems.

The 500 m^2 facility is fully equipped with showrooms and demonstration boilers to provide hands on learning for heating engineers across all levels of the industry. The W1, W2 and W3 biomass courses provide product overviews of the Windhager biomass range, fuel store components, types of install for varying boilers and the commissioning, maintenance and servicing of the Windhager systems. An introduction to the domestic and non-domestic RHI schemes is also included as well as how to assemble and disassemble the biomass boilers.

Technical system design and advanced commissioning information is provided in courses W4 & W5 to ensure installers have confidence in designing, installing and commissioning systems that integrate controls including the Windhager MES and cascade controls to implement efficient and responsive heating systems.

www.windhager.co.uk/training

Alternative thinking

In 2015 **The Centre for Alternative Technology** (CAT) will offer a HETAS accredited biomass for installers course. Biomass continues to be a growing sector, with most of the funding from the RHI going into biomass systems.

The course is taught in CAT's purpose built biomass training facility which incorporates a variety of installed and demonstration wood pellet, chip and log boilers.

CAT's renewable energy masters degree offers students the chance to study a wide range of technologies. The course combines a series of practical, hands on exercises with design projects, theoretical lectures and research. It can be undertaken part time or full time. This flexibility and the modular structure allow students to continue working alongside completing their masters.

It is accredited by the Energy Institute and the University of East London. For those who just want to find out about one of the technologies covered in the masters programme, units in hydroelectric systems, wind power systems, photovoltaic systems and solar thermal systems are also available as stand-alone masterclasses.

http://courses.cat.org.uk/

Flexi-time: CAT's masters degree courses can be taken either full or part time, enabling students to continue to earning while they learn

Fan club

Daikin UK has invested in bespoke installer training centres in Birmingham, Bristol, Glasgow, Manchester and Woking, with further locations opening in 2015.

The manufacturer offers installers training on its complete range of domestic RHI-eligible heat products, and earlier this year introduced two training courses for the award-winning Daikin Altherma hybrid heat pump system: a one day course open to MCS accredited installers already trained on the Daikin Altherma Low Temperature Split system and a two day course for MCS installers wishing to train on both the Hybrid and LT Split systems.

Attendees also receive a sales and marketing support toolkit, including marketing literature, DVDs, a MCS heat loss calculator, Daikin selection software tool and an MCS020 noise calculator to help comply with Permitted Development Rules.

dRHI is incorporated into Daikin's training offering so that our installers are fully prepared to properly communicate it as an option to the end user.

This includes quick reference guides, explanatory brochures for both installers and homeowners, tariff guides, estimator tools, and video and written customer case studies. One-to-one support is additionally made available via technical and sales teams.

www.daikin.co.uk/mcs

Mind expansion: Daikin has plans to open further UK training centres throughout 2015

Expand your knowledge

For those interested in learning more about the installation of heat pump technologies to take advantage of the domestic RHI, the BPEC Heat Pump Systems Installer course, available from NAPIT Training, could be a great place to start.

Other relevant courses include the Solar Thermal course and a brand new Combined Water Supply Regulations, Part L Energy Efficiency and Vented & Unvented Hot Water Storage Systems course.

NAPIT Training delivers a portfolio of training and assessment along with industry approved courses which are certificated by City & Guilds, Blue Flame (UKAS Accredited), BPEC and Logic. These courses are delivered through a network of regional UK training centres in Nottinghamshire, Bristol and Greater Manchester.

NAPIT Training courses and assessment days are both practical and theory based, with specialist training rigs to aid the learning process. All relevant courses comply with current Building Regulations and British Safety Standards. Many NAPIT courses will also provide evidence of the key skill requirements for Competent Person, Green Deal and MCS membership. **www.napittraining.co.uk/courses/heat-pump-training-course.aspx**

Domestic bliss: BPEC's heat pump course, run by NAPIT Training, is aimed at installers looking to capitalise on the d-RHI

Covering your back

As insurance is a business necessity, it can often be the difference between the right decision and more hassle than your job's worth, as **Paul Williams** Napit Insurance e-trading manager explains

Knowing what you are covered for and what exclusions there are is vital for that peace of mind, but are you aware of whose responsibility it is?

Sub-contractors

It seems obvious but as an employer you are responsible for the health and safety of your employees; but what is sometimes unclear is who the employer may be, and therefore, where the responsibility lies.

There are two types of sub-contractors: Labour Only Sub-Contractors (LOSC), who are classed as employees as such, which makes you responsible for them in terms of Health and Safety in the same way as your direct employees. You must include them under your employers' liability insurance.

Award winners: Napit Insurance was recently named 'UK Broker of the Year' at the UK Broker Awards 2014

Bona Fide Sub-Contractors (BFSC), who are not classed as employees and do not need to be included under your employers' liability insurance, however you must make sure all BFSCs working with you have their own public liability cover.

Whilst it can sound confusing, many public liability policies carry a Bona Fide Sub-Contractors warranty, which obligates you, the contractor, to ensure all BFSCs working with you have their own public liability cover at a certain limit of indemnity, usually to match your own policy.

What are the options?

The key thing to remember is to never leave your business unnecessarily exposed. The correct cover is a must.

So what are some of the insurance policies to consider?

- Employers' liability: Is a legal requirement if you have employees.
- Public liability: Every business is exposed to members of the public. Public liability insurance is necessary to protect your exposure for injury to members of the public and their property.
- Professional indemnity: If you offer professional advice, design or consultancy services, then you need to consider professional indemnity cover to protect you from potential professional negligence claims.
- Van insurance: Insuring your vehicle is a necessity.
- Tools and stock cover: Your tools are likely to be vital for your business to continue its' everyday activities. Therefore, it is essential you are covered for damage and possible theft of your tools and stock.
- Phone insurance: You can often get better deals through specialist trade cover than through your phone company.

Getting the best from your cover

Using specialist brokers within your industry holds many benefits. Not only can it save you money, specialist brokers usually have agreements in place with insurers and can create more bespoke coverage with competitive prices.

Check that you have the right cover for your needs:

- Double check the warranties, conditions, endorsements and exclusions that may be in the policy. Make sure you understand them and are able to comply with any warranties and conditions, failure to do so could very likely invalidate your cover.
- Ensure your business description is accurate and covers all your activities.
- Volunteer any extra information, even if you think it may not be relevant - this could be the difference between a successful or unsuccessful claim.

NAPIT Insurance provides expert advice to NAPIT Registered Installers on insurance and claims. It offers an award winning service, having recently been named as "Broker of the Year" at the UK Broker Awards 2014.

To view the many benefits of becoming a NAPIT Registered Installer visit the NAPIT website at **www.napit.org.uk** or to learn more about the insurance provided visit **www.napitinsurance.co.uk**

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On a par to saving energy

Manchester's Didsbury Golf Club has recently completed a project to replace its costly LPG heating system with an efficient biomass boiler alternative

The system, installed by TGE Group, has a design efficiency of around 95 percent and will realise savings of 31p/kWh compared with the old system.

The 18 hole parkland course in south Manchester welcomes over 300 golfers and visitors a week with its full golfing facilities, lounge, bar and meeting rooms. However, the cost of providing heating and hot water to the site was spiralling out of control and it became clear that an efficient, sustainable, cost effective alternative was necessary.

Tim O'Brien of Didsbury Golf Club said: "We couldn't continue as we were, paying ever increasing LPG costs. Ultimately, we were attracted by TGE Group's all-inclusive offer covering everything from design and installation to aftercare, as well as the generous Renewable Heat Incentive.

"Going down the renewables route for a more sustainable and affordable boiler was definitely the right decision for us. TGE Group has done a fantastic job, and with the system set to be paid back in less than six years, we are looking forward to reaping the rewards of our new system for many years to come."

On the back of an extensive survey and with space at a premium, TGE Group designed a pre-fitted containerised biomass boiler which connected to the existing pipe system to provide heat and hot water to the Club House, kitchen, ten showers and a steward's flat.

Matthew Evans, heat director at TGE Group, added: "The containerised biomass option suited this project as space was tight and it saved having to build a separate unit to house the boiler. The fully fitted biomass and fuel store was lowered directly into its position at the Golf Club, meaning a limited amount of time was spent on site and there was less disruption to the day to day club activities."

On the green: Didsbury's 18 hole golf course opted for a containerised biomass system to combat rising fossil fuel prices

Kingspan study reveals £5bn cost saving to UK plc

UK businesses could save over £5bn in electricity bills by installing fully-funded rooftop PV systems on their roofs, according to a recent study from **Kingspan**

The study adds that installing PV on just 61 percent of the country's 2,500km² of south-facing commercial roofspace would meet the total electricity demand of UK plc.

Compiled by Kingspan Energy's technical team using government figures and performance data, the study was praised by climate change secretary Amber Rudd at the launch of the UK's largest rooftop solar renovation project at Kingspan Insulation's manufacturing plant at Selby, North Yorkshire.

The 2.5MWp system and LED lighting upgrade is set to save 79.2GWh at the site over 25 years – enough to power almost 7,000 homes.

"Our solar strategy sets out our ambition for the growth of solar on roofs and brownfield sites," said Amber Rudd.

"As Kingspan has identified in its own research, the benefits of solar to businesses are huge. Their rooftop array – one of the largest in the UK – shows how companies can benefit, by cutting costs and reducing emissions."

Gilbert McCarthy, managing director of Kingspan Insulation, added: "The economic case for solar PV is clear, especially with the removal of capital cost from the equation. The immediate savings produced by adopting commercial rooftop PV can only increase the competitiveness of UK businesses.

"When you consider the increased savings over time compared with the grid, the opportunity becomes even more compelling."

Raising the roof: Gilbert McCarthy (managing director, Kingspan Insulated Panels), Amber Rudd MP, Spencer Murtagh (operations director, Kingspan Insulation)

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New funding alliance pledges to cut NHS costs

The **UK Green Investment Bank** and **De Lage Landen** have announced a new £50m funding alliance focused on NHS energy efficiency projects

Both parties have agreed to invest £25m in assisting the NHS reduce its £750m annual energy bill. The NHS has already adopted a target to reduce its carbon emissions by 10 percent by 2015.

The first project funded by the alliance will be at The Queen's Medical Centre in Nottingham to finance the installation of a number of measures including CHP and low energy lighting.

The £7.5m cost of the project will be paid back over 15 years, saving 7,400 tonnes of CO_2 each year.

Shaun Kingsbury, ceo of GIB, said: "As one of the country's most energy intensive organisations, the NHS could save up to £150m each year by putting in place energy efficiency measures. That's why GIB has committed to back a wave of projects to modernise and better equip NHS facilities and systems."

Business secretary Vince Cable added: "Through our industrial strategy we are working in partnership with business to give companies the confidence to invest, securing green jobs and a stronger UK economy.

"This latest project in Nottingham is part of the government's continued investment to help the NHS transition to a more energy efficient working environment, cutting greenhouse gas emissions and saving the economy millions each year on reduced energy costs. Without our £3.8bn investment in the UK Green Investment Bank these projects would not have been possible."

Enphase powers social housing project

Enphase Energy is partnering with Wickford-based Saving Energy Ltd to bring solar power to residents of a major social housing project

Backed by a local charity - Northumberland Aged Mineworkers Homes Association, the effort will provide retired miners with PV systems to lower their energy bills and improve their environmental footprint.

The project will feature a total of 4,000 Enphase microinverters installed on more than 400 homes. Slated for completion by the end of 2014, it will generate approximately 1,038,800 kilowatt-hours annually.

"For us as installers, there's no compromise when it comes to the quality and safety of the Enphase System," said Grant Speller, renewable energy manager at Saving Energy.

"Its simplicity is a huge benefit, enabling us to work efficiently and in a safe manner across rooftops, particularly on a project like this where the properties are all close together.

"We're also confident of the benefits the customers will see from the Enphase technology," Speller continued.

"The efficiency and user-friendliness means greater yields, even in the climate of the North East, and greater control for the client in assessing how a resident's system is performing. The retired miners are all very positive about the work going on here and are keen to benefit at a time when energy bills are soaring."

Generation game: 4,000 Enphase microinverters have been fitted in the homes of 400 retired miners in the North East, to deliver greater PV yields

Children of the revolution

Bede's, a co-educational independent school in East Sussex, has undertaken one of the largest biomass heating projects to date in the education sector

The day and boarding school invested heavily in replacing its 23 liquefied LPG and oil boilers with three wood pellet biomass units.

CPL Renewables was selected to complete the project and provide affordable finance to Bede's. With a payback period of 10 years, the £1.2m finance package also paid for the renovation of the school's underground electrical infrastructure and the installation of a Building Management System (BMS).

The biomass boilers are predicted to save £70,000 per annum on energy bills, and reduce carbon emissions by 580 tonnes every 12 months.

Dr Richard Maloney, headmaster of Bede's, said: "At Bede's, we pride ourselves on our proactive pursuit of a green strategy and seize every opportunity available to us to optimise our energy consumption and reduce our carbon footprint.

"We are really delighted with the installation of biomass boilers. With the energy savings and the income from the RHI scheme, we will be cash positive from year one onwards."

Money box: A £1.2m investment in biomass by Bede's School in East Sussex was facilitated by Siemens and the Carbon Trust's Energy Efficiency Financing Scheme (EEF)

Mark Harper, general manager at CPL Renewables, added: "Given that a typical biomass installation can be much more expensive than a normal fossil fuel solution, specialist financing plays a particularly crucial role in enabling large-scale biomass heating projects.

"As Bede's chosen technology partner, we are pleased that we were able to offer the school an all-round solution encompassing both technology and finance."

Historic power network opens its doors

Hundreds of visitors have caught a rare glimpse of the UK's oldest low carbon energy network

Pimlico District Heating Undertaking (PDHU) opened its doors in late September to enable Londoners to go behind the scenes of the CityWest Homes system, managed by Westminster City Council.

PDHU dates back to the 1950s when combating London's notorious smogs was imperative. Today, the grade II listed building continues to provide heat and hot water to 3,256 homes, 50 businesses and three schools via 50km of pipework.

Visitors enjoyed spectacular views from the roof of the accumulator tower, which is the UK's largest thermal store.

David Wickersham, technical advisor, CityWest Homes, said: "PDHU is one of London's hidden gems, and we are delighted to once again give people the chance to discover it.

"It occupies a unique position in the history of sustainable energy generation, and its role will only grow as we continue to look for greener ways to power the capital.

"PDHU has proved a popular attraction ever since it was first opened to the public, and we look forward to welcoming many more visitors for years to come."

Dizzy heights: PDHU's accumulator tower has provided district heating for over 3,000 properties in Westminster for over 60 years

Solar cuts National Ice Centre's carbon footprint

1,000 solar panels installed on the roof of the National Ice Centre and Capital FM Arena in Nottingham 12 months ago have reduced the building's carbon footprint by 118 tonnes and cut almost £40k off energy bills in just one year, reports **EvoEnergy**

The 250 kWp system, installed over six weeks last summer, has generated 224,000 kWh of electricity since it's completion at the end of September last year - 10 per cent more than predicted.

This adds up to an annual CO2 saving of 118,500 kilos for the 10,000-capacity venue, which consumes more than 4 MWh each year. The panels earned over £22k in Feed-in Tariff payments and saved at least £14k off energy bills too.

Lee Chadburn, facilities manager at National Ice Centre and Capital FM Arena Nottingham, said: "The PV system we've installed has exceeded our expectations in terms of the electricity savings we'd originally calculated so we're really happy with how it's performing.

"Having this system in place helps to ensure we can carry on making savings year-on-year, and allows us to be proud of our 'Greener Arena' status as an eco-friendly venue."

Mark Kershaw, project manager for EvoEnergy, said: "The arena is one of Nottingham's most recognisable landmarks so we are pleased and proud to showcase our work with such a prestigious client and venue.

"One year on, it's great to see the impact that solar is having for the venue and to know that each time the world's biggest entertainment stars perform in Nottingham, it's clean, green solar power that's helping them do so."

Ice breaker: The National Ice Centre's 250kWp PV array in Nottingham has broken all expectations by generating 10 percent more electricity than predicted

In numbers:

- 1000 x 250 W panels
- Generation (forecasted): 202,000 kWh p/a
- Generation (Actual): 224,000 kWh p/a
- Arena consumption (average): 12,000 kWh per day

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Council shows flair

Rochdale Borough Council has begun building the first publicly owned solar farm in Greater Manchester to help cement its desire to become the 'greenest' authority in Britain

Construction of a 250kW PV solar farm has started on around one acre of contaminated land behind Rochdale Leisure Centre, on Entwistle Road. The solar farm will operate for up to 25 years and will then be decommissioned or the panels will be replaced.

Work has also begun on adding the council-owned 100kW rooftop solar panels to Heywood Sports Village. The electricity generated from both the Rochdale and Heywood solar panels will be sold back to Link4Life to power the sports complexes.

The solar farms are being built by Southern Solar, whose managing director Howard Johns attended the turf cutting. The council has received technical support from Robin Dummet, of Novus Solar Development.

Councillor Richard Farnell, leader of Rochdale Borough Council, said: "Faced with making savings of £51m over the next two years, we needed to come up with imaginative solutions in tough economic times and come up with an alternative as traditional energy sources become scarcer.

"Options for this site were limited, due to its former use as a waste disposal site and contamination present, so the solar farm has allowed the council to turn this land from a liability to a productive asset."

Mark Widdup, director of Economy and Environment for Rochdale Borough Council, said: "We are leading the way as a 'green' authority and this solar farm will not only bring in revenue for the authority but help us become more energy self-sufficient in a time where fuel bills are on the rise."

Trail blazer: Rochdale Borough Council has kicked off its ambition to become the greenest local authority in Britain by building its very own 250kW array on contaminated land

Weltec receives order for 1.1MW AD plant extension

Weltec Biopower has been granted the contract to extend a food waste AD plant in Piddlehinton, Dorset

Smell of success: After two years successful operation, Weltec have been chosen to build a 1.1MW extension to the Piddlehinton food waste AD plant

Plant owners Eco Sustainable Solutions are expanding the site with a further 1.1MW of food waste processing capacity.

The original AD plant was also built by Weltec and commissioned in 2012. It is fed by local authority food waste and out of date food products. After the extension, the plant will process approximately 37,000 tpa of food waste and will generate an electrical output of 1.6MW.

Electricity generated at the site and excess gas is fed to an adjacent feed mill, or the National Grid. The digestate produced by the plant is collected and used by local farmers.

Weltec sales manager, Kevin Monson, said: "We recognise that an AD plant is a 20 year partnership and that maintaining solid trust-based relationships with our clients is crucial to our ongoing success. Therefore we now have a dedicated UK-based Service and Maintenance capability with locally available spare parts."

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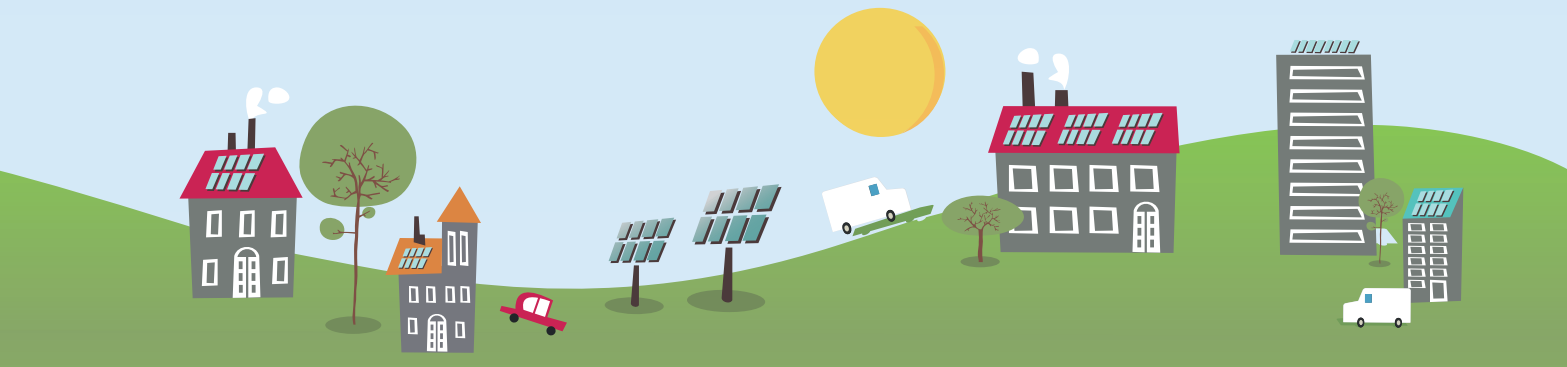

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GEOTHERMAL

What: First UK geothermal production in 30 years

How: Geothermal Engineers Ltd with funding from DECC

Result: Space heating and hot water naturally heated to 60 degrees

Energy secretary Ed Davey has welcomed the first UK geothermal production in three decades in hot rocks at Rosemanowes, Cornwall.

Engineers at the site have successfully demonstrated that water for heating and hot tap water can be successfully raised to the required 60 degrees by using heat naturally present deep underground in the Cornish rock.

The project has been designed and managed by Geothermal Engineering Ltd with funding assistance from DECC.

There are currently two other sites in Cornwall with planning permission for geothermal plants.

Ryan Law, managing director of Geothermal Engineering, said: "Geothermal energy could be a significant contributor to the UK's energy portfolio offering both heat and power. This project shows that GEL can deliver deep geothermal energy in Cornwall and we look forward to developing further projects in the region."

Energy secretary, Ed Davey, added: "We need a broad base of renewable energy in the UK and I am pleased to see that a deep geothermal heat project is finally producing energy. This nascent sector could make a real contribution to renewable heat supply in the UK. I am glad that DECC have been able to support this project via the Energy Entrepreneurs Fund. I wish GEL success for future projects."

Deep thinking: Geothermal Engineering Ltd have reopened the door for geothermal in the UK by beginning production for the first time in this country since the 1980s

BIOMASS

What: North Yorkshire dwelling ditches expensive oil and LPG heating

How: SOLARFOCUS pellet top boiler

Result: £4,500 annual RHI income

IXUS Energy has teamed up with installation partner Yorheat to provide an economic heating solution powerful enough to keep the large, high ceilinged rooms typical of a 1930s property sufficiently warm.

IXUS Energy has worked with customers who own a wide variety of different property types. Most recently was a country home in North Yorkshire consisting of two separate dwellings - the main house and a granny annex. The customer had been using different sources of heat for each at an annual cost of £5,500 - an old, undersized oil fired boiler heated the house while the annex used an LPG fired boiler.

Initially, ground source heating was considered but was ruled out because the age and lack of insulation within the house would have meant extremely costly electricity bills. Following extensive research, the customer realised that biomass was the most sensible option for heating his home and approached IXUS Energy for advice.

Top notch: This North Yorkshire collaboration between IXUS and Yorheat netted the customer £4,500 annual RHI income via a SOLARFOCUS pellet top boiler

A trip was made to the product showroom at IXUS Energy's headquarters in Northumberland and a SOLARFOCUS pellet top boiler was chosen.

IXUS Energy then went on to produce detailed project designs and worked closely with their installation partner Yorheat to plan the extensive pipework required and to ensure that the installation would deliver all of the benefits the customer wanted to achieve from the project. The property had a suitable garage for housing the boiler and a successful installation was completed using underground pre-insulated pipework to connect to the two existing distribution systems in the property.

The customer can now expect to receive approximately £4,500 annually through the government's domestic RHI scheme and will make considerable savings from using wood pellets in contrast to costly fossil fuels. Most importantly, the level of warmth in the property has been transformed and the customer is now looking forward to the winter ahead.

ASHP

What: Farmhouse swaps oil heating for renewable makeover

How: 2 x NIBE F2040 ASHP units

Result: £1,609 annual RHI income

An 18th century farmhouse in Kirkby, North Yorkshire is now benefiting from cost-effective, energy-efficient home heating and hot water after swapping its old oil-fired boilers for a brand new NIBE air source heat pump (ASHP) system.

After extensive refurbishment, the property has been fitted with two NIBE F2040 ASHP units, which provide the farmhouse cottage and 1960s rear extension with a consistent, reliable supply of hot water and space heating.

Owners Pat Battle and Duncan Kirkby opted for the new NIBE system when looking to replace their two old oil boilers, which were very inefficient and costly to run.

Howard Tribick, director at NIBE VIP Installer HT Energy, specified, designed and fitted the NIBE F2040 air source heat pump package system after carrying out a full site survey and heat loss calculation for the property.

He said: "Whilst there was not enough room surrounding Duncan and Pat's farmhouse for ground source heat pump boreholes or ground loops, with the right renovation work the house was perfect for a NIBE F2040 air source heat pump system, which is ideal for retrofit applications like these."

The new system is made up of two 12kW

Real deal: Two NIBE F2040 ASHPs, installed by HT Energy, now provide 100 percent of the heating and hot water needs of this North Yorkshire farmhouse property whilst making significant fuel savings

F2040 air source heat pumps, a 300L NIBE Titanium Megacoil hot water storage cylinder and NIBE SMO40 intelligent controls. As part of the install, the loft, walls and floor of the farmhouse were insulated and extra double glazing was fitted.

Phil Hurley, managing director at NIBE, said: "This project is the perfect example of a fabric-first approach to specifying a sustainable heating system. It shows that with the right steps taken to ensure whole-house efficiency, air source heat pumps can be the ideal solution for retrofit applications like Duncan and Pat's. They wanted to find a heating alternative that was more economically efficient and environmentally friendly than our old existing system. Moving to biomass was the ideal solution for our farm and self-catering holiday business, the Windhager boilers function extremely well with the fluctuating heating demand from the holiday properties and allows a great deal of control over the boilers' outputs at any one time."

Windhager approved installers AP Chant Renewables consulted, designed and installed the system that comprises three Windhager BioWIN 60kW boilers installed in a cascade system with accumulator tanks. A disused stone and brick building in the farmyard was converted into a plant room and wood pellet storage area.

The cascade system has the advantage of allowing boilers to be serviced one at a time without the whole system having to be shutdown. This ensures consistent heating and hot water is provided, an essential factor in providing a high standard of service in the hospitality sector.

BIOMASS

What: West Dorset holiday cottages incorporate biomass heating

How: 3 x Windhager BioWIN 60kW boilers

Result: Lower carbon footprint

A farmhouse and self-catering holiday cottages in West Dorset are being heated by three Windhager biomass boilers.

Pigeon House is set within 1000 acres of farmland that also hosts luxury holiday lets Dove House and Swallows.

Voted among Britain's top 50 holiday cottages, the luxury accommodation in Dove House can provide for 13 people, and includes a heated indoor swimming pool. The Swallows can cater for a further four.

Hugo James, Pigeon House owner, said: "We

Best western: Three highly-rated self-catering cottages in West Dorset have now improved their economic and environmental performance with three Windhager biomass boilers

Figure it out

Generation tariffs for non PV technologies

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

(Source: OFGEM)

Number of MCS registered installers per technology

Technology type	Cumulative number	Registered Aug 14
Solar PV	2660	37
Biomass	339	05
Air source heat pump	877	15
Ground source heat pump	714	09
Solar thermal	978	14
Small Wind	99	0
Total	3156	91

Number of MCS registered installations per technology

Technology type	Cumulative number	Installed Aug 14
Solar PV	579529	9871
Biomass	6586	418
Air source heat pump	30624	331
Ground source heat pump	8816	80
Solar thermal	6873	74
Small Wind	4717	08
Total	637145	10782

(Figures supplied by Gemserv)

Generation tariffs for Solar PV

Tariff band	FiT rate (p/kWh)
<4kW	14.38
>4-10kW	13.03
>10-50kW	12.13
>50-150kW	10.34
>150-250kW	09.89
>250kW-500kW	6.38
Standalone	6.38
Export Tariff	4.77

Domestic RHI tariffs

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

Tariffs apply to all eligible installations installed since 15 July 2009

Green Deal

Month	Assessments	Live GD Plans
Sept 14	29631	489
Total	356514	2581

Green Deal supply chain

Month	Assessor organisations	Providers	Installers
Sept 14	-02	01	-45
Total	391	162	2729

(Source: DECC)

Cost comparison of heating fuels (not including RHI payments)

Fuel source	kWh provided per unit of fuel	Efficiency of system (%)	Units consumed by house (kWh)	Price per unit of fuel (£)	Units consumed per annum	Cost per annum
Heating oil (kerosene)	10 per litre	90	25300	0.54 per litre	2530 litres	£1,366
Wood pellets	4800 per tonne	94	24300	235 per tonne	5 tonnes	£1,175
Natural gas	1 per kWh	90	25300	0.042 per kWh	25300 kWh	£1,062
LPG	6.6 per litre	90	25300	0.41 per litre	3833 litres	£1,572
Electricity	1 per kWh	100	23000	0.16 per kWh	23000 kWh	£3,680
*Air source heat pump	1 per kWh	290	7931	0.16 per kWh	7931kWh	£1,269
*Ground source heat pump	1 per kWh	360	6389	0.16 per kWh	6389kWh	£1022
Dual mode system 1						
Oil boiler (30% of heat load)	10 per litre	90	7590	0.54 per litre	759 litres	£410
*Air source heat pump (70% of heat load)	1 per kWh	290	5552	0.16 per kWh	5552 kWh	£888
Dual mode system 2						
Gas boiler (30% of heat load)	1 per kWh	90	7590	0.042 per kWh	7590 kWh	£319
*Air source heat pump (70% of heat load)	1 per kWh	290	5552	0.16 per kWh	5552 kWh	£888

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

(Source: OFGEM)

Domestic RHI deployment

Technology	Accreditations (since April 14)	% of total
ASHP	3711	37
GSHP	1549	15
Biomass	2208	22
Solar thermal	2580	26
TOTAL	10048	100

(Source: DECC)

What data would you like to see on this page?

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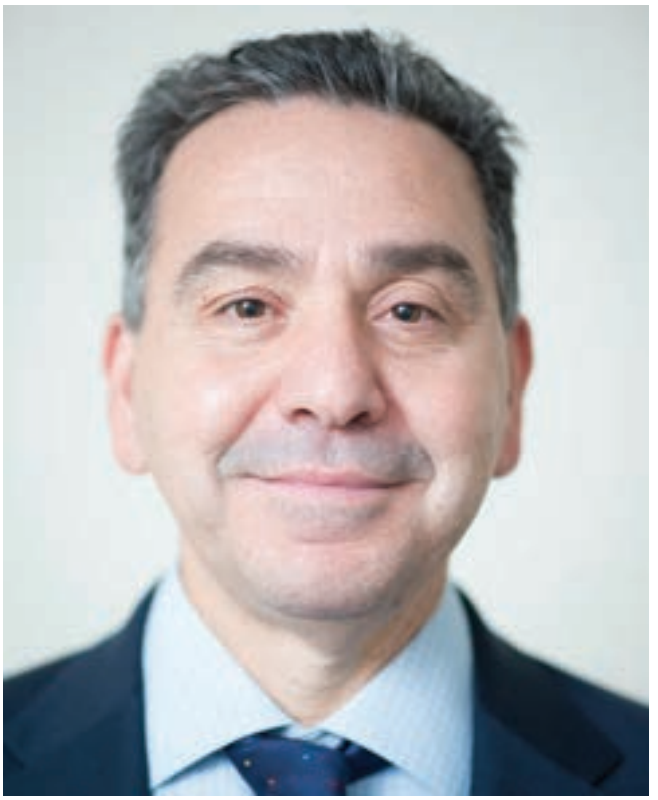
My working week



Who: Giovanni Suero, managing director, Flow Products

What: Flow Products is a research and design company that claims to produce the world's first affordable electricity-generating domestic gas boiler

Growth spurt: Flow Products is actively hiring personnel in all departments and is seeking installers as it ramps up to bring its new CHP boiler to market, says managing director Giovanni Suero

Going with the flow

Monday

I start the morning at 08:00 in our Capenhurst offices. I generally catch up with the team over coffee. I feel strongly that success comes from the people within an organisation and that personal relationships are key, so I try to make sure I speak to everyone - discuss our weekends and the week ahead. I then review the status of our current projects, understanding the timelines and issues we might be facing. I spend the afternoon on a conference call with one of our board members, updating him on project statuses and reviewing key technical issues. Late afternoon, I have my weekly call with the group CEO and update him across the board.

Tuesday

Tuesday is the Group Project Review (Flow Products is part of Flow Group, which includes Flow Battery and Flow Energy), where we review all projects and their links to each other. Each project leader reviews his risks and action list and from this I develop our responses to reduce and or eliminate those risks and support the required actions. In the afternoon, I review departmental budgets with our finance department and, as we are a growing company, review resources and future growth in personnel. Since we're releasing our game changing boiler early next year, we're expanding significantly and hiring personnel in all departments.

Wednesday

An exciting day as we have the official opening of our new Flow training facility! The centre, located near Runcorn, is capable of training over 3000 engineers per year, who then can become certified Flow Installers and gain MCS accreditation. Our local MP, Graham Evan's cut the ribbon at the opening ceremony. A large number of partners, suppliers and future customers also attended, making the opening a fantastic success. Anyone is welcome to come visit our facility and see our boiler in operation, generating heat and electricity.

I spend Wednesday afternoon reviewing supplier status reports, keeping on top of any issues that might affect our production schedule and reviewing my agenda for a visit to Italy to meet two key suppliers the following week.

Thursday

In the morning I review and update the notes from the previous board and senior management meetings before sending them to my CEO for his approval and distribution. In the afternoon, I meet with our test and validation team for an update on the current results on component testing (we continuously test components and make improvements and changes to enhance the performance of our products). This is followed by a visit to our boiler testing facility to review performance statistics.

Friday

Casual day. So I exchange the suit for jeans and sweatshirt. In the morning, I have a meeting with our service and installation manager, covering the current pilot installs of our microgeneration boiler. All is going well and our pilot customers are extremely pleased with the performance of our boiler and with the installation and support we've provided. In the afternoon, I finalise trips to Italy and Germany to visit key suppliers and update them on our progress and plans for the next two years. I also plan a trip to Scotland to visit our partner, Jabil, who will start the manufacturing of our first boiler in November. Last item is to put my £2 in the lottery draw!

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