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Editor's comment

A league of our own

Thanks to the dire performance of the England team, and let's face it, my fair-weather attitude to football, it seemed a lot more interesting to me to consider the rankings of Euro 2012 participants in the renewables, rather than the football league.

What is interesting is that all the countries that made it into the Euro semi-finals, whilst of course excelling at the beautiful game (I think) also have a credible renewables background.

Of them all, Germany is the one that stands out. According to Ernst & Young analysis, Germany is ranked third globally, in the renewables index (May 2012). It is also ranked above Spain, Italy, Portugal and the UK, for both wind and PV. However, what is encouraging to see is that the UK sits sixth globally (40 countries are listed) for renewables, and out of all these countries listed, is second for wind and joint third for PV.

Of course, there is still work to be done but the figures are present a positive picture. There is still anti-renewables feeling amongst the population. Indeed, I experienced this recently when asked to comment upon a plan for a wind farm in Wiltshire. Many of the arguments against wind turbines turn to the high decibel noise and damage to the landscape they produce – of course all highly exaggerated in a bid to make a point. What is puzzling is why there is vehement opposition to wind. What are the alternatives to the generation of electricity? A power station? Isn't that far more of an eye-sore? Isn't it also far more damaging to the landscape?

Whilst the UK is clearly doing a great job in promoting and furthering the cause for renewables, barriers need to be overcome and the benefits of renewable energy highlighted loud and clear so that we aren't continually battling against these urban myth-like notions that rear their ugly heads. Once we do, renewables will really take off. Maybe then we can take on Germany in the renewables world although it may of course be a long time before we can have a hope of challenging them on the football field.

"Green Deal Providers will offer incentives to customers" Phyllis Boardman, Green Deal Manager, p14

Industry reaction to August start for revamped Feed-in Tariff

As the government announces it long-awaited response to the Feed-in Tariff, **Paul Stephen** gauges the industry's reaction

Energy minister Edward Davey has served Parliament with the statutory 40 day notice period required to introduce Feed-in Tariff (FiT) reductions from 1 August – a month later than was previously thought.

A decrease from 21p/kWh to 16p/kWh for domestic installations has been confirmed whilst the duration of the scheme will also change from 25 years to 20. The export tariff for energy sold to the National Grid will increase to 4.5p/kWh.

Although many installers have accepted the new rate and praised the Department of Energy and Climate Change (DECC) for firm decisions, a more mixed response seems to be the case for the degression mechanism which will see a baseline reduction in FiT of 3.5 per cent every three months.

The exact percentage reduction will be dependant on deployment and could rise to as much as 28 per cent in the event of over deployment. In the opposite circumstances of low uptake, however, there is the ability to suspend any degression for two consecutive quarters. The next cut is due on 1 November.

Photon Energy director, Jonathan Bates, said: "The new rates will provide a good return, proving that solar is still good for business. This latest announcement should make the situation much more stable, and it is now up to the industry to react and change the perception that the FiT scheme has ended."

Chris Hopkins, managing director of **Ploughcroft**, said: "Although we had hoped that the government would hold the Feed-in Tariff for 12 months, this announcement does provide greater clarity for both the solar industry and homeowners. Homeowners now have complete visibility in what the rate will be going forward, which we have never had before and there is obviously an incentive to install sooner rather than later."

Generation tariffs for new solar PV installations from 1 August 2012

Band(kw)	Standard generation tariff (p/kWh)	Multi installation tariff (p/kWh)	Lower tariff (p/kWh) (if energy efficiency requirement not met)
▪4kW (new build)	16.0	14.4	7.1
▪4kW (retrofit)	16.0	14.4	7.1
>4-10kW	14.5	13.05	7.1
>10-50kW	13.5	12.15	7.1
>50-100kW	11.5	10.35	7.1
>100-150kW	11.5	10.35	7.1
>150-250kW	11.0	9.9	7.1
>250kW-5MW	7.1	N/A	N/A
stand-alone	7.1	N/A	N/A

On balance, the changes are less toxic than we feared

Harry Shepherd-Cross, **Ardenham Energy**, said: "On balance, the changes are less toxic than we feared. In particular, the increase to the export tariff is a sensible move as it brings it in line with the wholesale market at no cost to the FiT budget. There is an obvious disconnect between the 800-1,000MW per annum that the new degressions are based on and the 2,500MW per annum required to meet the government's 22GW target of solar PV by 2020. We would like to see digressions based on a quarterly target consistent with that aim."

Pierre Cesbron, business development manager UK, **REC Solar**, added: "We consider the solar FiT cuts announcement and presented degression mechanism crucial to the long term development of the solar industry. Yet we are concerned by a subsidy reduction that does not allow business and those in this industry to have the long term visibility to allow the industry to grow in a sustainable way."

Money talks: From August 1 the export tariff will rise to 4.5p/kWh

We will exceed 22GW target says STA's Noble

The Solar Trade Association's (STA) PV specialist Ray Noble says there is room for optimism in the PV industry and that we will exceed the government's target of 22GW in 2020, reports **Paul Stephen**. Noble adds that returns on investments (ROIs) are potentially higher than previously thought.

According to Noble, figures used by the Department of Energy and Climate Change (DECC) to predict ROIs of 6-8 per cent at the current domestic Feed-in Tariff (FiT) rate of 21p/kWh are no longer accurate. Noble's own figures, which he says are based on more up-to-date installation price data, show much lower system prices and thus increased ROIs.

"The gap between my figures and DECC's shows that there is a healthy margin out there," said Noble. "We don't need low hanging fruit to make things work.

"The prices used in DECC's FiT impact assessment to develop the new tariffs calculated an ROI of 6-8 per cent. However, as usual, the industry has moved on quickly and installed prices have reduced making actual ROIs much higher.

Size	DECC's Installed Price/kWp	Current Prices
<4kW	£2493	£2000
4-10kW	£2207	£1800
10-50KW	£1956	£1500
50-150kW	£1834	£1400
150-250kW	£1659	£1300
250-5000kW	£1265	£1100
Standalone	£1265	£1050
Aggregators <4kW	£2231	£1500
Aggregators >4kW	£1893	£1500

"Price will continue to drop for at least the next five years. We have reached the current levels far quicker than we ever dreamed of so it's a great industry to be in. Prices have changed so dramatically that it's a case of now re-educating the public that these ROIs are likely to remain similar at 16p after 1 August."

Noble also praised PV installation figures released by DECC in June which point towards a steady weekly increase in deployment of around 620kW since April's seven day average of 2MW.

He added: "It is a good trend that is increasing. Most installers I talk to are seeing a rise in enquiries and I believe things are picking up. My opinion is that we will exceed the government's target of 22GW in 2020. Big hikes in energy prices and possible blackouts from power stations being switched off will force the message through on solar."

Trina reaches out

PV manufacturer Trina Solar has launched its UK installer partner programme following a successful roll out in Spain and Italy. Trina Solar Partner Plus rewards loyalty from installers by offering bonuses and membership privileges whilst also providing training, product information and technical support.

Ben Hill, head of Trina Solar Europe, explained: "It's about incentivising installers, supporting installers and helping them grow their business. We did a significant amount of research by talking to installers in the UK and asking them 'What do you really need?'

Paying dividends: Ben Hill, head of Trina Solar Europe, says his company's partner programme will reward installers for their loyalty

"A lot of the installers are comfortable going out and installing and selling but feel they need support and somebody to talk to if they have a question.

"There are other programmes installers can join but the uniqueness of Trina's is the way we've developed it. For me, if you're not actually supporting the installer then their business growth will have very weak foundations.

"As with any loyalty card-type programme, the benefits go up with the more you buy. Whatever the installer is looking for, perhaps a better price or credit, we can offer as a result of his loyalty to the brand."

News in brief

The Waxman Group, specialist in the design and distribution of solar PV systems, has appointed James Shakespeare as business development manager within the renewables division.

Cumbrian-based Sundog Energy has been selected by Samsung to spearhead its drive into the UK solar market. For the first time, Samsung's top-quality, black-framed 250W panels are available in the UK and will be distributed by Sundog Wholesale, the distribution arm of Sundog Energy.

The Travis Perkins Group has joined the UK Green Building Council. This further emphasises the Group's commitment to help its customers' new-build and retrofit sustainable building projects, says Travis Perkins.

Viessmann's managing partner, Dr. Martin Viessmann has been made an honorary Doctor of Science by the University of Wisconsin-Oshkosh. The Viessmann Group, and its BIOFerm Energy Systems subsidiary, have worked in partnership with the university for many years.

Enecsys, supplier of micro inverter products for the global solar market, has appointed of David L. White as chief financial officer.

Dimplex Renewables has scooped two silver awards from the Sustainable Ireland Awards for its EC-Eau hot water cylinders and its R&D laboratory.

Windhager products are now available from the Plumb Center part of the Wolseley group, and PTS part of the Travis Perkins group. Windhager UK is also working with the merchants on training, product information and informing installers about the technology.

Mitsubishi Electric has revamped its Green Gateway website. It offers information on the impact of the built environment on emissions and the off-the-shelf technologies that are available. It includes customer testimonials and details of Mitsubishi Electric's recycling programme for air conditioning and heat pump systems that have reached the end of their useful working life.
www.greengateway.mitsubishielectric.co.uk

Law firm Walker Morris has appointed renewable energy specialist, Frazer Peavoy, to complement its existing legal team. The appointment is the latest in a string of senior appointments to its renewables, energy and resources group.

Ploughcroft and UTN open Green Deal-ready training centre

Ploughcroft has opened what it says is the first Green Deal-ready training centre, in partnership with UTN Training.

The purpose-built training centre, based in Wakefield, West Yorkshire, will provide Green Deal and renewable energy installation courses, as well as health and safety courses, for anyone involved in the construction sector.

The centre boasts a 14,500 sq ft indoor training area with 15 fully equipped classrooms, which can cater for 180 delegates at any one time. It has a further 3,000 sq ft outdoor training area. The training centre also features a 25m long training roof, work bays for solar PV, solar thermal, as well as dedicated training areas for heat pumps and biomass boiler installation. There is also an external training facility for wind turbine installation.

Chris Hopkins, managing director of Ploughcroft, said: "We are really excited about the new training centre as, from August, a full turnkey training solution for Green Deal installers and Green Deal assessors will be in place, opening up new opportunities for construction industry professionals. The centre will be capable of upskilling 10,000 people per year, so will help meet the government's ambitious targets for full Green Deal adoption across with the UK, with a fully qualified Green Deal workforce."

Twice as good: Ploughcroft managing director Chris Hopkins and Steve Fisher Chairman of UTN (left) outside the new training centre

Steve Fisher, Chairman of UTN, said: "We are delighted to be working with Ploughcroft to deliver the very highest quality health and safety training to help meet the needs of the construction industry. With Ploughcroft's expertise in renewable energy and our reputation for health & safety training, we have everything that a construction worker needs to meet market demand."

Renewables at record level

2011 saw record levels of investment in renewable energy as a global rise of 17 per cent took it to an unprecedented level of $257bn, according to a report issued by the United Nations Environmental Programme (UNEP).

The report shows that despite a tough economic landscape, green energy generation expanded into new markets and closed the gap on fossil fuels. UNEP's figures show gross investment in fossil fuel capacity during 2011 as $302bn compared to $237bn for renewable generation. Renewables counted for almost half the 208GW of electric capacity added globally in the 12 months.

The Renewable Energy Association's head of external affairs, Leonie Greene, said: "Renewable energy is now a very big business internationally. From householders looking to turn their homes into micro-power stations, right through to the biggest investment banks in the world, millions of people are investing billions of pounds in renewables.

"If government is looking for a road out of the economic doldrums, it could hardly do better than strengthening our position in this booming global market."

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Report highlights opportunities to be had in renewable heat

The somewhat unpredictable renewable heat market has caused concern for installers and investors alike. **Renewable Energy Installer** has partnered with Sustainable Venture Intelligence to produce a comprehensive appraisal of the current state of the UK market and the opportunities for growth within it.

The Renewable Heat Market report series provides an essential and timely analysis of the sector, analysing current macroeconomic drivers and consumer needs, forecasting the future performance and payback periods of applicable technology and enabling business to plan strategically for development and growth. With specially targeted technology profiles and market analysis across the domestic, public/commercial and industrial markets, the series provides a rare and detailed examination of UK renewable heat for all stakeholders.

Renewable Energy Installer is offering readers an exclusive discount on the price of the report: To download a free executive summary and preview, go to **www.svionline.co.uk/renewable-heat-details** and use the promotion code REI15 at checkout or on the order form.

Panasonic Solar's gold bid

Panasonic Solar has helped develop a sustainable houseboat, featuring its HIT solar modules, which will be home to a team of Danish competitors, during the Olympic games. The project is a result of work with Sanitov Studios, a design think tank developing sustainable designs for an urbanised future, and Enviko renewable energy solutions

The houseboat is the first prototype of a design that is expected to precede the rollout of more sustainable, flexible houseboats. Featuring Panasonic's flagship hybrid solar module, the H250, the solar power created by the houseboat's solar system produces 1716 kWh – enough to fully supply an average single household, but without a single ton of CO2 emissions.

The Olympics themselves have increased awareness of the benefits of renewable energy and despite The Games missing their renewable energy targets, they have succeeded with their low carbon emissions targets and consumers are recognising the potential involved. The number of different incentives and schemes surrounding renewable energy, such as the solar

Plain sailing: Panasonic Solar has helped develop a sustainable houseboat, featuring its HIT solar modules

modules being installed on top of Blackfriars Bridge, has clearly increased in recent years, and London is becoming a prime example of how a sustainable future is possible.

"London businesses and residents alike are conscious about their energy consumption, carbon footprint and social responsibilities", Enviko says. "With global attention focused on London this summer, we're looking forward to further increase in awareness and interest in solar energy, " commented Alastair Gardner, Enviko.

Events

Renewables Roadshow
13 September Ricoh Arena, Coventry
18 September Westpoint Arena, Exeter
20 September International Centre, Harrogate
26 September SECC, Glasgow
28 September Event City, Manchester
03 October Wembley Stadium, London
www.renewables-roadshow.co.uk/

Solar Power UK 2012
2-4 October NEC, Birmingham
www.solarpowerukevents.org/

Energy Solutions Expo
10-11 October London Olympia
www.energysolutionsexpo.co.uk/

The Renewables Event
11-12 September NEC, Birmingham
www.therenewablesevent.com/

The Energy Event
11-12 September NEC, Birmingham
www.theenergyevent.com/

Oil & Renewable Energy Show
17-18 October Manchester Central
www.oilandrenewableenergyshow.co.uk

ICE Retrofit Solutions for non-domestic buildings 2012

Non-domestic buildings account for 20 per cent of the UK's total carbon emissions and an estimated 80 per cent of the 2050 building stock is already standing. In order to reach the government's target of an 80 per cent reduction in emissions by 2050, the efficiency of our existing buildings must be improved.

ICE Retrofit Solutions for Non-Domestic Buildings 2012 will deliver presentations focussed on overcoming the barriers to this large-scale retrofit work. The high-level speakers will specifically address: Funding and procurement regulation and accreditation and industry case studies of non-domestic retrofit.

The event will take place on 26 September in London – venue to be confirmed.

Visit ice-retrofitnondomestic.com or call +44 (0)20 7665 2023.

Working Hard

REI finds what took **Kevin Hard**, EvoEnergy, from panel installer to figure-head at one of the UK's leading renewables companies in five years

Just five years ago Kevin Hard was standing on a roof installing his first solar panel. Now he runs EvoEnergy, a business that has carried out almost 5,000 installations with a turnover last year of £26 million.

It is a growth that has been driven by Hard's passion for renewable energy. Back in 2007 Hard had just qualified with a phd in hydrogen fuel cells from Nottingham University.

"I really enjoyed building test beds and putting kit together," he recalls.

"I picked up all sorts of skills in plumbing, electrics and construction. I was studying renewable energies through fuel cells, but I just thought solar power was such a cool thing, had such potential that I had a feeling it was the way to go."

With just £30,000 in capital, he set up a website, travelled to Germany to see solar panel installations and read every manual he could. Then he took his first order.

He has never looked back. EvoEnergy now has headquarters in Nottingham, with offices in London, Bristol, Halifax and Cornwall.

The company has won some major awards. Last year it was voted Installer of the Year by the Renewable Energy Association. It has carried out some of the largest installations in the country and has fitted solar power systems on buildings from the Orkney Islands to Penzance.

So how has he managed it? "For one thing I have had to look at myself very hard," he says. "I have to see how to push myself and how to motivate others too."

But it does not stop there. Everyone recruited by EvoEnergy has to match Hard's passion for solar power.

"Whether we take on fitters, electricians or sales people, they all have to be passionate about what we are doing, about renewable energy," says Hard.

"It means they are committed to getting things right, they want solar energy to work, so they make sure the systems they sell or install are the best ones for the customer.

The Hard line: Kevin Hard, EvoEnergy, believes solar power is only a few years away from reaching grid parity

"We even have a boot camp for our sales team. We make sure they spend time out at a site, so they know everything about the business."

This is something Hard knows all about. As the company has grown he has had to learn new skills in areas like accountancy, marketing and human resources.

But he has not forgotten the days when he was fitting solar panels himself.

"I"ve been in a hot stuffy attic, with bees buzzing around my head as I worked on an installation. But I've got to confess, I'm a lot happier running a nationwide company than I was standing on roofs fitting solar panels."

And despite the problems the industry has faced, Hard is still optimistic about the future. EvoEnergy's commercial arm is booming, with demand from contractors, farmers as well as the public sector and business reaching record levels.

"I know the industry has gone through a difficult time but we are still winning customers and growing our market share," he says. "The Feed-in Tariff has been cut but so too have prices – we are still offering customers return on investments of up to 11 per cent, which is exactly the same as we were offering this time last year. Besides, there are more reasons than just the feed in tariff for installing solar power. It gives homeowners security against rising prices and cuts their electricity bills. Meanwhile businesses are coming under increasing pressure to cut down on their carbon emissions."

He believes solar power is only a few years away from reaching grid parity, the point at which it is the same price on the market as electricity produced from fossil fuels.

"When we hit that point, solar will go from being a technology that's good to have, to one that it is vital to have."

And despite the problems the industry has faced, Hard is still optimistic about the future

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Red, amber or green?

Phyllis Boardman, director of Green Deal Manager, looks at the abundance of Green Deal opportunities and asks – are you ready?

The Green Deal, due to launched in October 2012, is a scheme for UK existing domestic and non-domestic properties. It is designed to finance all or part of a package of energy efficient 'measures, products and systems' which are classed as eligible for Green Deal finance, including subsidies under the new Energy Company Obligation, and which are proven to raise the energy performance of a building.

Green Deal Providers will offer incentives to customers of low interest loans with no up-front costs to be paid back through a charge on electricity bills

Green Deal Providers will offer incentives to customers of low interest loans with no up-front costs to be paid back through a charge on electricity bills. Loans will be calculated on estimated energy bill savings likely to result from installing measures. The 'Golden Rule' caps repayments and will be collected by electricity companies on behalf of the Green Deal Provider. The loan will stay with the property and will be taken on by any subsequent utility bill payer.

To deliver the Green Deal, the supply chain needs to gear up to a sufficient capacity. To put this into perspective, there are 639 million households with insufficient insulation; 6 million homes without full double glazing; and 70 per cent of homes without a full set of heating controls. Green Deal Providers will encourage a whole house approach by installing multiple measures at one time which will expand supply chain capacity to deliver installations in millions of homes.

Green flag: Phyllis Boardman, Green Deal Manager, highlights the opportunities to be had from the Green Deal. Pictured with Greg Barker

In order for SMEs to gain a competitive advantage, they need to re-align their business and develop new skills. A number of business models will evolve; for example, those who will deliver every part of the Green Deal in-house; those who wish to specialise in one function only; and those who wish to partner with other specialist organisations.

Green Deal has consumer protection and robust standards to ensure it operates effectively to enhance customer confidence. The framework will be supported by a pool of certified organisations which will provide Green Deal Advisor services and

In order for SMEs to gain a competitive advantage, they need to re-align their business and develop new skills

Green Deal Nationwide
PB Energy Solutions Ltd

the installation of measures. For installers, a robust certification is required to undertake retrofit refurbishments, not only for Green Deal financed work but also under the Energy Company Obligation for hard to treat properties, low income and vulnerable households. However, there are a number of perceived barriers to entering the market for the SME sector.

Phyllis Boardman of PB Energy Solutions' Green Deal Nationwide has been working to shape policy for SMEs to ensure their market share. An example of her work is the Green Deal Consortia (**www.greendealconsortia.co.uk**) which is an SME-led model designed to deliver Green Deal work for a partner pioneer Green Deal Provider, YESprojects.

Another barrier for SMEs, in particular sole traders and micro-SMEs, is the PAS 2030 standard for installers. To embed the standard into a business requires the implementation of a core management system together with additional requirements per measure to be installed. To overcome this onerous task, Boardman has designed, in simple format, a suite of documents which acts as a fast-track, affordable, achievable and streamlined means of compliance.

The Green Deal Manager, a web based tool (**www.greendealmanager.co.uk**) secures consistency between installations, operatives and surveyors and enables assessment of competences to ensure minimum standards. The Green Deal Manager also communicates standards effectively from within an organisation right through to customers, Green Deal Providers and certification bodies including employees and sub-contractors.

For up to date information on the Green Deal visit **www.greatgreendeal.co.uk**

Kitemark recognises best practice

BSI has developed a new Kitemark for Energy Efficient Buildings against which it will certify Green Deal products, advisors and installers in support the government initiative

The Green Deal is a government scheme that allows homeowners to purchase energy efficient insulation and technology for their properties without any upfront charge, the cost of which will be applied to energy bills and will be offset by future savings on energy use.

BSI's new Kitemark for Energy Efficient Buildings will be applicable to all products and installations covered under the Green Deal. It is intended to enhance consumer understanding of the initiative, reassure homeowners about the quality of the various Green Deal suppliers, and give people the confidence to take part in the scheme.

The value of having a trusted quality mark in this area is reflected in BSI's recent research which demonstrates that only 20 percent respondents are currently set to participate in the scheme.

"The insights from our survey reinforce the view that by applying the Kitemark to their offering, manufacturers, advisors and installers can increase sales by helping consumers identify products and services that comply with the Green Deal," said Elaine Munro, global portfolio manager at BSI. "Following successful completion of the pilot BSI will be working closely with its clients to reassure customers and encourage their participation in the scheme to make it a success."

Kitemark is the UK's widest known certification mark with over half of respondents in BSI's Green Deal research confirming that they would be more likely to use Kitemark certified products, advisors and installers.

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It's in the mix

Kingspan is a sponsor of the Oil & Renewable Energy Show. The company's **Alan Wright**, chats to REI about the event and the reasons behind Kingspan's decision to support the show at Manchester Central on 17 and 18 October

What prompted you to add the Oil & Renewable Energy Show to your exhibition calendar?

Our business is dedicated to high quality environmental and renewable products, systems and services. This is an ethos that we see clearly showcased by exhibitors at this show and we are therefore delighted, once again, to be proud sponsors.

Make a splash: Kingspan offers a host of expertise including rainwater harvesting

What can visitors expect to see from Kingspan at the show?

Our focus will be on demonstrating the very latest in rainwater harvesting systems, solar thermal wind turbines, fuel storage, tank technology and monitoring platforms. Innovation and creativity are embedded within our culture, nurtured through investment and paying close attention to what our customers say to us, so it's no surprise that we have some exciting new products for visitors to come and chat to us about.

What do you think lies ahead for the market in 2012?

There is little doubt about the impact that climate change will have on our economy, our environment, and our society. Indeed, the effects are already starting to be felt through our changing weather patterns and of course the recent drought.

We see the market expanding rapidly to respond to the need to reduce the impact of climate change with demand rising for products covering everything from energy generation to sustainable water management. The government is supporting this growth through initiatives such as the Renewable Heat Incentive (RHI) and the Green Deal, which are undoubtedly helping drive consumer confidence and fuelling greater demand for renewable technologies, over the next 12 months and beyond.

Top notch: Solar thermal will be on display at ORES on the Kingspan stand

How do you see your business model changing in the next twelve months?

We are currently the UK's leading manufacturer of rainwater harvesting systems; our small wind turbines are the most robust in the world; we provide complete solar packages that are 100 per cent designed and manufactured in Europe; and we have over 30 years experience manufacturing market leading fuel storage and tank monitoring technology. It's quite a portfolio, but we see it as a springboard for more innovation. Come along to our stand and find out more!

Why should people visit your stand?

To see some outstanding new products and initiatives! Put simply, the Kingspan environmental stand will be a tremendous display of the latest in fuel storage solutions and renewable energy technologies.

Why are oil and renewable energy good bedfellows?

For those already working in the oil heating sector, diversifying into complementary sectors such as renewable energy technology or sustainable water management makes good business sense. Meanwhile, renewable technology suppliers can reach out to the oil industry to persuade those who work within it to branch out and include renewables within their business model.

Strength in numbers

The Solar Trade Association's new chairman Alan Aldridge has laid out his vision to take the organisation forward, reports **Paul Stephen**. And as part of that he calls for the STA to have more influence with DECC

Having replaced outgoing chairman Howard Johns, the managing director of Riomay, Alan Aldridge, has stepped up to the plate following two years experience on Solar Trade Association's (STA's) board.

Aldridge says he would like an improved relationship with the Department of Energy and Climate Change (DECC) and puts increasing membership high on his wish list.

He says: "We've got a track record of working very well with DECC but I would like to us become even more influential. The more information we can bring to them, the more we can help influence the policies coming through to a level where we can get a steady, growing marketplace.

"I think membership could also be a challenge. It is a very turbulent time and some people may be considering exiting the industry. At a time when margins are being squeezed and an installer is being squeezed, then membership is one of those things that they might have to look at.

"I would also like to strengthen the board of the STA. That means growing it with very high calibre people and improving our recognition throughout the UK that the STA is

We've got a track record of working very well with DECC but I would like to us become even more influential

the voice of the industry."

Aldridge points out that membership of the STA remains the most effective way for installers to have their voices heard on a national scale.

He adds: "There are a number of very good reasons to become a member. It's an excellent route for any installer to have an influence on government policy. Individuals cannot always go knocking on government's door but, through the STA, they could.

"We also forget sometimes that it is a very good source of industry expertise and a way to network with peers and other installers.

"Being able to use the STA logo is also a great credibility building tool for installers."

Turning to the industry as a whole, Aldridge says the STA, installers, government and other stakeholders have a collective responsibility to repair what he calls a 'perception issue' among consumers left confused by the recent changes to the Feed-in Tariff (FiT). Once consumers realise the continued financial attractiveness of PV, Aldridge predicts phenomenal growth in the sector as we move closer to grid parity.

"The consumer now has a perception fixed in their mind that's not accurate," he adds. "And until we shift that, I don't think we will see all the buoyancy coming back into the marketplace. I accept responsibility that we, as a trade association, need to work on this and get the message out as best we can - although the STA is not funded to take a task of that size alone.

"Consumers haven't appreciated the rate at which costs have been falling. They see 50 per cent being slashed off the tariff but, what they don't realise, is the compensatory reduction in cost. The returns are not grossly dissimilar to when FiT was launched.

"When we get to grid parity, we won't need subsidies and we, as a country, will be producing green energy at the same cost as fossil fuel. That's a great place to be. I think PV will go from strength to strength now we are entering a phase of steady market growth rather than boom and bust."

Bigger picture: New STA chairman Alan Aldridge says his organisation is a route for installers to have a say on government policy

Figure it out

Each issue of **REI** brings you a range of industry statistics. We highlight changes to the Feed-in Tariff, look at global statistics for the year 2011 and MCS installation figures in this issue

Standard generation tariffs for renewable technologies

PV until 31 July	
≤4 kW Higher rate	21.0p/kWh
≤4 kW Medium rate	16.8p
>4 - 10kW Higher rate	16.8p
>4 - 10kW Medium rate	13.4p
>10 - 50kW Higher rate	15.2p
>10 - 50kW Medium rate	12.2p
>50 - 250kW Higher rate	12.9p
>50 - 250kW Medium rate	10.3p
≤250kW Lower rate	9.0p
>250kW - 5MW	8.9p

PV from 01 August	
4kW	16.0p/kWh
4-10kW	14.5p
10-50kW	13.5p
50-100kW	11.5p
100-150kW	11.5p
150-250kW	11.0p
250kW-5MW	7.1p

MicroCHP*	
<2kW	11.0p/kWh
Wind*	
<1.5Kw	35.8p/kWh
1.5-15kW	28.0p
15-100kW	25.4p
100-500kW	20.6p
500kW-1.5MW	10.4p
1.5MW-5MW	4.9p

Hydro*	
<15kW	21.9p/kWh
15-100kW	19.6p
100kW-2MW	21.1p
2MW-5MW	4.8p
Anaerobic digestion*	
<250kW	14.7p/kWh
250-500kW	13.6p
>500kW	9.9p

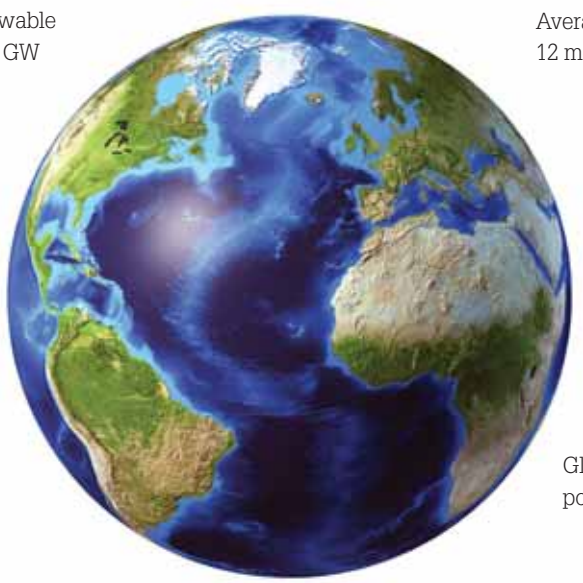
**Subject to change following DECC FiT consultation part 2B*

2011 at a glance

Total worldwide renewable power capacity 1,360 GW

Average PV module price drop over the 12 months 50%

Number of nations with renewable energy targets in place 118



Average drop in the cost of generating power from onshore wind 9%

Renewable source's share of global power consumption 16.7%

Number of nations with Feed-in Tariffs 65

Global investment in solar power $147bn

Global investment in renewable power and fuels $257bn

Renewable energy's share of new generating capacity 44%

Top seven nations for renewable electricity capacity (excluding hydro) - China, USA, Germany, Spain, Italy, India, Japan

Source: Global Trends in Renewable Investment 2012 report – United Nations Environment Programme

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Number of registered installations per technology since January 2011

Technology type	No of domestic installations total number	Last month available*
Solar PV	323,600	9,470
Biomass	1,247	20
Air source heat pump	6,913	215
Exhaust air source heat pump	202	21
Ground source heat pump	2,356	41
Hydro	63	0
Micro CHP	480	11
Solar thermal	9,069	226
Wind	2,429	98
Total	346,359	10,142

(Figures supplied by Gemserv) * May 2012

Number of registered installers per technology since 2009

Technology type	No of registered installers	Last month available*
Solar PV	4,287	19
Biomass	213	-02
Air source heat pump	872	06
Exhaust air source heat pump	538	04
Ground source heat pump	740	03
Hydro	28	0
Micro CHP	18	-01
Solar thermal	1.221	-0.1
Wind	148	-06
Total	4,965	35

(Figures supplied by Gemserv) * April 2012

Renewable Heat Premium Payment grants

All houses

Solar thermal - £300 – cash voucher valid for 3 months

Houses not heated by gas from the grid

Biomass boiler - £950 – valid for 6 months
Air source heating pump - £850 – valid for 5 months
Ground source or water source heat pump - £1250 – valid for 6 months

(Source: Energy Saving Trust)

RHI non-domestic rates

Tariff name	Eligible technology	Eligible sizes	Tariff rate (pence/kWh)	Tariff duration (years)
Small biomass	Solid biomass: Municipal solid waste (inc CHP)	Less than 200kWh	7.6	20
Medium biomass	"	200kWh and above, less than 100 kWh	4.7	20
Large biomass	"	1000kWh and above	2.6	20
Small ground source	Greound source heat pumps, water source heat pumps, deep geothermal	Less than 100 kWh	4.3	20
Large ground source	"	100 kWh and above	3.0	20
Solar thermal	Solar thermal	Less than 200 kWh	8.5	20
Biomethane	Biomethane injection and biogas combustion, except from landfill	Biomethane all scales, biogas combustion less than 200kWh	6.5	20

(Source: DECC)

Green for go?

Andy Gribble, Plumbase managing director, asks is the British public is ready for the Green Deal?

New launch: Andy Gribble, Plumbase. The company is launching the Ecobase initiative to help installers with the Green Deal

Although the public is somewhat familiar with solar panels and wind farms, the topic of energy saving solutions is still a minefield for the consumer. At present, the terms Green Deal and Renewable Heat Incentive do not mean a lot to most people and education is key if the government's introduction of these new schemes is to succeed.

However, a society knowledgeable in benefits of renewables and energy saving solutions is a little way off. The most important thing at present is that installers are prepared.

As we await the implementation of the Green Deal, legislation continues to change. This, and the introduction of new technology as a result, causes confusion. But from this emerge vast commercial opportunities.

At Plumbase we want to ensure that our customers are ready to embrace new challenges and are confident to sell and install new technologies. An in-depth understanding of the technology is imperative for when the Green Deal is implemented, as the introduction of incentive schemes will increase demand.

To support this, Plumbase is launching a dedicated brand, Ecobase. Aimed at installers and consumers, Ecobase showrooms provide whole house energy saving solutions.

These centres of excellence will not only serve as educational areas for our installer customers but also as a destination for their clients, the home owner. Ecobase staff will provide impartial advice on the latest technology available, also demonstrating working technologies, such as solar PV panels, solar hot water systems, heat pumps and underfloor heating. In addition, with the introduction of training schemes and regular product updates, Ecobase will assist installers in getting more from their business.

As a company, Plumbase is prepared for the shift in legislation. It is part of Grafton Group, a Green Deal provider. We will offer a range of Green Deal-approved products and financial solutions. Additionally, can support with the training required to meet the MCS standard.

By working together we aim to create a network of knowledgeable installers ready to utilise the offering that the Green Deal presents. This group will then take this knowledge to the consumer, educating them in the benefits of energy saving solutions and readying them for the Green Deal.

Growth technology

With the PV market slowing down in the UK, **Jon Mussell**, Power Nation, explains how installers are taking a much-needed step further into renewables

Make the move: John Mussell, Power Nation, says the company has seen many PV installers move into solar thermal

With the once-buoyant PV market continuing to suffer from decreased and likely further decreasing, government incentives as well as an increasing lack of confidence from the end-user, it is unfortunate that some installers have made their exit from the renewables industry. Those who have jumped the gun and turned their back on the industry may well have missed the opportunity for growth that has, as we believe, begun its insurgence in the solar thermal market.

Despite the unfortunate exit of some installers, at Power Nation, we have witnessed a very positive trend of installers now actively expanding their portfolios and pursuing further opportunities within the renewables sector and in particular solar thermal, rather than retreating back to more traditional trade industries.

This is a very positive sign, and at Power Nation we have seen many PV installers move into solar thermal and in some cases choose to specialise in particular areas of solar thermal installations. We have seen a huge growth in the number of installers now focusing on pool systems, as it provides an easily calculated return on investment, as was the case with PV. Swimming pool systems tend to use gas or oil which generates substantial running costs for the user, whereas a thermal system will reduce heating load and energy consumption and even recirculate any excess heat generated to a cylinder or towel rail, making this a logical sell for the installer.

As a trade-focused wholesaler, at Power Nation we have a responsibility to ensure that we work with installers as they move towards thermal, offering straight-forward yet comprehensive technical advice as well as energy yield reports and full system schematics to ensure that installers are prepared by taking the time and investing in gaining the required thermal MCS accreditation, pursuing the opportunities in solar thermal and expanding further into the renewables market, installers can capitalise on a market that has remained largely untapped, rather than shy away entirely. With more installers expanding their offering, this is a positive and essential development for the growth of the renewables market, which will ultimately pay dividends.

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Play Fair

Fair Energy's **Finian Parrick**, looks at some of the issues affecting customers installing district heating systems, with the Renewable Heat Incentive in mind

The commercial Renewable Heat Incentive (RHI) is well underway and although figures released in May were not awe-inspiring, with 56 biomass boilers and a small number of ground source heat pumps approved in England, Scotland and Wales, it's a positive step forward.

To me, what's of concern at the moment is the continuing lack of understanding about heat loss in the ground. Boiler efficiency might be 90 per cent but in actual fact it is only achieving 65 – 70 per cent or even lower with these heat losses. Most people talk about losing only 1°C for every 100 metres of heat main but in fact you can lose 25 – 35 W/m² and this could equate to losing £1000 or even £2000-worth of heat into the ground!

Fair Energy uses boilers with a control system that facilitates individual building control. This enables the flow temperature to be kept at 55 – 60 °C as opposed to the usual 75 - 80°C, with the temperature only needing boosting when the cylinder needs charging. This means that heat loss into the ground is minimised and significant savings are also achieved.

Anyone applying for the RHI needs to understand that there are boxes to be ticked if the application is to be successful. For example, meters must be fitted to British Standards and be installed in the correct position in relation to other elements of the plant. And if the paperwork is not completely sorted out then the application can be returned.

Fair deal: Finian Parrick, md of Fair Energy, discusses heat loss issues

Invest for success?

With the new Feed-in Tariff rates confirmed, **Tony O'Connor**, BritishEco asks is PV still a good investment?

On Thursday 24 May, the Department of Energy and Climate Change (DECC) unveiled its plans for the future of the solar Feed-in Tariff (FiT), where it was confirmed that the tariff for <4kW domestic solar installations would change from 21p per kWh to 16p per kWh from 1 August 2012.

After mounting speculation in recent weeks regarding the depth and date of the cuts, the industry and consumers were finally given certainty about the changes to the FiT scheme. However, whilst the changes to the scheme will see the tariff reduce, the returns that solar can provide will in fact be hardly affected due to the falling costs of a solar PV system.

Tony O'Connor, managing director of BritishEco, says: "What many people don't realise is that, in line with the tariff reductions and scheme changes, the costs of solar are reducing dramatically. Coupled with rising energy prices, this means that the return on investment actually only marginally affected by the tariff changes."

O'Connor says the government has received strong criticism from the renewable energy industry over previous actions, with claims that changes to the scheme had damaged consumer confidence and slowed installation rates down significantly. Stating that re-educating consumers will be vital to reviving the industry, he explains: "Even with the new tariff reduction we expect to be able to offer domestic consumers up to 11 per cent return on investment. This is much higher than the return on most other investments, with the added bonus that solar is predictable and safe – once you've worked out your return; it is only likely to increase each year with higher energy prices."

Whilst many will be rushing to have solar installed before 1 August to avoid missing out on the higher tariff rate, in light of the generous returns that will still be available, it is likely that solar will continue to be the most popular way of supplying renewable electricity to a household in the coming years.


Buying power: Tony O'Connor, BritishEco, says PV is still a good investment

"I really admire people who invest in renewable energy and the future," Kevin Parslow, Evance Wind Turbines P30

Talking Ten to the Dozen

Leading renewable experts reveal their opinions

Q Do you think the UK is well placed to meets its 22GW PV target by 2020?

Kerry Burns, **Solarsense UK**

"If you'd asked in January, I'd have said yes. At current installation rates there is absolutely no way we'll meet that target. Stability is a word that ministers clearly don't understand. The domestic market needs urgent attention after being crippled in recent months."

Dr Shawn Qu, **Canadian Solar**

"Despite the recent UK FiT changes, the cost of solar continues to fall and as this happens it is becoming an increasingly attractive energy choice to homeowners and businesses alike. With the latest McKinsey report estimating that solar systems costs could fall by up to 70 per cent by 2020, we are confident that the UK can meet its installation target."

Paul Beaumont, **The House of Solar**

"The UK was doing very well with significant growth in solar power, but this has slowed badly and we are now in serious danger of not meeting the target. To succeed we need to install 200MW every month; March of this year saw only 64MW installed and April was a paltry 14MW. This is truly hopeless and shows that a major re-think is urgently required."

Simon Wood, **Megger**

"To say the UK is 'well placed' would be overly optimistic, but if the question is whether meeting the target is possible, the answer is, yes. Success depends on genuine government commitment and support, with no repeat of the Feed-in Tariff shenanigans, which greatly damaged the confidence of potential investors in PV systems."

Pippa Wibberley, **Glow-worm**

"The market is well placed to install quality PV systems and despite recent government cuts to tariffs, PV still offers a reasonable incentive to homeowners. The challenge now is for the government to focus on and work harder to invest in more attractive schemes for solar thermal."

Sam Tilley, **Infinite Energy**

"With the recent heavy cuts and requirements of the EPC Level D to install solar, coupled with the impending cuts, when the industry is already struggling, many customers are put off investing in solar. 22GW of solar would mean 2.6GW a year for the next eight years which is way beyond our predictions. More incentives for installing solar are required."

Sam Waxman, **Waxman Renewables**

"The only way the target can be met is to continue incentivising and educating the commercial and domestic markets. It is essential that incentives remain clear and stable to ensure the public has confidence and a level of trust to invest in the product."

Ben Hill, **Trina Solar**

"With improving technologies, decreasing costs, and reforms to the Feed-in Tariff scheme, the 2020 targets may not be as fanciful a pipe dream as many once thought. I believe the solar industry in the UK is going to continue to grow, proving solar to be an economical and sustainable source of energy."

Andy Boroughs, **Organic Energy**

"No chance. The 22GW figure was put forward last summer, when uptake was growing rapidly and before the FiTs reductions. This target should have been set to 2050 like most others. This avoids embarrassment to those who set them no doubt in the hope that our children and grandchildren can sort out the mess."

John Wade, **A Shade Greener**

"The industry now needs a period of prolonged stability, free from changes by the government. The current tariff levels will allow the industry to grow steadily, but only if there are no further changes. Foreign and domestic manufactures need to again see the UK PV Industry as a stable place to do business."

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Opinion

Two minutes with . . .

Who are you?
Kevin Parslow

What do you do?
I am CEO of Evance Wind Turbines. We design and manufacture our 5kW small wind turbines in the UK – 75 per cent of our components are also sourced in the UK.

Where are you?
Evance is based in Loughborough, Leicestershire.

How's business at the moment?
Last year was a remarkable year for us. We saw sales grow by over 200 per cent and we also expanded our workforce a quarter. It's a great testimony to our team that the R9000 turbine accounted for a third of all small wind turbines sold in the UK last year. Also we installed our 1000th turbine in March this year.

How could it be better?
We'd like to grow further and extend our export sales – currently 20 per cent – in key US, European and Asian markets through 2012 and beyond. I believe small wind turbines have an important contribution to make to the renewable energy targets and the true impact has yet to be realised.

Who do you admire in renewables?
I really admire people who invest in renewable energy and the future. There are many home owners and businesses that are benefitting from 'small wind'.

What's the best business advice you have received?
Basically customer service is key. To build a successful business you need to define your market, focus on objectives and deliver on your promises.

How are you going green?
As a business we already use wood from sustainable forests for packaging and recycle as much as possible - we are now working towards ISO 14001. Also our turbine towers have been designed for the foundations to require minimal concrete and steel.
On a personal level I'm part of the Evance team that works to influence renewable energy policy by lobbying ministers and DECC.

Q&A

Phil Old

Seaward Solar

REI: What have you got planned for the rest of the year?
PO: We will continue to develop and introduce specialist solar PV test instrumentation and all-in-one test kits – with new technology solutions. These are designed to give installers a fast and efficient solution to meeting the test and measurement requirements of MCS MIS3002 and to ensure the safety and performance standards of PV systems.

REI: What do you see as the growth areas in renewables?
PO: Solar installations have clearly been highly affected by the government changes to the Feed-in Tariff (FiT) and this will continue to be a major factor when decisions are made on future changes. Nevertheless, the government still has ambitious targets for renewable energy in the UK (22GW by 2020) and installation figures show that, even when the market is regarded as slow, it is far from flat. Seaward Solar is an international business and is also pursuing growing market opportunities for its test instrumentation in many other countries.

REI: How is your company cutting its carbon footprint?
PO: Seaward has introduced environmental policies to reduce CO2 emissions by 60 per cent - and work is continuing to cut the figure further. We have switched energy supply to a zero carbon supplier, set-up waste management and recycling, timers are used on all factory switches and appliances and lighting system improvements have been made.

Phil Old is PV applications engineer, Seaward Solar

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- It has been independently tested and proven to make significant carbon, energy and money savings.
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Solar PV + VPhase

There's a growing trend for solar PV installers to specify VPhase voltage optimisation devices, as they're not only a low cost, effective technology that can improve the overall payback period for the combined job - but they're also increasingly in demand from consumers. As an electrician is usually on site for a PV installation, the extra time and cost for adding in a VPhase is negligible.

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VPhase has put together a unique training video with in-house, time-served electrician Andy Rigby and the Learning Lounge's Dave Austin. The video, at just over 22 minutes long makes learning about voltage optimisation and how to install the VPhase device easy and convenient, as you can watch it whenever, wherever and as often as you like. Alternatively, go to www.youtube.com/vphase and watch it there.

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Safety first

Steve Pester, BRE, discusses the issues surrounding DC isolators

Stay safe: Steve Pester, BRE speaks about the possible dangers of DC isolators

BRE was recently sent an example of a DC isolator (switch) which had filled up a room with smoke in a few seconds. It burnt through the side of the enclosure before it could be disconnected. Luckily, in this case, the solar engineer was on hand to deal with this dangerous situation but there's no need to spell out the potential consequences for life, property and the reputation of the solar industry from such incidents.

The cause? Almost certainly an incorrectly specified isolator. All installers will know that DC is much more dangerous than AC and requires special components. You may think, therefore, that it's a clear-cut case of the installer not doing their homework, or deliberately using a cheaper AC switch instead of a DC type but that is not necessarily true. We have been made aware of a worrying practice whereby one or two manufacturers are 'redefining' isolators originally designed for AC use as suitable for DC, with or without minor modifications. Occasionally, distributors have incorrectly advised installers on this issue as well. The advice ranges from using a 'rapid action' when turning the switch to wiring two poles in series in order to increase the switch gap in the 'off' position. If you hear this kind of thing, be suspicious! Purpose-designed DC isolators will rapidly suppress switching arcs and are of a different design from AC types.

All installers know that DC is much more dangerous than AC and requires special components

MCS requires installers to use DC-rated components for all DC functions, but the MCS product scheme does not currently certify isolators. So as an installer, how can be sure you are using a safe device if you cannot rely on data sheets or advice from suppliers? The best option is to ask the supplier or manufacturer to provide a copy of the test certificate from an independent, accredited, test laboratory, which shows the device to be DC-rated. This is also the best way to check that it is rated for the voltage and current, allowing for the safety factors specified in the MCS PV installer's guide (currently the DTI guide ed. 2, shortly to be replaced with an updated MCS guide).

MCS requires installers to use DC rated components for all DC functions but the MCS product scheme does not currently certify isolators

Pollard's Patter

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

We've all been buried in the detail of FiTs, RHI and the Green Deal, so I thought it would be useful to point out how a couple of recent news stories could affect the renewables market.

First, was the news that RWE Npower and E.On, have decided not to develop UK nuclear power projects. This follows Scottish and Southern Energy's decision to pull out of a deal to develop a new nuclear power station. A subsequent report in The Times stated that French nuclear developer, EDF, had raised the cost of building a nuclear power plant to £7 billion from £4.5 billion. This, coupled with the French election result, could compromise their nuclear development plans. Without a solution, then the UK energy strategy to phase out fossil fuel power plants and concentrate on nuclear and renewable energy sources, would be under threat.

Secondly, reports from energy analysts recognised that, due to Japanese withdrawal from nuclear generation, they were aggressively purchasing LPG, causing wholesale gas price increases of up to 28%. Since over 80% of UK homes are gas heated, such an increase may cause further interest in alternatives. And, as the requirement to replace our ageing power stations is becoming critical and the short-term solution is likely to rely heavily on the provision of gas-fired stations, this is likely to become exacerbated.

Whatever the outcomes of these situations, it is vital that energy efficiency remains at the top of the agenda.

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Double up

Solfex Energy Systems has installed commercial PV and solar thermal systems in sheltered accommodation in Lancaster, with highly positive results

Bright idea: Thanks to the solar expertise of Solfex, residents at Derwent Court, are benefitting from the results

Solfex Energy Systems, working in partnership with North West-based installation company Herbert T Forrest, Johnnie Johnson Housing and Preston Lee Chambers, has embarked on an ambitious project to supply and install a large commercial PV system and also a large commercial solar thermal hot water system on Derwent Court, a sheltered accommodation block in Lancaster, Lancashire.

For the solar thermal hot water system the original hot water plant was to be retained and an 800 litre unvented pre-heat storage cylinder was installed pre-feeding the existing ACV unit.

18M² of Solfex Energy Systems' CPC INOX vacuum tube collectors were installed on the south-facing elevation, in total, up to 30 per cent of the annual domestic hot water requirement of the entire sheltered accommodation block will be covered by the solar thermal system with CO2 savings of 2,249.83 kg.

According to Solfex, RHI income from the solar thermal system will result in payments of around £665.60 per year.

The controller for the solar thermal system is the new Prozeda Primos 600 with in-built data logging and also optional Connexio 600 webmodule, for full online visualisation of the solar thermal system including solar thermal controller parameter remote control access.

Property Type: Sheltered accommodation block
Client: Herbert T Forrest & Johnnie Johnson Housing
Consulting Engineer: Preston Lee Chambers
Property Location: Lancaster, Lancashire
Roof Orientation: South

Solar thermal system
Collector Type: Solfex Energy Systems' CPC INOX vacuum tube collector
Gross Collector Area: 18 M²
Solar Storage type & Volume: 800Litre pre-heat cylinder
Solar Thermal system objective: Domestic Hot Water only.
Domestic Hot water annual coverage: up to 30% / 8.32MWh

PV system
Module Type : Kioto Photovoltaic 205wp poly
PV system size: 35.8KW
Inverter Type : Power-One
Mounting System Type: Solfex Energy Systems' Alpha on-roof
Generation per annum: 33523 KwH

The PV system

High quality European manufactured modules from the Austrian manufacturer Kioto Photovoltaics were used for their price / performance ratio. Due to roof space constraints two separate south-facing arrays were installed on Solfex on-roof Alpha mounting system.

Dual MPPT inverters from global player Power-One were selected due to the long warranty conditions and performance. It is expected that the PV system will generate in excess of 33523 Kwh per annum.

Simon Wardle, national sales manager / solar thermal products commented: "This was a great project to be involved with which combined both solar thermal and PV technologies. We have great experience in larger-scale solar thermal systems and we have completed several sheltered accommodation blocks over the last 12 months. Hopefully with the RHI this will be the start of things to come."

Sally-Anne Smith, marketing and communications manager, Herbert T Forrest commented: "Forrest prides itself on delivering the highest quality service and value to clients. Bringing knowledge, expertise and a wide range of quality products to the table, we were able to work collaboratively to devise a best value solution for Johnnie Johnson and its residents.

"The success of the Derwent Court Project is testament to that collaborative approach and we look forward to working alongside Solfex Energy Systems on future projects," she said.

Saving the family joules

Paul Stewart, managing director, Air Source Hot Water, re-examines the issues surrounding conventional air source heat pumps. We would love to know the what the heat pump community thinks about this. Get in touch and let us know

Almost every household in the UK uses hot water. For ease of example, let's assume water arrives at a temperature of 6°C. Energy is then used to raise this up to around 60°C - for showers, baths, and central heating.

Let's assume that this family uses 400 litres of hot water per day. Just how much energy is used and how it is calculated to increase the temperature of 400 litres of water by the required 54°C? (4.187 joules x 400 litres x 54°C)/3.6 = 25.12Kw/hrs. Kw/hrs is the unit we see on our bills - so we can turn this into MONEY!

If your kitchen and bathroom are full of warm air, why not take your air anergy from this source FIRST, before scraping around in the cold outside?

Based on 15p per unit for an electricity bill, this works out to be £3.77 per day - or £1,376.06 per annum. Who would have thought that family joules would be so valuable?

What people do with this valuable energy next is quite amazing – they install extractor fans in the bathroom and kitchen and physically throw it away. Much of the warmth in the water from the sinks, showers and baths also goes down the drain.

Renewables experts will often suggest buying an air source heat pump - which sits outside in the cold, and has to work hard to heat all that water from 6°C to 60°C.

I like heat pumps, but let's apply some logic. If your kitchen and bathroom are full of warm air, why not take your air energy from this source FIRST, before scraping around in the cold outside?

How about something like this instead: Install a hot water cylinder that has an air source heat pump built into it. They could use this to recycle the warm air from their bathroom and kitchen. Then they could run all of the household wastewater through a unit that extracts the valuable heat energy - taking the precious commodity back to the water tank. But how much would be saved?

To begin with, the water would not start at 6°C - the recycled energy from the waste-water would see to that. The starting point might be as high as 18°C.

So, instead of raising the water temperature by 54°C, there is only a need to top up the temperature by 42°C.

Using the same formula as before: (4.187 joules x 400 litres x 42°C)/3.6 = 19.54Kw/hrs.

Next, the air source heat pump located inside the house is heating the water (not the normal boiler). It does this by recycling the warm air, and does it with an energy efficiency ratio of something like 3.8.

What this means is that for every 1 unit of energy it uses, there will be 3.8 units of energy added to the water.

If we need 19.54Kw/hrs, the system itself will only use (19.54/3.8) = 5.14Kw/hrs to get the job done.

This takes the final bill down to 5.14 (energy needed) x 15p (cost per unit) = 77.1p per day.

An annual bill reduction from £1,376.06 down to £281.42 – with nothing more than a new hot water cylinder and a small waste water system.

Then we come to financial advisers - how would they view the numbers?

Air Source Hot Water managing director, Paul Stewart, says household hot water bills could be reduced by over £1,000 per annum by recycling heat usually thrown away

Then we come to financial advisers - how they would view the numbers?

The £1,094.64 annual saving on fuel would increase each year, to take into account annual increases in fuel costs.

If the total installation costs for such a system came to around £5,000, this would mean that the returns would be way higher than almost any other investment or ISA on offer.

21.9 per cent is quite a good yield in anyone's books. £1,094.64 saved today might work out to be £1,780 in 10 years time… or even £2,000 in 15 years. Who knows?

What's your take on Stewart's thinking? Email **lu@andpublishing.co.uk**

Intelligent thinking

Bob Long, a thermo-dynamics, heating and refrigeration engineer with 35 years experience, outlines the benefits of Eco Innovate's Intelligent Temperature Trimmer

Nowadays, arguments to reduce our carbon emissions are all around us. Information and technology need to be more user-friendly, reliable, produce a repeatable result and require available skills to install.

With this in mind, Eco Innovate has developed products to get the best out of eco heating systems, including heat pumps, solar thermal, log burners and pellet stoves. The Intelligent Temperature Trimmer (ITT) has intelligent electronic circuitry and controls water temperatures with accuracy and with the minimum amount of input energy. For economic operation, a heat pump needs to be sized as close to the heating requirement as possible. The ITT aims to guarantee size matches every time.

Recent DECC legislation for MCS installers states that heat pumps need to deliver 100 per cent of the required energy at a minimum climatic temperature of -2deg C. Below this temperature there will be problems unless supplementary energy is added.

Many heat pump manufacturers incorporate an electrical heater to provide climatic compensation. This is often induced by an ambient thermostat reading the outdoor temperature and responding through an immersion-style heater within the system.

The amount of supplementary raw energy is often excessive. The ITT calculates the amount of energy required and in doing so makes sure that all of the low-cost energy provided by the heat pump is used first and only a small supplementary amount of high cost electrical energy is used to balance the heat output with the heat requirement.

Meeting point: Bob Long ,Eco Innovate, talks to Ed Davey, energy and climate change secretary

Elementary, Wattson

The Wattson Professional energy monitoring system is the latest product included in Energeno's portfolio.

According to the company, the web-based system will enable installers to provide a value-added maintenance package to customers through its remote service.

The Professional operates through 'cloud computing' which means that businesses or householders can have access to energy usage and generation data from most internet-enabled devices. Installers can also specify other preferred delivery methods such as SMS or email when setting up automatically generated alerts.

Energeno's director of operations, Mark Elliott, added: "It uses the latest technology to ensure that installations are working at their most efficient and assures customers that they are getting the most out of their investment.

"The Professional provides a profitable ongoing maintenance and support package which will give end-users real piece of mind."

Cloud nine: The Wattson Professional utilises 'cloud computing' to provide data to a host of internet-enabled devices

Secon secures Wattsure monitor

Secon Solar says it is now the sole distributor of the Wattsure monitoring system for solar thermal systems.

It adds that when using a Wattsure box, it is possible to easily connect to RESOL solar controllers using the VBus interface and then monitor output, efficiency and history through a website hosted by Wattsure.

According to Secon, the largest system presently using a Wattsure monitoring system has 43 inverters running. The Wattsure website is designed to give a graphical view of the system and will alert the owner via email if there is any drop in performance.

Paul Hind, Secon's technical manager, said: "The Wattsure system is very easy to install. It is suitable for any size of installation from small domestic to large commercial and is perfect for educational establishments. Live data can be viewed from anywhere in the world if you can access the internet."

Nice figures: The Wattsure monitor aims to provide the owner with performance data via email

Save money with iVolt

Slough-based IVolt has launched a voltage reduction solution that it claims increases the lifespan of electrical equipment by regulating voltage output. It also monitors how much energy it is saving in real time too.

IVolt's Intelligent Real Time Energy Measurement technology (patent pending) is included in all of iVolt's units to help customers keep track of their energy usage, running costs and CO2 output.

The company adds that by using in-built electronic circuits and sophisticated software algorithms, the device adjusts the output voltage to compare energy consumption, with and without optimisation, over a defined period to identify the difference. The data can be downloaded by connecting a laptop via a USB or even transmitted via an optional communications module for use in remote building energy management systems.

Richard Brown, chief engineer at iVolt, said: "While other voltage optimisation systems collect data over a course of several months and rely on theoretical 'modelling' assumptions, our software lets customers know exactly where they are. Typically customers are seeing returns of 12 per cent which is around a third more than our competitors."

Smart idea: Each iVolt unit comes with patent-pending real time energy management technology

Advantage installers

Are you using the energy performance recommendations within the required Energy Performance Certificate (EPC) to your advantage? **James Dodd**, the National EPC Company, offers some advice to installers

Since 1 April 1, installers of solar PV systems have been getting used to the role of the EPC in the Feed-in Tariff application. But not all installers have been maximizing the potential of the up-selling opportunity which is presented with the EPC certificate. Customers are obviously keen to start generating their own energy and claiming the FiT. However, with a bit of understanding as to how the energy is lost within the property, and what improved measures could be applied, the installer has an opportunity to up-sell other products by using the predicted savings results within the EPC. Simple measures such as loft and cavity wall insulation can be outsourced with the potential for referral income but products which can been installed while the solar installer is on site make a lot of sense and keep the price competitive as they are already at the property. For example, while the mains electricity is isolated, a voltage optimization unit could be installed, room thermostats and boiler controls can be installed or updated along with changing light fittings to the most energy efficient.

The National EPC Company (Nepcco) FiT EPC product has been a great success for installers enabling them to ascertain before installation what the EPC banding will be with and without the specified solar array installed. It gives them the data to discuss and up-sell energy saving options with the customer.

Nepcco is finding that 90 per cent of EPCs are getting to the required D rating with the solar panel array included. However, when customers see what measures could be installed at the same time as the microgeneration system, they are more likely to get some of the improved measures carried out at the same time to limit disruption.

Typically only one visit is required to the property by the energy assessor to provide the FiT EPC. However, if the property requires upgrades to reach a D, proof that works have been carried out by a recognised installer are required to enable the updated EPC results to be logged on the national register.

It is also important to get the EPC logged as quickly as possible in order to avoid delays in MCS applications. We have a service level agreement with our clients that states EPCs will be lodged and delivered within 24 hours of our clients uploading the MCS certificate onto our online work management system, clients need to know we are focused on this and will deliver the EPC in this timeframe.

We also work on the EPC calculation in draft format before actually lodging the EPC in order avoid delays and additional costs for our clients, it is important that clients provide accurate information on the specification of the panel design proposed. If the design or make of panels is changed at any stage it is important that we are advised so we can recalculate the EPC to ensure the required banding is reached. We will only lodge the EPC once the MCS certificate and other installation certificates have been provided confirming the size of the system installed.

The commercial PV market poses an additional challenge in that not all property is required to have an EPC, in these circumstances a qualified commercial energy assessor visits the site and provides an Exemption Letter that the installer can use as part of their MCS application.

Green Deal

The Green Deal will bring additional opportunities for installers as the assessment can be used to ascertain if energy efficiency upgrades are required at the property,. If they fall within the Green Deal recommendations financing can then be proposed which will see the cost of the upgrades and possibly part of the PV Installation costs being paid for by Green Deal funding. The repayments for this would go on the home owners energy bill, however, the Golden Rule within the Green Deal means that the savings brought about by the installed measures will be more than the cost of the Green Deal loan.

Nepcco is finding that 90 per cent of EPCs are getting to the required D rating with the solar panel array included

On the up: According to James Dodd, the National EPC Company, EPCS offer up-selling opportunities for installers

The Green Deal will see the homeowner benefit from energy efficiency upgrades alongside their solar PV Installation and the PV Installer benefit from diversification of the services they offer to clients.

The National EPC Company will be providing installers with a service to pass Green Deal projects. We manage the delivery of a Green Deal advice report and provide a service where we can pull together the funding element through a Green Deal Provider and manage the installation of any measures to be installed (if not supplied by the original installer). It is also possible that a commission would also be payable back to the referring installer for any measures not installed by them.

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PV - the light shines bright

Despite the reduction of the Feed-in Tariff and the shortening of the lifetime of the tariff by five years, there is still reason for SMEs to feel upbeat about solar PV. **Simon Allan**, Plumb Center's director of renewables, explains

In May, DECC announced that it is making changes to the Feed-in Tariff (FiT) scheme which, it believes, will give a much-needed boost to the solar industry.

Some within the solar industry are unsure if the changes, which come into effect as of 1 August, represent what has been described by Greg Barker as a 'new and exciting chapter'. They question whether an industry that has experienced such an uncertain 18 months is able to accommodate the changes, which include the reduction of the FiT lifetime of new solar installations from 25 to 20 years, and the tariff cut to 16p - a reflection of the reduced costs of solar. Plus, the tariff could be reduced further in three-monthly intervals.

However, despite this initial concern there are still reasons for SMEs to feel upbeat about the future of solar PV. One of the most significant developments for small businesses is that solar panels are due to be added to the UK's Renewable Energy Roadmap - the action plan designed to speed up the way we best position and use renewable energy on the road to meeting our 2020 emissions reduction target.

This demonstrates that the government recognises the major role solar PV has to play in the future of renewable technology, alongside other methods like biomass, heat pumps, marine energy, on and offshore wind, and renewable transport - which were already on the roadmap.

The government is reinforcing its commitment with the launch of a solar PV cost reduction taskforce in partnership with industry to help drive down costs while maintaining safety and standards. It will help shape the kind of solar industrial policy needed to meet the UK's target of generating 22GW of solar electricity by 2020.

Still shining: According to Simon Allan, Plumb Center, PV is still good news for SMEs

Sun still shines on PV

Despite the recent Feed-in Tariff changes, **Chris Hopkins**, Ploughcroft recommends a positive approach to PV

Renewable energy installers have learned to expect the unexpected over the past eight months. The government has certainly not made life easy for the industry and it is little wonder that this has caused frustration amongst installers. DECC recently announced that the proposed changes to the Feed-in Tariff (FiT) expected for 1 July are being delayed until 1 August. Although we had hoped that the government would hold the current FiT rate for 12 months, after it announced the July delay, this latest announcement does provide greater clarity for both the solar industry and homeowners.

Since the FiT cut at the end of March, the solar PV industry has suffered a major downturn in business, with many companies seeing up to 90 per cent reduction in sales. Many are diversifying into other renewable technologies in order to reap new opportunities and reduce their reliance on solar PV. Within the next few months it is expected that even more solar PV companies will exit the market.

Now the FiT changes have been confirmed, this finally provides grounds for stability. The solar PV businesses left will be the ones who all along had a good business model, who will find they are operating in a more competitive and challenging market, but also one with many exciting opportunities.

I have said many times that the cut from 43.3p to 21p per kWh was necessary to enable a greater number of consumers to benefit from solar, when a limited amount of government funding is available. Obviously it would have been better for the industry to retain the 21p rate for a 4kW system, but the 16p rate still means over six per cent returns can be expected by homeowners – which far exceeds most bank interest rates. And with manufacturing costs having fallen radically of late, solar PV offers a much quicker payback than it did when the FiT was first launched. Solar PV installers need to remain positive and promote the benefits to customers, such as the export tariff increase from 3.1p to 4.5p, which will help homeowners maximise their return on investment.

PV pays: Chris Hopkins, Ploughcroft. There are still many reasons for PV to be a good investment, he says

Obviously, the news that the tariff will decrease on a three-month basis by 3.5 per cent after August is an ongoing challenge for the industry, but as electricity prices continue to rise and consumers become conscious of their carbon footprint, I believe that solar PV will still be attractive to many consumers in the long term.

A bright future

Cathy Debenham, YouGen highlights the opportunities to be had in PV and maybe installers should re-think their target audience and marketing message?

At last, we have a clear, transparent plan for the future of the solar PV market. The numbers might not be to everyone's taste, but the framework looks solid and sensible. Best of all, it's out of the hands of politicians: Tariff decisions are going to be based on deployment rates, and announced at pre set times, and if deployment is lower than expected, the planned decreases will not happen.

This seems like the right time for the solar trade to put all the hurt, chaos and instability of the past year behind it and focus on looking forwards. With the generation rate for solar PV reducing to 16p, and rates of return down to 6.3 per cent (DECC's figures for systems of 4kW and below from 1 August) it's important to shift the focus from scrapping with the government to building customer confidence.

In future, solar PV is likely to be a more subtle sell. It's not just about the money any more. In fact, Consumer Focus' research Keeping FIT published last year indicates that it never was just about the money. When asked about which factors prompted interest in renewable technologies 25 per cent of those at installation stage said it's a good investment opportunity compared with 63 per cent who cited the rising price of fuel; 58 per cent who said environmental concerns; and 46 per cent who wanted to be self-sufficient.

Previously domestic customers have been the bread and butter for many installers. However, small and medium sized businesses are also very concerned about their energy bills, and can often benefit more as they have higher daytime electricity use. Farmers (who really understand subsidies and how to benefit from them) have led the way, and a startling one in six have installed solar PV according to research by the NFU. There's a huge potential market out there. But there's also a lot of ignorance and misinformation. Time for a strong, consistent public education campaign about the benefits of solar PV, perhaps.

In the know: YouGen's Cathy Debenham says there's a huge potential PV market out there

Business opportunities

SMEs can negate risks by installing solar panels – potentially halving total energy costs, says **Dr Christian Jardine** of Joju Solar

Rising energy prices in the UK are set to present small to medium-sized businesses with an extra headache as they strive to control costs in a difficult business climate.

SME's energy bills have shot up by more than 25 per cent over the last four years, according to research by Datamonitor Energy, and are expected to continue rising sharply over the next decade.

"As businesses grapple with rising costs, the sharp rises in energy prices over the next few years could be the final straw for many small business owners," says Dr. Christian Jardine, technical director, Joju Solar.

Almost half of Britain's electricity is generated by burning gas, and the UK's increasing reliance on gas imports to fuel its generating capacity has placed an upward pressure on electricity prices. The UK competes for gas imports with other large markets that are also increasing their gas consumption.

"Britain's rising gas import bill is creating an additional burden for many businesses, particularly those with a lot of set energy costs, and the next couple of years could see significant rises in energy bills which could be extremely challenging for many companies in an already difficult market," Dr. Jardine adds.

But there is a solution to this looming crisis. Businesses that install solar panels can potentially halve their total energy bills, diversify their business, hedge against future electricity price hikes, and help comply with government carbon reduction commitments.

The cost of installing PV systems at commercial premises is now cheaper and more cost-effective than it has ever been.

The cost of many leading brands of solar panels plummeted by more than 50 per cent over the last two years because of ever-increasing competition and a reduction in the price of bulk silicon in the commodities markets.

Meanwhile, improvements to installation technology have drastically reduced the time required to fit solar panels onto a premises' roof – further driving down overall costs.

"The average cost of a large commercial solar installation is less than half the price it was two years ago," Dr. Jardine says.

Money talks: Installers Joju Solar says the cost of installing PV systems at commercial premises is now cheaper and more cost-effective than it has ever been

"The economic arguments in favour of solar as an alternative to traditional methods of energy generation are becoming more apparent every year. The cost of PV installation and the prices of solar panels have fallen sharply while rises in traditional carbon-based energy prices put more and more pressure on businesses."

The next three months, in particular, represent a golden opportunity for businesses with possible returns of more than 10 per cent on investments on the back of huge savings on a company's monthly energy bills.

Further cuts to the Feed-in-Tariff (FiT) are expected at six-monthly intervals. But as solar installation becomes cheaper and more cost-effective, the industry will increasingly be able to rely on market forces to convince future customers.

"To secure the long-term future of your business in the face of rising energy bills now is the time to switch to solar," Dr. Jardine adds. "It makes total economic sense."

Setting the standard

Dimplex Renewables is offering a ten year warranty on its solar panels plus additional certification for salt mist and ammonia. The warranty on all Dimplex solar modules is coupled with a 25 year performance guarantee.

Dimplex adds that although a PV system should be maintenance-free for many years as it has no moving parts, this new warranty gives peace of mind that the panels will last and require little or no maintenance for the life of the system.

No limit: Dimplex says its new warranty will protect panels no matter where they are installed

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Safe as houses

Dr Shawn Qu, ceo of Canadian Solar, looks at effective protection against the theft of solar systems

Safe and secure: Dr Shawn Qu, Canadian Solar outlines the need for PV security

Installing a PV system onto a property or plot of land can be a costly business for your customers, both in terms of the cost of the modules and fees, plus investment into insurance and financing. After considerable expenditure, the last thing a customer wants is to wake up one morning to find that their solar modules have been stolen. Unfortunately however, as solar modules and PV systems on roofs and in solar parks become ever more sophisticated and expensive, their attractiveness to thieves is growing.

Luckily, there are now a variety of simple yet effective methods, recommended by police and experts, which installers can share to help owners protect their modules against theft.

While it is imperative that anyone who is operating PV plants takes effective measures to protect against theft, the good news is that these measures need not break the bank. For those of you who have to advise your customers on this issue, there are options available for rooftop PV systems which require little investment in terms of costs and yet will still offer effective protect against theft.

However, unlike with rooftop systems, the protection of other types of solar module - like assembly mounted solar modules and modules which are installed on plants or domestic buildings outside of densely populated residential areas - can prove significantly more complicated. Simple tips to protect against theft can include tensile wire and acoustic signals and further deterrents range from additional surveillance cameras and dummy wall-mounted cameras to sophisticated systems such as motion detectors, with lighting and video recording.

Protection at installation and mounting stage

In the UK most solar modules should have some theft precautions and anti-theft devices installed during the assembly process, something that installers should be aware of when choosing their module supplier. Some effective ways which particularly impact the time in which it would take to steal a module include:

- Mechanically coded bolts or screws with one-way drives
- Adding small balls to sockets
  * Following the mounting of the module small balls are driven into the hexagonal socket of the screws. This will mean that the screws can no longer be undone with a regular key and instead require a specialist to be called in
- Over-torqued Hex
  * Once assembled, the edges of the hexagon are rounded off. The screws can then no longer be undone with normal keys. Any faulty modules must be replaced, and professional help needs to be called in
- Headless screws
  * The special screw is tightened with a torque wrench and the head of the screw is detached at a certain torque. Disassembly in this case is difficult - even for the operators themselves
- Screws with a specially designed cross slot
  * The special design of the cross slot means that it can only be screwed and unscrewed by a customised bit, turning the screw counter-clockwise for example is not possible - the key will simply slide out over the cross slot. To disassemble the bolt must be drilled
- Fill the assembled hexagon head bolt with resin. Once again this means that disassembly is only possible if the connection is completely destroyed

Mark your PV systems

The police recommend that owners mark PV systems to ensure easy identification and to make it as difficult as possible for thieves to resell. Often, the modules have been individually numbered by the manufacturers, however, this usually only comes in the form of easily removable stickers rather than engraved or stamped markings.

The police instead recommend that in addition to good anchorage, which should be the responsibility of the installer – ensuring it cannot be removed with conventional tools – installers should suggest fitting an alarm to monitor the system and permanently marking significant parts of the system with a code.

One such code that we recommend to our partner installers is an owner-identification number, composed of the following different components, which are hard to replicate and very personalised:

1. City or county identification of the vehicle license plate
2. Street name
3. House number
4. Initials of the owner

The marking should be made as clearly visible as possible and in an indelible format so that it cannot be easily removed. When marked in this way, any photovoltaic elements can immediately be linked back to their owner, even if the owner themselves has not noticed the theft yet. Moreover, the sale of such obviously stolen goods is much less attractive, conversely making solar modules a more attractive and reliable investment for your customers.

While implementing solar hugely helps the environment, the modules are increasingly valuable and unfortunately we are not able to stop thieves from trying to take what's not theirs. Though it is not the responsibility of an installer to guard against theft, the more help and information you can provide in the installation phase, the more likely it is that the modules will remain secure, ensuring continued positive sentiments towards to sector on the whole.

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Voltage optimisation – lighting up business for installers

Voltage optimisation (VO) can become part of a comprehensive PV package installers are able to provide. However, to maximise potential business opportunities, **Jonathan Davey**, business development manager for Apex Energy UK, says that installers need to understand the technology better

In simple terms, VO is an efficient way to control the DC voltage supply provided to a property by PV panels, leading to significant electrical power savings - up to 20 per cent in some cases. Nowadays, we are seeing VO systems coming in at a price level that makes them attractive for not only householders but social housing operators to embrace, opening up a whole new installation sector in the process.

Voltage optimisation is simply a case of supply and demand. UK electricity supply to most normal households is around 242 volts to comply with electricity supply regulations which state that supply should be 230 volts +/- 10 per cent (207V to 253V). All domestic appliances which feature the CE mark are designed to work within a voltage range of 207V to 253V but critically the optimum and most efficient supply voltage for these is 220V.

The extra power not used dissipates as heat and vibration within appliances, significantly increasing running costs and reducing by as much as 90 per cent of their operational lifespan. The introduction of a voltage optimiser like the Apex VO unit, which uses next generation transformer technology, acts as a 'buffer' between the mains feed and the domestic supply circuit to appliances, reducing the voltage down to 220V and in turn prolonging the life of equipment and reducing power bills.

The VO unit can be integrated as part of a PV system without the need for modifications to the existing distribution board. State-of-the-art safety features include a low voltage threshold (LVT) facility to ensure optimal voltage does not fall below a minimum level and a high current threshold (HCT) which automatically detects any over current. Should any of these conditions occur optimum switching threshold is incorporated which eliminates any interruption to the supply voltage.

The Apex unit features a dedicated Electronic Control Unit (ECU) that enables it to self-manage, checking mains supply and domestic electricity demand and reacting automatically to appliances being switched on/off. A number of variables from supply voltage and current through to ambient temperature and outgoing 'demand' are continuously monitored while the unit's own performance is routinely checked to ensure 'intelligent' voltage optimisation is in progress.

Maintenance free, quick-to-install and cost effective, the VO unit utilises next generation electronic technology to constantly ensure a secure, smooth and uninterrupted voltage and will even absorb any spikes and transients in the power supply

Unlike other VO units the Apex VO unit is simply installed between the main meter and the distribution board. This ensures that the voltage supplied to all the electrical appliances is optimised, immediately reducing costs and proving financially beneficial – for example, cost savings using the Apex can be between 8 and 20 per cent per annum and potentially £6,000 over 25 years*.

At the heart of each unit is an advanced electronic control unit (ECU) which uses 'intelligent' technology to constantly monitor and manage incoming and outgoing supply voltage, load and current to ensure electricity is being used as efficiently as possible. In built 'intelligence' ensures the unit automatically goes into standby mode if appliances are not being used such as when householders are on holiday. Furthermore, the unit protects sensitive electrical devices from damage caused by voltage surges and features a self monitoring, interactive display for ease-of-use.

VO might be a relatively new concept but it will only gain in popularity among renewable energy installers looking to add value for PV customers. The question is simple: Can you afford to ignore the opportunity?

*Assuming the average domestic electricity bill will increase by 5 per cent annually over the next 25 years, the Apex VO unit will achieve a total saving of up to £6,000 over this period and pay for itself in little over two years.

In the mix: According to Apex Energy UK, voltage optimisation can become part of a comprehensive PV package installers are able to provide

The S Factor

A PV installation that supports **BRE**'s S Plan sustainability initiative boasts comprehensive monitoring for real-time on-site display and an on-line web portal

As part of its wide-ranging sustainability strategy (The S Plan), BRE has completed the commissioning of a new roof-mounted photovoltaic (PV) solar array at its large research and office complex in Garston near Watford. Designed and installed by MCS-accredited PV specialist South Facing, the system has been installed to help reduce BRE's carbon footprint. BRE's S Plan sets out a four-year programme of continuous improvement across eight key areas of sustainability: Carbon dioxide emissions; resource efficiency; supply chain engagement; transport; community engagement; ecology; water; and information systems

South Facing secured the contract following a competitive tender. The specification of the project was finalised by design engineers at South Facing in close consultation with industry experts at BRE including the organisation's wind-loading and structural engineering specialists as well as BRE Ventures innovation director, Andrew Williams, and Steve Pester, a leading authority in photovoltaic technologies here in the UK.

"We selected a roof on one of our main office buildings for the new PV array and naturally we set our own stringent standards for the installation," explained Williams. "However, the roof construction provided quite a few challenges in terms of structural loading. We were keen to understand the practical issues that need to be addressed throughout any installation process in order to satisfy both PV system performance requirements as well as all relevant structural and wind loading considerations for the building type and construction method. We also required third party approval of any component used in the installation which meant that manufacturers' claims and product specifications could not be taken at face value."

The final installation consists of 128 high performance 230 Watt modules manufactured by Norwegian PV specialist REC and supplied by Chiswick-based Alternergy. These were chosen because of the company's good reputation, long product warranty, exceptional performance in European performance trials and the very low embodied carbon associated with the manufacture of the modules. Two SMA Tripower 15000 three phase inverters, also supplied by Alternergy, supply power to BRE's electrical distribution network on the ground floor of the building. The system is expected to generate in excess of 23,500kWh per annum.

Group shot: Standing among the roof mounted PV array at BRE are (l-r) South Facing's Clive Collison, BRE's Andrew Williams, Alternergy's Rajiv Bhatia, SMA's Paul Boylin and REC Solar's Pierre Cesbron

Significantly, and to provide a long-term research/educational tool, the installation also includes a monitoring system with all relevant system data fed to a desk-top display as well as to a real-time display in the BRE main reception and an on-line web portal. This uses sensors and dataloggers to monitor wind speed, air temperature, module temperature and solar radiance data so that useful research data is generated and optimal performance can be maintained throughout the system's lifetime.

The chosen building had a roof constructed from a cast in situ reinforced concrete T section slab with rectangular hollow clay block void formers; this was covered in an asphalt membrane with a heavily granulated surface. "This posed quite a few issues," added South Facing's Clive Collison. "Because of this, it was clear that the installation would require some special ballasting which would not compromise the integrity of the roof membrane and which would not deliver a point or cumulative load to detract from the structural integrity of any area of the building roof."

"Because of the roof design, we opted for concrete slabs mounted on expanded foam in order to satisfy all structural considerations and to meet BRE's requirements for frost resistance and a 30+ year lifecycle. Using 15° aluminium triangles and mounting rails manufactured by REDtip here in the UK, we designed the mounting frame to provide fifteen rows of eight modules, with a further two rows of just four modules to eliminate any risk of potential wind uplift (against maximum permissible ballast loading) at the exposed southern end of the building."

Following the successful completion of the roof-mounted PV system, South Facing is installing a ground-mounted installation near the entrance to the visitor reception area at BRE as part of BRE's development work on novel electrical networks.

Fresh thinking

Small wind is making a huge difference to individuals across the UK, explains **Dr Kevin Parslow** of Evance Wind Turbines

By installing a small wind turbine households and small businesses have found that they can achieve substantial energy savings. Small wind systems are also playing a part in assisting the fuel poor. As an example, Evance is working with some local government and community organisations that are helping to fund small wind turbines to harness wind power for communities and drive distributed energy production.

On the correct site, a small wind turbine can produce energy more efficiently and cost effectively than other renewable solutions, providing energy security and peace of mind for 20 years or more. Almost all of our installations are for rural homes, small businesses, farms and schools - often off the mains gas network – whose energy costs continue to rise. We have seen individuals move away from oil - costs of which have increased by 66 per cent over the last three years(i) – to electricity and heating generated by small wind turbines.

People are always pleasantly surprised by the compact scale of our small wind turbine systems – with a maximum tower height of just 18m, our R9000 installations are no bigger than a mature tree. You may or may not have spotted one, because the reality is that they are discrete and have minimal impact on the local surroundings. However, while they are unobtrusive, they do make a significant impact on energy savings and CO2 reduction.

It's these kind of individuals – not large commercial organisations – that are driving the UK small wind growth, and in doing so have contributed to the development of a new UK manufacturing sector that is seeing growth and employing more people despite current economic conditions.

At Evance we have seen a significant increase in the take up of small wind - our sales grew by over 200 per cent last year, including growth in our export business. To meet demand we doubled our UK manufacturing facility and increased our workforce by 25 per cent.

Our R9000 machine accounted for a third of all small wind turbines(v) sold in the UK last year – making it the UK's small wind turbine of

choice. Our growth continues and in the first five months of 2012, we have achieved 90 per cent of entire 2011 sales volume.

I believe small wind turbines have an important contribution to make to individuals and communities across the UK, as well as the UK renewable energy targets. The potential impact of small wind has yet to be realised.

Today Evance has over 1,100 turbines installed which are producing around 12,500MWh(ii) of energy per year – enough to power around 2,600 average homes(vi).These turbines can save over 5,350 tonnes of CO2 emmissions(iii), which equates to taking nearly 2,350 cars off the road(iv).

"With the rising price of energy we decided to invest in renewable energy so we were not reliant on oil. Our aim is for the Evance turbine to run anew electric central heating boiler and with the projected power generation we expect to reduce our energy bills by 50 per cent." Danny Shepherd of Aberdeenshire.

"We simply had to look at alternative power sources or face inevitable closure. Using the energy generated by Evance's turbines we are committed to cutting our diesel bills by at least 75 per cent. I've been pleasantly surprised that the majority of visitors haven't even noticed the turbines until they have been pointed out!" commented John Jennings, owner of the Kirkstone Pass Inn in the Lake District National Park. The turbines alone will reduce the Inn's CO2 emissions by over 22 tonnes per year – supporting a low-carbon Lake District.

(i) Quarterly Energy Prices, DECC – House of Commons Heating Oil standard note, 29 December 2011
(ii)Based on annual mean wind speed (AMWS) of 5.5m/s
(iii) Based on carbon savings of 0.43kg CO2 per kWh (DEFRA)
(iv) Based on an annual emission rate per car of 2.27 tonnes of CO2 (Society of Motor Manufacturers & Traders)
(v) 1.5kW-15kW
(vi) Based on average electricity consumption is 4,800kWh per household per year

WIND

What: Dairy farmer invests in sustainable energy solutions

How: Using a 10kW wind turbine

Result: 21,000 kWh per year of renewable energy generating half of the total energy used on the farm

It took just a few days for Ploughcroft to install a 15m tall 10kW wind turbine in a field owned by dairy farmer Mr Godsell who was looking for a source of sustainable energy to help him minimise the costs of running his operations.

After calculating the amount of electricity being used to operate milking equipment and milk cooling, Godsell investigated the prospect of using Evoco wind turbines. He was impressed with the appearance, efficiency and low noise levels of the turbines after visiting a number of installations and decided they were an attractive option for his farm.

Godsell needed to gain planning permission for the wind turbine, requiring that it was located at least 200m away from the nearest property. He also ensured that the average wind speeds in the area would yield a sufficient amount of energy to generate an attractive return on investment.

This particular wind turbine was Ploughcroft's first installation of an Evoco system. It is capable of producing an energy output of 21,100 kWh per annum which when used in conjunction with Godsell's additional renewable energy sources, can provide over two thirds of the energy needed on the farm.

"We expect that we will be able to generate half of our total energy usage from the turbine, which will create a modern farming unit with a much lower environmental footprint" he said.

"We are looking forward to being able to reap the benefits of this greener, cleaner source of energy," Godsell added.

Chris Hopkins, the managing director of Ploughcroft said: "Many farmers are recognising how wind turbines provide an attractive return on investment, particularly with a business like this that is a heavy user of electricity."

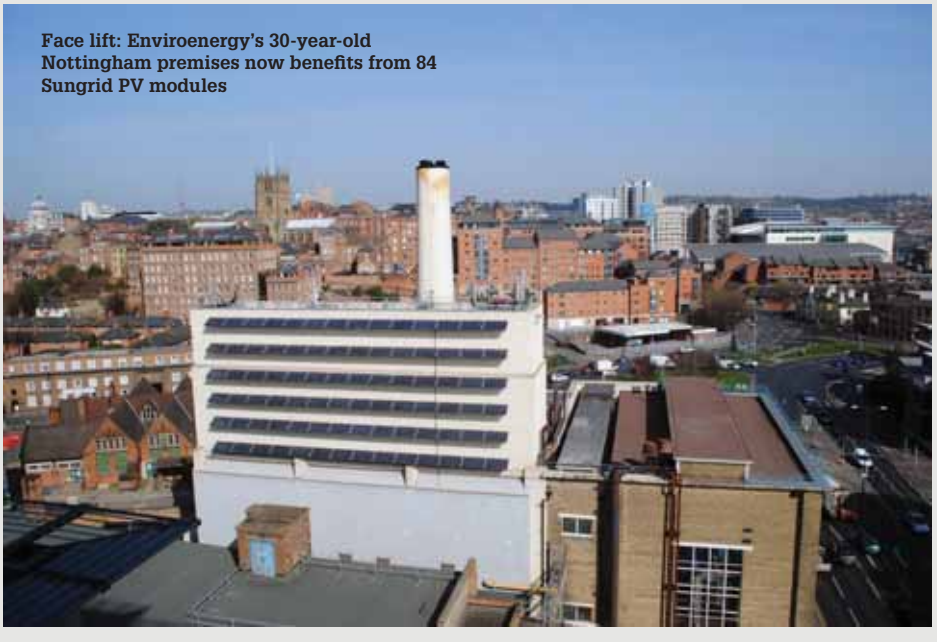
Full circle: The turbine on Godsell's farm is Ploughcroft's first installation of an Evoco system

SOLAR PV

What: Nottingham's Enviroenergy adds to its green credentials

How: Using 84 Sungrid 20.16kW modules

Result: Over £1,000 a year saved and 279kWp clean electricity produced annually



Face lift: Enviroenergy's 30-year-old Nottingham premises now benefits from 84 Sungrid PV modules

BIOMASS

What: Shropshire farm diversifies with biogas

How: The installation of an anaerobic digestion plant

Result: 1MW of sustainable energy with the potential to power 1,000 homes

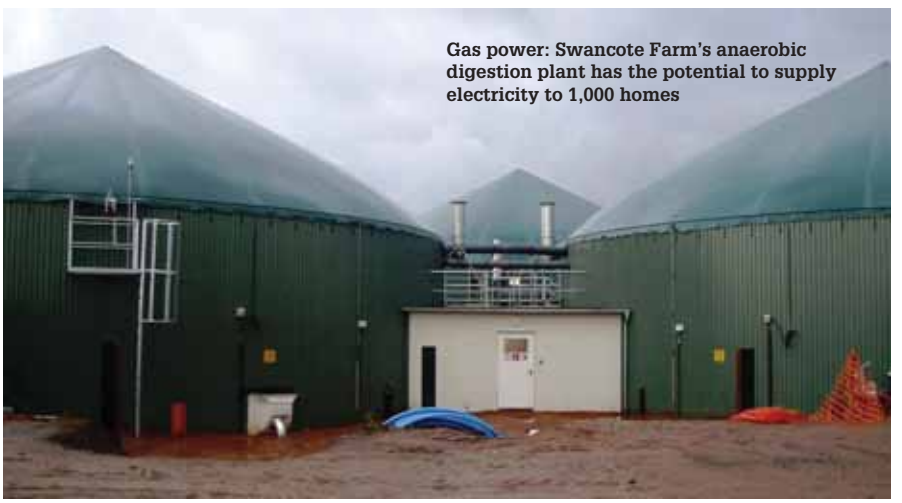
Wolverhampton-based electrical contractor Cosgriff Whitehouse (CWE) has been called upon to install the entire electrical cable work required for an anaerobic digestion plant on Shropshire's 700 acre Swancote farm. The plant itself was developed by German biogas firm MT Energie and has the capacity to produce 1MW of green electricity.

Food waste, animal slurry and crop residues are stored in sealed tanks without oxygen which can then be digested by naturally occurring organisms to release methane-rich biogas. The resulting gas can then be used to generate energy in the form of electricity, gas and heat. Any waste from the process will be recycled as a nitrate and phosphate-rich fertiliser.

The collaboration of MT Energie and CWE has produced an anaerobic digestion plant which they say produces 20 per cent more biogas than other systems due to a secondary digester tank.

Andrew Black of MT Energie said: "We couldn't have been more highly impressed by the service we received from CWE on the electrical cabling work for the Swancote energy project."

Peter Whitehouse, managing director of CWE, added: "Government schemes such as the Feed-In Tariff and the Renewable Heat Incentive are making anaerobic digestion plants such as Swancote a viable opportunity for farmers to diversify their operations and gain additional income. They're major environmental advantages too, as it helps cut waste and provide a greener source of energy."



Gas power: Swancote Farm's anaerobic digestion plant has the potential to supply electricity to 1,000 homes

Leicester-based renewable specialist Intelligent Energy Solutions (IES) has improved the energy efficiency of Nottingham's Enviroenergy plant with the installation of 84 20.16 kW solar panels on the company's London Road premises. Enviroenergy's site uses steam produced from the incineration of waste from 250,000 properties in order to generate electricity and hot water for households and businesses in Nottingham.

Peter Searancke, managing director of IES, which won a Renewable Award in 2011 for other PV projects in Nottingham, said: "The installation was completed on time and to budget.

"Sungrid was chosen because they produce high quality, high efficiency solar panels that deliver a great value proposition. The design of these panels enables the manufacturer to offer leading material and performance warranties, which is critical for an installation like this."

Enviroenergy says the system saves it in excess of £1,000 per year through lower energy bills whilst also increasing the productivity of the factory and providing more electricity and hot water for a growing number of properties.

The initiative was enacted as part of Nottingham city council's commercial PV framework.

The council's portfolio holder for energy, Alan Clarke, described the installation as: "Yet another example of how the city council and its partners are delivering against its manifesto pledges and energy strategy."

Combined with Nottingham City Council's other PV projects, Clarke added: "These systems will generate 279kWp of electricity which is enough to meet the demands of 65 homes per year or illuminate 8000 35W light bulbs."

Andrew Estrop, manager of Enviroenergy, said: "We worked closely with IES to develop and design a system which will benefit the city of Nottingham for many years to come"

Turbines, travelling and test cases

Who: John Gumbley, Eagle Power Energy

What: Eagle Power Energy is a Yorkshire-based wind turbine installation and engineering company. Owner John Gumbley has been a pioneer in the wind industry for twenty years – fitting his first turbine at his own home in 1992. Gumbley and his team now work exclusively with Kingspan Wind for customers across the north of the UK.

Northern star: John Gumbley, Eagle Power Energy. The company works exclusively with Kingspan Wind for customers across the north of the UK

Monday

My week starts with a team meeting to discuss five upcoming installations. Working exclusively with Kingspan Wind turbines means that the majority of our customers are rural domestic applications, so planning the week and travel requirements with the installers, electricians and excavators is essential. We have checked that planning permission has been granted, Feed-In Tariff applications are in place and that we have Distribution Network Operator approval for any grid connections.

As the concrete needs three weeks to set before we can install the turbine, today we're booking a second-stage installation for a customer who has already had a base fitted. This particular install will be a test case for our MCS assessment on Wednesday.

Later in the afternoon, we have a visit from Kingspan Wind to chat through our sales forecast and marketing requirements.

Tuesday

I set off early with our project manager and contractor to visit two sites so we can give a full quote on excavation work prior to base fittings. Once we know the customer is happy with the quote, our office manager raises the deposit invoice, ensuring all received deposits are registered with the REAL (Renewable Energy Assurance Limited) Assurance Scheme so that the customer and install are covered.

In the afternoon we confirm the dates for our other upcoming installations, sending out confirmation instructions to the all the teams involved, as well as making final preparations for our MCS assessment tomorrow.

Before leaving the office I remember to re-programme the inverters on our two 6kW Kingspan wind turbines, which we rely on for 90 per cent of our own electricity requirements. These also feed into a divert system to contribute towards hot water and central heating – so wind power really is at the heart of everything we do at Eagle Power!

Wednesday

Most of today is taken up with the MCS assessment. The assessor spends the day on site running through our processes, documentation and inspecting our test case to ensure we carry out our installs to the highest standard. Later in the afternoon we're delighted to hear that we have passed with flying colours! Towards the end of the day we also liaise with a customer who is organising his own excavation before we install the base and turbine. His property is in a rural location (all communication is done over email as he has no phone connection), so this is an off-grid application, much like ours at Eagle Power.

Thursday

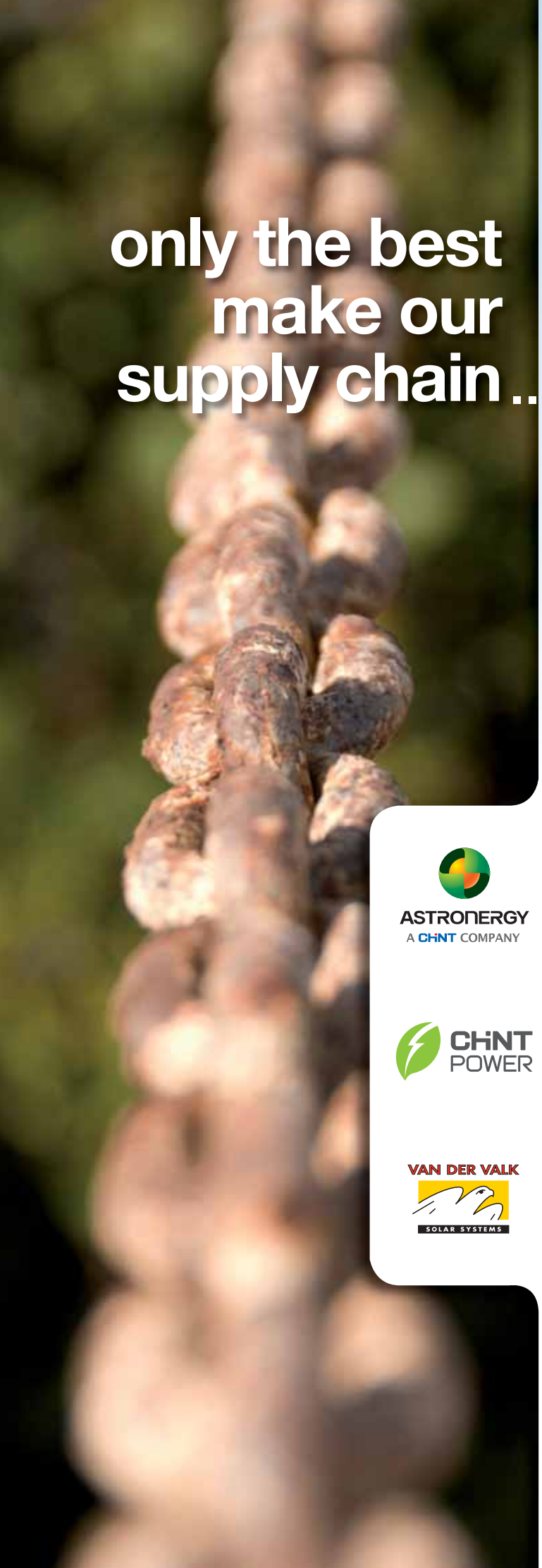
An IT specialist comes in to work on our customer management database, so we can create a bespoke system. Working in an industry where there are constant developments in both technology and policies, it's really important that we keep our customers in the loop about issues that might affect them. As Kingspan Wind Accredited Installers, we pride ourselves on providing the highest level of customer service, so staying in regular contact with everyone we've worked with helps us gather valuable feedback and deliver ongoing support. Today our servicing team is out at another rural grid connection, one of more than 200 installations we service.

Friday

This job involves a lot of travelling, usually up to ten site visits per week. I enjoy the chance to visit countryside locations and today's site survey is in South Yorkshire. We've already taken wind speed readings and now need to agree the best site for the turbine with the customer for maximum results. There are lots of factors to take into account, including the distance from trees and neighbouring properties, any noise issues that could arise, the landscape and other aesthetics. We have to consider planning regulations and consult regularly with local planners and specialist planning advisers to ensure the best possible service to our customers.

Once the site is decided, it's back to the office where we write up the report in line with MIS3003 MCS guidelines. This allows us to estimate the output that we can expect from the system and helps calculate the Feed-in Tariff income. It's a key stage in our order process, giving our customers an educated assessment of the performance levels they can expect. The last job of the day is to finalise requirements for our busy upcoming schedule of agricultural shows and exhibitions.

No rest for the wicked! It's off to a customer open day at one of our installation sites tomorrow, before packing for a much-needed holiday. Phew!



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