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IT APPEARS the success of the solar and PV industry has captured the attention of politicians as planned by the industry. Except the industry expectation of making solar a hot topic for the next election has seen a response that has surprised many.

The environment secretary, Liz Truss issued a press release through the Department for Environment, Food and Rural Affairs (DEFRA) stating that solar farms were a blight on the countryside and were preventing farmers from growing food as farmers should. She has decreed that farmers using their land to host solar arrays will lose agricultural subsidies for the land. The grants are currently paid through the DEFRA on behalf of the European Union’s Common Agriculture Policy.

The argument presented to allow such a cost cutting method did not seem to win Truss any friends or supporters. Former energy secretary, Chris Huhne made comments expressing his surprise at the move and felt that the rationalisation of food production made no sense. Even worse is the realisation of how little government departments actually communicate. If Truss had bothered to stay informed with DECC and their pronouncements on encouraging agricultural based solar, she may have not been so quick to respond to the chorus of voices that mislead her on the facts.

This all comes at a time when ground mounted PV cumulatively catches up with roof based arrays. The ground mounted PV has been the main driver over the last couple of years. It seems implausible that a government minister can be so ill informed and persuaded by a vocal minority and then bring that emotional response to a political decision.

A quick read of the press release shows that is exactly what happened.

To add further discredit to Truss’ decision, DECC has since released a voluntary agreement for the industry that pledges greater support for local ownership of solar farms. It will be interesting how these two opposed views from the one government will be resolved.

The missteps and misinformation could be in the industry’s favour in the long run as it is an opportunity to put solar in the political agenda for the voting public. In many ways Truss has handed the industry an own goal as industry and agriculture will combine for this issue.

Perhaps Liz Truss should also have had a chat to DECC about the consequences of unilaterally changing policies that directly effect the industry.
State of UK solar
The UK PV and solar industry is world leading and is driven by the government’s need to achieve its ambitious carbon emissions target.

Stability needs to be preserved
With an election looming both major parties will need to address energy issues with some interested players saying more of the same.

Solar market eyes Scottish growth
The early UK growth was focused on the South East but has steadily moved Northwards. Scotland seems ready for a solar boom.

Towards self sufficiency
One young company is making a name for its self by focusing on enabling customers to achieve self sufficiency in their energy production.

Urban community
The government has announced a new fund that will encourage community ownership of renewable energy programmes in an urban environment.

Solar UK Awards
The annual awards for the UK solar and PV industries have been announced and received, showing a strong and vital community.

Sustainable cities
Ecobuild returns to London and showcases solar and PV technologies in the midst of one of the world’s largest gatherings of sustainable ideas.

Inverter failure check list
What are the five most common problems that can occur with the engine room of any solar installation: the inverter.

Testing installations for future benefit
Routine maintenance of any solar array must include a comprehensive testing programme to ensure the best returns from your renewable investment.

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By using the experience in semiconductor manufacturing the team at Seraphim have created one of the highest functioning manufacturing facilities in the solar industry. By applying the same high standard of manufacturing as can be found in the semiconductor world, Seraphim has achieved a standard of PV manufacturing that is fast becoming the industry benchmark. As they move into each new area they develop local infrastructure such as the Rotterdam site they have set up to feed European demand. The company is fastidious in achieving the highest quality product and have passed every test available. Including fire tests, ammonia certificate, salt mist compliance and on-site power measurement validation.

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AFTER DECC announced that it was ending the Renewable Obligation (RO) scheme two years earlier than anticipated, four major UK solar companies decided to pursue the decision in the courts. Unlike the last challenge to the government’s subsidy tinkering, the High Court has dismissed the complaint and ended the case.

TGC Renewables, Solarcentury, Orta Solar Farms and Lark Energy has stated they had the rug pulled from under them at the time of the announcement. Despite the judge agreeing with their argument that the move would have a retrospective impact on solar projects under development or in planning stages, the judge also felt that it was reasonable for DECC to set a qualification deadline.

Despite the loss the claimants are not completely dissatisfied as there was a sense that the legal process had raised issues that DECC had subsequently responded to. Commenting on the High Court judgement, a spokesman for Lark Energy, Solarcentury, TGC, and Orta said, “The decision to launch the JR was taken immediately following the 13 May announcement, which as it originally stood closed ROCs for solar in an unlawful way.

We are pleased that as a result of our court action, DECC moved significantly during the consultation period and the proposed grace period criteria set out in the May consultation were relaxed in the consultation response on the 2nd October. This ruling may have serious implications for the wider energy industry. We are considering whether to seek leave to appeal and will make a further statement in due course.”

The subsidy cut applies to all solar wind farms of more than 5MW capacity and comes into force on April 1 next year.

Global installed PV to treble by 2020 to 414GW

THE GLOBAL CUMULATIVE installed capacity of solar PV modules will more than treble from 135.66GW in 2013 to 413.98GW by 2020, according to GlobalData. The company’s latest report states that emerging economies in Asia-Pacific, South and Central America and the Middle East and Africa are expected to be the major markets in the future.

Swati Singh, GlobalData’s Analyst covering Power, explains, “Asia-Pacific is home to many developing countries, including India and China, where substantial installations are being made. The region is also a leading area for solar energy systems production, with Japan, China and Taiwan being three of the largest solar PV cell manufacturers in the world.

“Governments in the region are promoting solar module manufacturing through various long-term policies, financial incentives, subsidies and tax benefits. This strong commitment to solar energy development has led to numerous research and development initiatives and increased solar module production and installations, which will drive future market growth.”

The analyst adds that Asian companies dominate the global PV device supplies market, with seven Chinese companies currently among the top module manufacturers worldwide. Last year marked a turning point in the solar PV space, as China, India and Japan accounted for the majority of global annual installations. China’s growth was especially remarkable, contributing around 12 GW of the world’s 37-GW additions in 2013.

Singh explains, “Prior to 2013, most solar PV installations were in Europe, with Italy, Germany, Spain and France accounting for the majority of global annual installations in 2012.

“Reduced solar PV module prices, combined with European countries’ Feed-in Tariff (FiT) subsidies, have supported the widespread growth of small-scale distributed capacity there. However, GlobalData believes that these tariffs are likely to become less generous in subsequent years, with the reduction or removal of incentives having already been proposed and implemented in some of the region’s countries.”
Commercial solar FiT to be transferable

BUSINESSES will be able to take their solar panels with them when they relocate under proposed changes planned by the UK government to current laws.

Businesses and factories will be able to take their solar panels with them when they relocate, allowing them to continue to reap the benefits of lower bills under proposed changes planned by government.

In a consultation recently launched, the government is seeking views on removing a barrier for building-mounted solar PV by allowing medium and large installations to be moved between buildings without loss of Feed in Tariff payments.

With an estimated 250,000 hectares of south facing commercial rooftops – the equivalent of 350,000 football pitches - there is massive potential in the UK to turn our buildings into power stations, helping to cut energy bills, reduce pressure on the grid and create jobs.

Launching the consultation, Parliamentary Under Secretary of State for Energy, Amber Rudd said, “Around 900 businesses already use solar PV - but I want to see more generating their own electricity. There’s potential for significant growth in this area so it’s vital that we remove the barriers which prevent businesses from benefiting. If there’s more rooftop solar we’ll see job creation as well as helping us deliver the clean, reliable energy supplies that the country needs at the lowest possible cost to consumers.”

“Solar increasingly offers efficient and cost effective onsite generation opportunities to both businesses and domestic consumers.”

At the moment if a FIT accredited installation is moved it becomes ineligible for further support. This can act as a significant deterrent to landlords and tenants who cannot guarantee to have the long-term ownership or lease of a building. Allowing the panels and the tariff to move with their owner will increase flexibility and make solar PV a much more attractive investment.

The definition of building-mounted solar under the Feed-in Tariff will be amended to require the building to use at least 10 per cent of the electricity generated. In addition, DECC is introducing a 12 month grid delay grace period for solar PV projects when the Renewable Obligation closes to 5MW plus schemes. This will provide extra time for accreditation in cases where grid delays cause the project to miss the 31 March 2015 closure date.

New JV aims to develop 300MW of PV installations

A NEW joint venture company, AMP Solar UK has been launched, combining the experience of three solar energy firms and the financing support of Apollo Investment Corporation. AMP Solar UK will offer free and paid-for solar energy programmes, allowing customers to benefit from cheaper energy, and potential new sources of income.

Among the parties to the joint venture, MAP Environmental is responsible for origination, lead-generation and marketing, AMP Solar Group contributes experience in solar asset development, finance and asset management globally, while Sustain Energy Solutions Ltd brings extensive knowledge and skill in undertaking EPC and O&M contracts for both ground-mount and rooftop solar projects, including for housing associations. Collectively, the parties have successfully developed and constructed over 400MW of solar.

AMP Solar UK was established to acquire, build and manage a portfolio of over 300MW of ground-mount, commercial and residential solar energy installations. The Company’s special focus will be on social housing rooftop developments, with the goal of bringing at least 75,000 tenants out of fuel poverty. In addition, AMP Solar UK has a significant portfolio of planned ground-mount projects.

Developers, commercial landlords, housing associations and other potential end-users can purchase solar systems outright from AMP Solar UK, thereby producing an income from generated power. Alternatively, end-users can opt for a no-cost managed installation and benefit from a PPA, through which they will receive discounted energy, with costs fixed over a 20-year term.
Savills Energy calls for greater investment in commercial rooftop solar

WITH NEWS THAT the International Energy Agency (IEA) expects solar to become the biggest single source of energy by 2050, the expectation is that rooftop solar will account for around half of the world’s total solar PV installations.

However, Savills Energy’s Giles Hanglin is warning that work still needs to be done if the UK is to benefit from this trend and is calling on the Department for Energy and Climate Change (DECC) to outline the next steps in its solar strategy. Hanglin, who looks after the national coordination of solar rooftop delivery for leading property and energy consultancy Savills Energy, has suggested that three areas need to be progressed if solar PV is to reach its full potential in the UK: grid capacity, property valuations and the impact on leasehold and tenancy agreements.

At a recent briefing with DECC, Hanglin said, “With around 70% of the UK’s commercial property being leasehold, this is an area that certainly has to be broached to allow substantial growth in capacity of solar PV on rooftops. Indeed, all of the evidence from our valuers and third parties shows that solar can add significant value to a commercial property.

“One of the challenges this raises is that average commercial lease lengths are under 10 years, while landlords need to be persuaded to make what is typically a 25-year investment in solar. The legal suite of documents for the roof sublease, power purchase agreement (PPA), installation procurement and operation and maintenance (O&M) contract must be right in order to ensure that a property and the agreement around it can be valued with accuracy.”

Hanglin went on to outline the benefits to both landlords and tenants looking to invest in rooftop solar saying, “When you consider the returns on investment, capital appreciation, improvement in EPC ratings of buildings, as well as improvement in their CSR and green credentials, the opportunities for landlords looking to take on solar PV installations are considerable. There have also been a number of studies showing how solar can add value to a commercial property. Alongside the potential electricity cost savings from the discounted solar PV electricity, business tenants will also be able to take advantage of improving their green credentials and CSR. There have been some really positive announcements from top tier retail names of late, in terms of investing in large scale rooftop solar, but there is still plenty to be done.”

Calling on DECC to outline the next steps in its solar strategy, Hanglin said, “We believe commercial rooftop solar will prove to be vital in helping to meet future energy requirements. As such, we welcome the DECC consultation into increasing permitted development under planning up to 1MW in size and also the discussion around plans to allow rooftop solar installations to be transferred between buildings without losing FiT accreditation.
New network to shake up male-dominated renewable energy industry

A NEW NETWORK, which will challenge the assumption that renewable energy is a male-dominated industry, was kickstarted at the south west’s low-carbon event. Entrepreneurial Women in Renewable Energy (EWiRE), an initiative that has been driven by Regen SW events manager Rachel Hayes, was launched at the Annual Renewable Futures conference in Bath in front of some of the industry’s most successful businesses. It was a significant day for EWiRE as the enterprise received notification that it has gained funding from the Joseph Rowntree Foundation. Rachel is now urging all ambitious women in the UK renewable energy industry to connect with the network and raise the profile of women in what is often perceived as a male dominated area of business.

“Despite having some exceptional high-profile women working in the energy industry, there is still a huge imbalance, with men filling the majority of the highest positions in successful companies,” she said. “As a modern, growing industry it’s imperative that we address this and encourage women to rise to the top.”

Rachel was inspired to start the initiative after reading Sheryl Sandberg’s book Lean In in 2013. She discussed her idea with Regen SW director Cheryl Hiles, who has played a key role in the growth of the non-for-profit organisation, rising through the ranks at Regen to her senior position.

“Our key objectives are simple but ambitious,” added Rachel. “We aim to greatly increase the visibility and profile of women working in sustainable energy businesses and promote the attractiveness of working in the sector to encourage wider female participation.

“Improving this gender balance is crucial if we’re to develop an industry that can forge its way forwards through the 21st century.”

Entrepreneurial Women in Renewables will consist of a number of initiatives, including networking events, promoting board positions to the network on the Regen SW site, promoting case studies of successful women in renewables, and a training and mentoring programme for those women who are entering the industry and have ambitions to rise through the ranks.

The launch was welcomed by successful women in the industry, including Sonia Bedford, head of renewable energy at Stephens Scown Solicitors.

She said, “Entrepreneurial Women in Renewables is a welcome initiative that should go a long way towards removing many of the perceived barriers that women in our industry face. I look forward to seeing increased visibility for prominent women within the renewable and a focus on role-models that others can aspire to.”

Gareth Redmond from the Department for Energy and Climate Change (DECC) said: “Can I congratulate the Entrepreneurial Women in Renewables Initiative. If DECC can help lend its support we would love to.”

The group’s first meeting as a formal network – an event with the opportunity to meet up with other like-minded women – will take place at the end of January 2015.

Any women that are already in or would like to become involved in the renewable energy industry should contact Rachel Hayes at rhayes@regensw.co.uk, 01392 494399.

Bluefield announces additional 5.2MWp to Hardingham

BLUEFIELD SOLAR INCOME FUND has announced that it has entered into a contract for the construction of a UK based solar energy plant.

The 5.2 MWp ground based solar PV array is an extension to the Hardingham Project, an operational solar PV asset based in Norfolk with a 14.8 MWp capacity, which already forms part of the Company’s portfolio of operating assets.

It is expected to qualify under the 1.4 Renewable Obligation Certificate regime. The extension is being funded for a consideration of £5.75m, including working capital and expenses.

The acquisition is the twenty fifth made by the Company and will be funded by part of the £123 million raised pursuant to the placing programme that closed on 13 November 2014.

Solarcentury will build the extension and will then warrant its performance for an initial period. It will undertake the ongoing operation and maintenance of the plant under a separate agreement.

The Company can confirm that it continues to target a dividend of 7 pence per ordinary share in respect of the Company’s current financial year, which ends on 30 June 2015, with the intention of this rising annually with RPI thereafter.

On 3 November 2014 the Company declared an interim dividend for the current financial period of 3.25 pence per ordinary share.
Yingli Solar to supply Solar Century

YINGLI SOLAR has announced that the company will supply 72 megawatts of multi- and monocrystalline solar panels to Solarcentury, a solar company in the United Kingdom. In terms of the agreement between Yingli and Solarcentury, the company will complete the delivery of approximately 168,000 solar panels by the end of this year. The panels will be installed in projects across the UK. These projects will produce approximately 65,000 MWh of clean solar electricity per year, enough to supply around 21,800 typical UK homes.

“We are pleased to join forces with our partner, Yingli Green Energy, for these projects. We have worked together for a number of years, and the trust built up over that time makes it easier to execute on projects at this scale. Solar is still the most popular form of renewable energy among the UK public, unsurprising since developing our solar capacity stands to benefit many people and businesses,” said Mr. Matthew Boulton, Chief Operating Officer, Solarcentury.

“It is our pleasure to partner with Solarcentury, one of the most innovative companies in the UK. As we continue to see a strong market in the UK with a steady growth potential, we look forward to cooperate with this long-standing solar company on more exciting projects in the future,” said Mr. Liansheng Miao, Chairman and Chief Executive Officer, Yingli Green Energy.

Ingenious Clean Energy announce sale of PV parks

THE OPERATING PORTFOLIO is composed of five projects ranging in size from 7MW to 24MW, with a total peak power capacity of 64MW. Four of the five assets were developed and constructed by Anesco Limited, and the largest of the solar farms (the 24MW project known as Stowbridge) was developed by AGR Renewables Limited and constructed by Hanwha QCells. Baiju Devani and James Durnall led on the transaction for Ingenious.

“We are very pleased to complete the successful sale of our operating solar portfolio to Magnetar Solar,” said Sebastian Speight, Managing Director of Ingenious Clean Energy. “With this transaction now complete, we can now focus on our expanding activities in developing, constructing and acquiring further renewable generation assets.”

“The government determined that solar energy needs to be a significant component of the UK’s mix of energy sources, and it has developed a strong market to support that goal,” said Alan Shaffran, head of Magnetar’s fixed income business in Europe. “We’re excited about the opportunity to invest in the UK market, adding to our solar portfolio. We view this business as an attractive source of stable returns.”

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State of solar in the UK

As the Government has confirmed a target of an 80 per cent reduction in carbon emissions by 2050 (from 1990 levels), it is an important time to consider equipping and refurbishing buildings with energy efficient and renewable technologies. Chris Bratherton, Group Sales Manager at Ecolution, looks at the current state of the solar PV industry in the UK and how it can continue its growth going forward, highlighting the need for credible and consistent signals from policy makers.

THE UK SOLAR PV MARKET has seen an unprecedented period of growth in comparison to the rest of Europe. In the last year alone, we have seen over 2 gigawatts added to the market, bringing the UK’s total solar PV capacity to 5 gigawatts. To give you an idea of how the market is performing, at the end of 2014 Q2 there were a total of 571,960 installations, an increase of 5.3 per cent on 2014 Q1. Most of this capacity was from domestic installations (one-third of total capacity) and large scale ground-mounted arrays (20 per cent).

A growing number of organisations are now aware of the many benefits of turning to solar PV for their electricity. From lowering carbon dioxide emissions to lower bills, organisations can also generate an income from their solar PV installation from Feed-in-Tariffs (FiTs) over a period of 20 years. Investing in commercial rooftop solar PV is on the up; many companies such as Sainsbury’s, IKEA and Kingfisher have all invested heavily and installed solar PV systems on the roofs of their buildings, and many others are now recognising solar PV as an additional asset when valuing properties. Organisations with solar PV installations have also reported an increase in awareness from employees in energy usage, its costs and they are far more likely to switch lights off and conserve power.
Furthermore, the UK Green Building Council (UK-GBC) reports that from 2018 it will be illegal to rent out commercial property that performs below an E Energy Performance Certificate (EPC) rating.

With all large organisations now required to undertake energy audits to cover both their buildings and wider energy use under the Energy Savings Opportunity Scheme (ESOS), one way organisations can drastically improve their energy performance is by deploying rooftop solar PV systems. According to the UK-GBC, there are 1.8 million non-domestic properties in the UK, with the UK Solar PV Strategy Part 2 reporting that a quarter of a million hectares of unused commercial roof space is south facing, making it prime for solar arrays.

So what is currently stopping us?
The decline in the cost of solar energy, combined with a greater understanding of its financial benefits have made rooftop solar more appealing. However, the Government has not grasped that the UK could become a very strong competitor or even a world leader in manufacturing, creating and distribution of energy. There is a great potential to nurture renewable energy and create many jobs in manufacturing as at the moment most products are manufactured in Germany and China.

Unfortunately, the Government creates too much legislation and needs to streamline its initiatives. Recently the Department of Energy and Climate Change (DECC) announced a change in the Renewables Obligation (RO) that will take away support for solar farms with a capacity greater than 5 megawatts. The news is a big blow to mid to large-scale solar PV, considering two-thirds of this year’s 2 gigawatt capacity was from farms exceeding 5 megawatts in size and capacity accredited under the RO, representing 34 per cent of total solar deployment.

Another stumbling block in the UK solar industry are legal complications with regards to ownership of solar PV arrays. At present, a business cannot dismantle and take its solar PV array if it moves to new premises. The main reason for this is that FiTs do not allow installations to be transferred between buildings at this moment in time, however consultation on this subject is underway. As many of the UK’s commercial properties are leased rather than owner-occupied, a change in FiTs to accommodate commercial tenants is needed to allow them to benefit fully from investing in solar PV to lower their electricity bills, earn money and reduce
their carbon emissions. Many business owners have shorter leases on their properties than the 20 years typically needed to make investment in solar worthwhile. If they decide to move, they need a guarantee that they would not lose the original FiT rate.

With unstable energy security it is vital to stress the importance and ease of renewable energy to the public more, and it has to be done with more urgency. End users need to understand and accept solar PVs as a power source. Perhaps if the Government focused on one simple reward scheme for renewable energy, we would see it becoming the default energy much sooner. However...

Given that 18 per cent of the UK’s carbon emissions are from non-domestic buildings, the public sector, developers, commercial property owners as well as planning authorities should be encouraged to invest in zero carbon alternatives; coupled with high energy prices, renewable energy technology such as solar PV with its low electricity costs and zero carbon emissions could transform the electricity market in the UK. As reported by the International Energy Agency (IEA), solar could be the world’s largest source of electricity by 2050, ahead of fossil fuels, wind, hydro and nuclear.

With the cost decrease of PV modules and systems, they could generate up to 16% of the world’s electricity by 2050 while solar thermal electricity (STE) from concentrating solar power (CSP) plants could provide an additional 11%. Combined, these solar technologies could prevent the emission of more than
2050, providing that a key set of policy actions and milestones highlighted in the reports are achieved by the same date.

DECC is to consult on plans to allow rooftop solar installations to be transferred between buildings without losing Feed-in Tariff (FIT) accreditation. Other plans by the DECC to boost community ownership of solar projects are also a positive step for the industry, provided they are flexible and voluntary as they would require commercial developers to open up schemes to local ownership.

Organisations could invest in solar PV as part of their Corporate Social Responsibility (CSR) activities in the localities in which they are based. Community ownership has long been an important segment to the solar industry as it not only empowers local communities, it also educates and informs users on the viability of solar PV as an electricity source which overall, is the main barrier to take-up.

DECC is also looking to relax planning permissions for commercial and industrial rooftop solar systems over 50kWp, in favour of tapping into the large buildings’ potential. This may see government offices, factories, supermarkets and car parks evolve into ‘solar hubs’, generating a large proportion of their own power.

A case in point
Although a grid connection is always required for solar PV system, organisations save money when the peak power output of the PV system meets the business’ maximum power demand as there is no requirement to buy power in from the grid, representing significant energy savings and a reduction in carbon dioxide emissions.

In order to boost the uptake of solar PV from the public sector, housing associations and property developers, the rooftop market needs changes to its funding levels to support the move to increase the capacity threshold that triggers a full planning application.

Rooftop solar PV capacity from systems above 250 kilowatts (kW) represents only 3 per cent of the market today. Organisations with a large energy expenditure and roof space can benefit significantly by investing in rooftop arrays. An example of this is an installation Ecolution carried out for the Heart of England NHS Foundation Trust (HEFT) on Solihull Hospital and Heartlands Hospital, Birmingham. Here, the Trust will benefit from over £2 million in energy savings and Feed-in Tariff payments within the next 20 years. Before the installation, HEFT spent over £1 million a year on energy and after installing a 250KWp solar PV system at each hospital, they now save 10 per cent on their expenditure. If you take into account rising electricity prices in the future, HEFT is set to benefit further than what was initially estimated.

Organisations such as HEFT also benefit from Ecolution’s remote monitoring portal that allows both parties to see the generation data. Overall, Ecolution installations have over performed by 7 per cent from pre-installed estimates.
A year of stability, education and investment

After a turbulent few years, 2014 has been the year where Solar PV in the UK has really taken off. Policy stability, combined with continued widespread public support, has led to industry confidence and seen year-on-year growth of a staggering 25%. Simon Baggaley, UK Sales Director of Enphase Energy discusses how with his conversations with installers that there is a great deal of welcome optimism in the UK PV industry.
OVERSHADOWED by ground mounted, large scale solar, the residential market is the real backbone of the industry. Thanks to the stability brought about by the Feed-in Tariff (FiT) the UK’s residential sector has quietly and confidentially gotten on with the job of making solar mainstream.

Better access to finance has meant that installers are able to offer genuine choice to those considering installing solar panels on their roofs. Home owners now often have the option to defer payments, meaning the obstacle of the upfront capital is overcome. Installers are therefore selling systems based on the lifetime cost – which for Enphase Energy provides a real competitive advantage as we offer a 20 year warranty on our microinverters as standard. It’s actually a real injustice in the system that too often PV systems are being sold with short life spans, which end up costing the consumer more in the long-run. If there’s a 20 year FiT it makes little sense to buy a system with a lifetime of anything less.

For Enphase 2014 has been a year of education, education, education. We want to ensure that installers understand the lifetime benefits of our system, and are offering consumers a real choice. We expect 2015 to be another good year for UK solar. In a General Election year of course there is an element of uncertainty, but I am confident the FiT won’t significantly change – we have a healthy and growing market; it wouldn’t make sense for any political parties to change it significantly.

CfD anxiety
Uncertainty around Contract for Differences may be a force for change in focus in UK solar. A number of the utility scale solar developers and funders have announced moves into roof mounted solar as a result of policy changes to the ROCs mechanism. The residential market could see a lot of change next year, and much of that will be down to finance, and we could see a shift from self-invested to financed systems under new financing mechanisms.

I don’t see new finance entering the market as a replacement for the small scale installer industry though. The UK now has a strong base of quality professionals able to offer home and business owners’ loaned finance and a peace of mind guarantee. New investment entering the market will only grow the market, and in particular the large scale roof and multiple roof industry.

Continued growth and success in part depends on the Government providing a stable policy framework. But the industry must do its part too – we need to focus on selling quality products that deliver a good return on investment, and operating in an ethical way. There’s a danger as the industry grows that some fall into the trap of ‘cowboy’ selling tactics, and this is a path we mustn’t tread. Strengthening regulations can only be a good thing to ensure UK solar continues to be a well-regarded popular source of energy.

Residential success
In summary, residential 2014 has been a stand-out year for UK solar, driven by a stable investment environment, access to finance, and proactive installation companies in sales and marketing approach, driving the market themselves. I see no reason for that not to continue into next year as long as the FiT doesn’t change; my message to Government would be make sure isn’t changed or affected by the General Election.
Finding a single solution for social housing needs

Weaver Vale Housing Trust needed to install solar on hundreds of small roofs and decided on Enphase microinverters for every installation. This led to a learning curve in moving from pilot project to complete roll out for developer Rothwell Plumbing.

**Partner selection**
Wigan-based Rothwell Plumbing was selected to install the first 500 systems. The remaining systems will be built over the next three to four years.

Matthew Woolley, an energy efficiency officer at Weaver Vale Housing Trust, says the first several projects were a learning experience.

The earliest ones used string inverters. As the trust learned more about solar technology, they asked contractors to supply microinverters instead.

Microinverters are “not as prone to failure,” Woolley says. “If there’s any shading, you haven’t got an issue with taking out the whole array. And if there’s a problem with one panel, other panels continue working independently.”

**Simple to Scale**
Each system at Weaver Vale Housing Trust is designed for six to 14 solar panels. Across hundreds of rooftops, Rothwell Plumbing’s team have to contend with a variety of tilt angles and orientation to the sun. This would have complicated the system design process if they had specified string inverters. DC optimisers didn’t provide a simple answer either, as it is impossible to use DC optimisers on an array with fewer than eight panels. With microinverters, the scale of the project adds no complexity.
to the design. Every panel gets a microinverter. It’s that simple. “The Enphase Microinverter is a pretty fit-and-forget piece of equipment,” says Joe Cooney, Rothwell Plumbing’s estimator. “You couldn’t make a mess of it, to be honest with you. It’s not that complicated.”

Ample Experience
The ability to ramp up from dozens to hundreds of installations at a time is nothing new for the installer: That was how it made a name for itself three years ago, before teaming up with Enphase. Rothwell Plumbing had just started work on a contract to install five systems a week when the UK government announced that, in short order, the price for solar electricity supplied to the grid would be cut in half. The client wanted to know how many systems could be installed in three weeks. Graham Rothwell, the managing director, said his company could do 300. “We ended up installing 400,” he says. Next on the list: hundreds of Enphase Systems at Weaver Vale.

Installation summary
Client: Weaver Vale Housing Trust
Location: Cheshire, England
Installer: Rothwell Plumbing
System Size: 1,017 kW
Microinverters: Enphase M215
Modules: Risen Solar
Solar boom dawns for Scotland

Scotland has been an early enabler of renewable energy with a strong wind and hydro portfolio. Lightsource Renewable Energy is tipping the region to add a new feather to its renewable cap suggesting solar is set to boom.
Scotland is leading the way in the UK for renewable energy generation with nearly 50 per cent of its electricity needs being provided through renewable sources, mainly via wind and hydro energy technologies. Recent developments in solar photovoltaics (PV) have revolutionised our ability to harness the power of the sun making solar PV technology a realistic, cost-effective, and sustainable energy source worldwide.

For Scotland, solar PV energy generation is quickly emerging as a complimentary local energy source which will help meet the nation’s 2020 targets of the equivalent of 100 per cent of gross annual electricity demand from renewable energy generation.

Scotland’s vision for a renewable energy future, as the 2020 target for the renewable share of total electricity generation has now been raised from 50% to 100%. To date, the Scottish renewable energy sector has had its focus set predominantly on wind and hydro energy generation – with around 46 per cent of Scotland’s electricity being generated through these means in 2013.

It is estimated that by 2020, more than 20% of Scotland’s total energy production could be generated by solar PV, equal to enough electricity to power over 65% of Scottish households per year, this would also result in a 2.8 million tonne reduction in carbon emissions and the creation of hundreds of jobs for the Scotland economy.

The country is well on the way to its target with recent figures showing two fifths of electricity used in Scotland came from renewables in 2013. The pace of growth has not subsided and while wind has been the main renewable driver, there are plenty of reasons to believe solar will ramp up faster than before. Scotland continues to produce more energy than it uses, with more...
than 26% of electricity generated in the country last year being exported, figures from the Department of Energy and Climate Change showed.

The proportion of power in Scotland generated from renewable sources was significantly higher than the rest of the UK. While 29.8% of electricity generated in Scotland was from renewables, in England the sector produced only 8.2% of electricity, while in Wales and Northern Ireland renewables accounted for 8.7% and 15.9% respectively. Scotland has 10% of the UK population but a third of its renewable energy.

In the past, solar panel technology predominantly depended upon direct sunlight to produce electricity. However, innovative breakthroughs in technology have seen the introduction of ‘solar PV’ cell-based panels that only require daylight to produce electricity—even with the notoriously ‘dreich’ weather in Scotland.

Lightsource Renewable Energy is one of Europe’s leading solar PV electricity generator, producing the equivalent of enough electricity to power over 200,000 UK households.

The company affirms its investment to Scotland with the opening of its new office in Livingston by Energy Minster, Fergus Ewing. At the event, Mr. Ewing stated there is “a significant role” for solar PV to play in Scotland.

Lightsource has already identified around 70 potential sites for ground-mounted solar PV farms, as well as opportunity for commercial and domestic rooftop solar PV systems in Scotland, which would represent a substantial investment into the economy.

The operation of a solar PV farm is extremely passive which makes it ideal for farmland diversification. Once installed, a commercial utility-scale solar PV farm is of no disturbance to farm animals, wildlife or other activities nearby.

The design and layout of the solar PV panels allows for a large proportion of the land to be used for agricultural purposes, such as grazing small livestock.

No flood lighting is needed, there are no moving parts and,
as the solar PV panels are designed specifically to absorb daylight, an anti-reflective surface ensures any reflection of light is minimal. At the end of a solar PV farm’s working life, an installation can be pulled out of the soil and the entire area easily restored to ‘green field’ land.

Lightsource hopes to invest up to £50 million in the region, although they have stated this figure could change due to the new Contract for Difference (CfD) scheme which limits solar PV’s deployment potential as capacity is likely to be swallowed up by onshore wind projects.

On the topic of government support, Mr. Ewing stated “I hope we will see some continuity of policy, and not too much chopping and changing.”

Nick Boyle, CEO at Lightsource Renewable Energy, commented, “The habit of turning on a light, running a bath, or flicking the kettle on is not going out of fashion, and with the UK’s fossil fuels resources’ being depleted in the next number of years, we need to provide home-grown electricity wherever possible. Advances in solar PV technology have seen increased efficiency of panels and reductions in manufacturing costs, making solar PV a viable power source to add to Scotland’s overall energy mix.”

Boyle continued, “In just over three years, Lightsource has deployed over £1.1 billion of UK retail investment into the local renewable energy economy and we hope to continue this momentum through significant investment into projects developed in Scotland as well.”

Lightsource intends to develop solar PV projects in Scotland across a variety of installations to capitalise on the regional growth. These include ground-mounted projects (solar PV farms), commercial rooftops, social housing, schools, and private households. The company sees the region as ripe for development across the PV potential.

Local community engagement is a key factor during the planning stages of a project and Lightsource has pioneered community engagement within the solar PV industry, building strong relationships with local communities throughout the planning and development process of a project, ensuring that each installation is tailored to the local area.

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Towards self sufficiency

ZNSHINE Solar have been building a UK presence and provided details and feedback of a recent PV installation in the Southwest of England which the company sees as showing potential customers that self-sufficiency for the domestic residence is in touching distance.
ZNSHINE SOLAR, a relatively young Chinese based manufacturer of PV modules, has been building its reputation and reach around the globe with production facilities in China, Japan and South Africa. The company recently equipped a residential rooftop installation of 4 kWp in Weston-super-Mare in the Southwest of England. The PV system was installed on a roof of a house in the coastal town, which is located on the Bristol Channel coast in North Somerset, 18 miles south west of Bristol.

The roof is South facing with a 30 degree pitch. 20 ZNSHINE Solar panels were installed, arranged in two strings of 10. The modules are linked to a Powador 4202 inverter, which on the second anniversary of the system reported 8203 kWh of energy generation. The monitoring of the PV system started in 2012.

Andy, the owner of the system, uses approximately 30% of the produced energy for his own needs, 70% are fed into the grid. In the UK all 100% of the energy produced provides returns in terms of FITs.

Andy’s home is a detached house, and his household consists of 4 people, of which 3 are at home all the time. Andy works in his home office all day with all the related home office appliances in use. Therefore his electricity consumption is higher than average. The electricity import compared to users with similar average use and usage patterns could compared as follows: Andy’s home: 18.10 kWh per day; Average Home: 10.20 kWh per day.

During the day applications such as the refrigerator, freezer etc. are completely covered by PV energy (not at night however).
Gradually Andy, is also moving to LED to further improve his house’s energy efficiency. According to Andy, up to 45% of what the house uses comes from the energy generated by the PV system.

Weston-super-Mare has a temperate climate which is generally wetter and milder than the rest of the country. Convective clouds reduce the number of hours of sunshine. Annual sunshine rates are slightly less than the regional average of 1,600 hours. So even though the sunshine conditions aren’t optimal, Andy sees real benefits from his PV system that generates revenues in terms of FITs.

The main financial leverages at the moment for UK systems are still the Feed-In-Tariffs and exportation tariffs. In regards to smaller solar installations like this one, an installation reaching up to a maximum of 4 kWp, the British government has established that new (although lower) rates that will apply starting from January 1st, and specifically 13.88 pence/kWh as Feed-In-Tariff and 4.77 p/kWh as exportation tariff. As net metering is still not implemented for smaller PV installations, the tariff system will operate under the assumption that who applies for the FIT will use 50% for self-consumption and export the other 50%.

In general these incentives mean that new customers and owners of PV plants will be able to play an active role in the fight against climate change consequences and at the same time benefit with a sound, long-term financial investment, with income provided by the generation tariff, saving on the electricity bill thanks to the part used for self-consumption and further income provided by the export tariffs.

Over a 25 year period, the incomes generated by a 4 kWp plant would be expected to double when compared to the initial system cost. This equates to approximately 6% to 8% return on the investment. The introduction of new technologies in the future (such as smart metering) will allow for a more complete understanding of energy usage. This will allow home owners to make informed choices about how they use energy which will lead to steadily increasing awareness of the importance of personal commitment for a sustainable lifestyle. The choices and changes that consumers will be able to make will lead to sizeable benefits in terms of the quicker amortizing of the systems.

Andy has the PV system monitored by a professional monitoring system Wattson Anywhere and Wattson Solar Plus, produced by Energeno. The PV plant feeds data through Optismart Gateway to an online portal dedicated to the PV system, which is monitored in real time. Under a user specific link the PV plant’s energy use and PV generation can be followed live.

Andy commented on his PV installation, “I am delighted to have a PV installation and to be able to generate energy for my own consumption thanks to solar energy. I am very satisfied with the outcome of the PV system and the quality of the technology. Thanks to the PV plant, I have received payments of more than £4200 in two and a half years for the electricity generated and saved over £500 on my electricity bills. With Wattson Anywhere I can see how much money I’m saving when I’m on the go.”

Stuart Brannigan, ZNSHINE, Chief Strategy Officer, commented, “Although this is in fact a very small system and a tiny fraction of the modules we supply into the UK market, this serves as a demonstration of the quality and performance of our products.”

“We are more and more active in the UK market, where we are making great inroads in penetrating both the large-scale installation segment, and through our partners the residential industry with its small-to medium PV systems. We are currently building further relationships with a selection of partners in all segments with whom we wish to reach out to the different market segments.”

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The Urban Community Energy Fund has been launched, giving community groups in England the opportunity to bid for grants of up to £20,000, or loans of up to £130,000.

The number of community owned renewable energy schemes in England is set to increase thanks to a £10 million fund unveiled by Energy and Climate Change Secretary Ed Davey.

The Urban Community Energy Fund will give community groups in England the opportunity to bid for grants of up to £20,000, or loans of up to £130,000 to help kick-start their projects. Community groups can reap the benefits of renewable energy by creating “power hubs” in their area. Installing solar panels on local buildings or factories or building an anaerobic digestion plant to create energy from local waste can save whole communities money.

Sunny Beer
In East Sussex, beer is now being made using the sun’s rays after the south east’s first ever community energy scheme installed solar panels on Harvey’s Brewery. The brewery benefits from lower energy bills, while the community benefits from money back under the Feed in Tariff (FiT).

Announcing the funding on a visit to the brewery, Ed Davey said, “I want to give more people the power to generate their own electricity and by supporting community energy projects we can - helping them drive down their energy bills at the same time. “That’s why we’ve pledged £10 million, so communities can play their part in generating renewable power at a local level. This is all about investing in renewable energy sources, creating jobs and changing the way renewable energy is developed in the UK.”

Community plans
The community energy sector will also see its first major shake-up since the launch of the Community Energy Strategy in January this year. Community electricity projects will now get further support under the Feed in Tariff Scheme – which pays the owners of small-scale renewable generation for the electricity they produce - to get their community energy projects off the ground.

Changes include, for the first time, registered charities which will be entitled to the same benefits as other community groups. Two community projects (or one community project and one commercial project), each up to 5MW, will now be able to share a single grid connection and receive separate Feed in Tariffs. The FiT will now be guaranteed for an extra six months – giving communities more time to get their project up and running.

Welcoming the changes to the FiTs scheme, Kathy Smyth, Policy Director of Community Energy England said, “Without risking the integrity of the wider Feed in Tariff scheme, this will stimulate community involvement in larger renewable schemes. It will be a great boost to projects using the split ownership model under the
voluntary protocol for Shared Community Ownership, which Ed Davey launched earlier this month."

**Registering interest**

In addition to the changes, a Register of Community Benefits and Engagement for onshore wind projects has been launched to help other communities to get the most out of proposed wind developments in their area.

Last month, ethical investment exchange company Ethex found that renewable energy projects are the most popular type of community investment, with £29 million raised for 56 projects since early 2012. The government’s support aims to stimulate further community investment into the renewable energy sector and help the UK achieve 15 per cent of its energy consumption from renewable sources by 2020. The announcements follow the publication of the Shared Ownership Taskforce report on 3 November. The report set out a framework for how developers and local communities can work together to substantially increase the offer of shared ownership of new, commercially developed onshore renewables projects in their area.

**Industry support**

The REA has welcomed DECC’s confirmation that community groups and commercial developers will be able to share a grid connection for jointly developed renewable electricity projects under the Feed-in Tariff. This effectively doubles the size limit for projects developed in this way.

For example, a solar farm 50/50 owned by a commercial developer and a community group can now be up to 10MW in size, instead of the usual 5MW limit. REA Community Engagement Adviser Gaynor Hartnell said, “This creates a powerful incentive, especially for solar project developers, to co-develop schemes with community groups, in just the scenario Ed Davey envisaged when the Community Energy Strategy was published.

“The two parties could share costs on planning and grid connection and follow the split asset model, as set out by the Shared Ownership Taskforce in its recent report.”

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The Solar Cloth Company

THE SOLAR CLOTH COMPANY is being recognised for installing the world-first lightweight, flexible TFPV carport. The company is in negotiations with major retailers, car park operators and constructors to roll-out nationwide.

Commercial properties in the UK, excluding factories, account for 13% of the UK’s energy consumption, and 19% of the UK’s CO₂ output. There are an estimated 834m² of non-load bearing roofing and 353m² of car parking. Both represent potential markets for our lightweight, flexible solar panels worth in the region of £50 billion and £70 billion respectively. What’s more, the vast majority of the UK’s supermarkets and warehouses are covered by non-load bearing roofing that can only support lightweight, flexible solar panels.

The Solar Cloth Company’s lightweight, flexible solar panels are unique in their ability to be installed at low cost onto any roof, thanks to their low-load and flexible polymer backing meaning solar solutions can be built into any type of building. The lightweight, flexible solar panels are made using thin film PV (TFPV), which are state-of-the-art solar cells that weigh less than 3.3kg/m² - a tenth of the weight of traditional solar panels. They can be laid over low-load bearing structures, and bonded to most fabrics to allow application in tensile structures, stadia and agricultural land covers. TFPV are lighter and more powerful than existing silicon panels. Given the 20-year lifetime of our lightweight, flexible solar panels, thousands of additional kWh of energy could be produced and fed into the National Grid.

In addition, the company is collaborating with the University of Cambridge and other leading European universities for multimillion-pound projects to create ultralow-cost-TFPV.
THE AVERAGE SIZE of a PV system is trending upward allowing owners to minimize grid consumption throughout the day. However, this boom in PV generation has also altered the structure of grid operations prompting a number of countries to put in place regulations that limit the amount of PV power that can be delivered to the grid — some have even banned PV systems from feeding into the grid altogether.

In many cases customers cannot justify the economics of a PV system purely for self-consumption or are forced to reduce the size of their desired system to avoid exceeding the local feed-in limit.

The SolarEdge Smart Energy Management solution includes a feed-in limitation feature that enables PV system owners to maximize self-consumption while maintaining compliance with local grid regulations and installation standards.

By enabling customers to dynamically manage the amount of PV power produced so that the power fed into the grid never exceeds the limit the SolarEdge feed-in limitation unlocks a new level of operational flexibility for system owners. SolarEdge's feed-in limitation is integrated directly into the inverter firmware ensuring it maintains the output power limit set forth by the utility at all times. For the first time PV system owners can easily maximize self-consumption when loads are high then feed into the grid when the loads are low without violating local regulations and procedures.
LAKESIDE ENERGY from Waste is a joint venture between Grundon Waste Management and Viridor. Situated close to Heathrow Terminal 5, the facility consumes 410,000 tonnes of London’s non-recyclable waste each year to generate 37 megawatts of electricity.

In an effort to further the environmental standing of the joint venture, BELECTRIC UK was appointed in November 2013 to construct a solar PV rooftop system to generate energy on-site with the express purpose of powering this flagship facility.

BELECTRIC UK is known for its intelligent solar solutions. The company overcame a challenging work environment to install 1,000 solar panels using ropes and abseiling on one third of the south-facing curved roof at the back of the plant. Each year the system generates 230,500 Kwh of sustainable energy, and delivers a saving of 137,000 tonnes of carbon.

Toddington Harper, BELECTRIC UK CEO says “We are delighted to have won this award for such an iconic building. The team worked extremely hard to ensure install this world class 250 kilowatt peak solar power system onto such a unique, tall building, without any disruption or
downtime to the power production on site”.

The purpose of the Solar UK Industry Awards is to recognise best practice, success stories and developments along the entire value chain of the solar industry - from laboratory based technology developments to efficient system installation.

The Awards focus on the people, processes and products that drive the solar industry forward.

This award will be in good company on the BELECTRIC mantelpiece as the Company continues to be recognised for its unrivalled solar developments for rooftops, car parks and solar farms in the UK and internationally.
Conergy UK

CONERGY started 2014 in excellent shape. The sale of the company to Miami’s Kawa Capital Management the previous summer had given the company more financial clout. Conergy closed a deal shortly afterwards with partners Camborne Energy (now 3C) for a portfolio of four planned solar farms in different parts of the country – Norfolk, Dorset and South Wales – sold to London-based investor Primrose Solar before construction had even begun. Additionally three other solar farms were commissioned by different customers for the end of March, a challenging workload.

Conergy had barely recovered from New Year before losing diggers in the winter mud. January was the wettest month on record and DECC was not prepared to extend the ROC deadlines because of the weather, so the pressure was on. The company had to complete the job.

With great support from Conergy’s engineers across Europe, the company installed 68MW of capacity in three months across seven sites. It was an achievement that helped to win the Solar UK Industry Award for EPC Excellence. Anticipating growth, Conergy hired more staff at the main UK offices in Milton Keynes, and at the project development arm bought from Wirsol, well known for its 1.1MWp rooftop project at the Jaguar Land Rover factory in Coventry.

A bank guarantee facility, arranged by Deutsche Bank and worth close to £40m, allowed Conergy to increase the number of projects being worked on at any one time, and bought £200m of projects, including plenty of sub-5MW schemes that would outlast the accelerated transition to CFDs for projects over 5MW.

The summer was dry and good for builds and saw two more solar farms connected – one of the country’s biggest, at 37MW, for utility RWE, and another near Bristol with 21MW, where the local community will get a share of proceeds. By the end of 2014 Conergy will have broken ground on around another ten solar farm projects.

According to Robert Goss, Conergy UK managing director the company expects the 2015 solar farm business to remain steady, and the company is working with partner developers and investors, especially on sub-5MW projects.

Conergy expect to get back into rooftops in a big way, with new offers for commercial facilities and large-scale residential projects, in both private and public sectors.

Each year British solar gets bigger and stronger because it is better diversified. Conergy has taken a lead role in its development, and is looking to a very successful 2015!
Lark Energy
Large Ground Mount Installation Award Winner

LARK ENERGY, working with Armstrong Energy and Hanson Cement, designed, developed and constructed an innovative 9MWp project which brings significant solar power to a major UK cement works. The solar farm was built on 20 hectares of former quarry. The 38,544 modules will generate enough energy to cover around 10% of the Cement work’s annual consumption.

Although planning seemed straightforward, the grid connection looked difficult. Despite the cement works likely to consume all energy, the District Network Operator (DNO), in this case Western Power Distribution (WPD) must plan for the worst case scenario of all the power being exported to the grid. WPD’s suggested that a significant upgrade was necessary. The costs of the proposed upgrade would have made the project unviable. The project partners came up with a solution utilising the cement works’ internal 11kv network and active power management.

The power from the solar farm connects into Hanson’s private 11kv network on three separate circuits. This means that individual switchgear and transformer sets are required for each circuit. The 11kv network then connects to WPD’s 33kv public grid network via a step up transformer. Various upgrades of the customer and DNO substations had to take place to enable the connections.

The Ketton solar farm benefits from active and reactive power management and protects the grid from reverse current. This design minimised the need for upgrade work on the 33kv grid and enabled the inverters to be used as capacitor batteries at night.

Reactive power is present when the voltage and current are not in phase. Transformers, transmission lines, and motors require reactive power. A supplier/source close to the location of the need is in a much better position to provide reactive power and therefore onsite renewable energy is perfectly placed to provide cost-effective reactive power to the user which results in reduced supply costs and helps smooth grid voltage. A certain amount can also be stored in the capacitors and released at night. Lark Energy exploited the benefits of the inverters ability to automatically match grid voltage, whilst independently changing its power factor to improve grid stability during rapid generation and load changes. At Ketton, the inverters act as a compensator with in-built capacitor bank, to reduce voltage variations during rapid changes in generation or load, even when not generating real power.

The solar scheme at Ketton provides real time reactive power to compensate for the large reactive power loads from the Cement Production Plant. Construction started in the autumn of 2013 and connected to the grid on schedule in December 2013.

Finlay Colville of NPD SolarBuzz presents the award to Jonathan Selwyn, MD of Lark Energy
IN 2013 Energy and Climate Minister Greg Barker announced a new UK Solar PV strategy that involves developing government estates, factories, supermarkets, commercial premises and car parks into ‘Solar Hubs’.

However, developing large buildings into power stations requires substantial amounts of investments to generate sufficient solar energy. With many companies having budget reviews for the upcoming year, concentrating on different areas for the business, solar projects may not currently be at the forefront of their plans. With this in mind, and as a direct response to clients who dislike the ageing, contractually restrictive PPA’s, Solar Advanced Systems have worked hard in developing their “RIOS” scheme for commercial companies that allows the installation of a maintained and operated Solar PV system with zero capital investment.

The client will remain cash positive from year one, allowing them to benefit from reduced utility cost and the government backed Feed-In Tariff whilst retaining a flexible exit strategy. Greggs were the first commercial client of ours to install with RIOS. The scheme has been in the pipeline for almost 12 months, making sure the model would fully benefit the client and see them cash positive from year one.

The scheme was first proposed to Greggs back in April last year and they have already seen a great return from the Fit’s along with a great reduction in both utility costs and their carbon footprint.

When their customers choose to install with the RIOS finance package, the company promises to maintain their system throughout the 25 years that it generates energy. Furthermore, offering to own the system on their behalf. This eliminates them from having to maintain the system themselves should a panel or inverter need replacing. They still fully own the solar-generated electricity and FITs; we just take care of the maintenance and upkeep of the system.

Many companies having a similar finance package to RIOS. However, what stands out from the other companies is the operation and maintenance support program given with every installed system. With clients looking at Solar Advanced Systems to look after their systems for the next 20 years the company are confident they will be here in the years to come supporting the 20 by 20 campaign.

Solar Advance Systems are now taking this finance scheme to many commercial, agricultural, public and community sectors and already have over £5.9m in orders ready to install.
EFFICIENCY OF PHOTOVOLTAIC devices is limited by reflection losses. In PV module the light enters the cell through the glass and the reflection of light from the outer glass surface represents an immediate optical loss. These may result in about 4% of the solar energy loss at the PV module surface.

The most commonly used techniques to reduce the reflection include texturing of the glass surface and the application of an Anti-Reflective Coating (ARC). The simplest ARC consists of a single layer of refractive index matching material. The problem is the availability of material with a refractive index lower than glass.

Multi-layer AR (MAR) coatings are widely used in the Ophthalmic industry to reduce the reflection and glare on spectacle lenses. They are also used in precision optics for a variety of applications including increasing the transmission on camera lenses.

These MAR coatings are designed based on a high/low refractive index materials pairs. In our study we used silicon dioxide (SiO₂) as the low index material and zirconium dioxide (ZrO₂) as the high index material. The choice of these materials was dictated by the durability and cost of the materials.

By careful design of the thickness of each layer in a multilayer stack we were able to minimise the reflection losses down to 1.22% from 4.22%. This translated to 3.6% relative increase in efficiency of a thin film CdTe solar cell.

The PV market size was ~38GWp in 2013. If performance of all sold PV panels could be improved by 3.6% the installed panels would have 39.36GWp. A 1.36GWp increase, this is comparable to the size of the PV market in 2005.

These dielectric metal-oxide materials are hard and scratch resistant and adhere well to glass surfaces. Their durability and environmental stability is exceptional and already well proven in the ophthalmic and precision optical applications even on plastic substrates. The cost of such a broadband MAR coating for solar modules could be dramatically reduced if deposited at high volumes using high material utilisation rotating magnetrons by a glass manufacturer.

The sputtering process developed in this study is capable of scaling to an industrial level. The durability and environmental stability of multilayer dielectric coatings is well established and will not be an issue for manufacturing warranties even when modules are subject to regular cleaning cycles.
Thank you to all involved in the 4th Solar UK Conference.

A fantastic day of networking, awards and educational papers, with industry specialists such as BRE, Solarbuzz, Centrica Energy, Belectric UK, Conergy giving their perspectives on the solar UK industry.

Industry specialist such as Ray Noble gave the Government view point and SGH Martinaeu the legal frameworks for operation to name a few. Other speakers included the BPVA, Gruptec, Neas Energy, EY, 2F Capital Ltd Regen SW & Jason Hunter.

If you would like to be considered as a speaker for 2015 please contact Jackie Cannon on:

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Latest renewables innovations to debut at Ecobuild

Ecobuild is the UK’s largest energy conference and exhibition and continues to develop a programme for developing sustainable energy into the foundation of the nation’s buildings. Solar UK takes a look at what to expect in March at the event.
THE WHOLE UK SOLAR PV VALUE CHAIN will unite at Ecobuild next March (3rd to 5th March at London’s ExCeL) to learn about the latest policies, legislation and technological innovations to grow their businesses. Supported by The Solar Trade Association and British Photovoltaic Association (BPVA), Ecobuild is the UK’s premier energy event attracting over 18,000 senior energy professionals and showcasing the latest products and solutions from over 125 energy brands.

Top of the bill for solar professionals will be SMA Solar, Panasonic, Sharp, BayWa r.e, and Zenex.

Delivering more professionals with an interest in renewable energy and energy efficiency than any other event in the UK, Ecobuild plays host to the full spectrum of renewables technologies; Solar PV, Solar Thermal, Heat Pumps, Biomass, Wind, Energy from Waste, Geothermal, CHP and Biogas/AD.

So what are the hot themes at Ecobuild?

From energy storage to the Renewable Heat Incentive and other renewable issues, Ecobuild’s seminar programme will provide tailored sessions to cover the entire supply chain, from manufacturers and installers and builders and developers and end-users procuring solutions across the public and private sectors.

Solar City in association with SMA Solar returns for 2015 to cover both residential and commercial projects. For those picking up residential PV contracts, key sessions include how to achieve mass market appeal, the energy independent home and the business case for large scale roll out.

For solar professionals bidding for large scale PV projects, sessions on policy, planning and overcoming barriers and public perception and engagement are a must-attend.

These sessions are particularly pertinent following the UK Department of Energy and Climate Change announcement that it will remove support for Renewable Obligation Certificates (ROCs) earlier than planned. Large Scale PV plants over 5 MW were originally set to receive ROC subsidies until 2017.

However, the deadline to have new systems up and running has been moved to April 1, 2015. System developers and investors face the challenge of meeting the existing requirements for planned PV projects by March 31, 2015, otherwise they will have to apply for support under the new mechanism Contracts for Difference (CFD).
Local awareness

Ecobuild exhibitor SMA Solar Technology AG (SMA) is one business actively responding to large scale PV system developers and investors in the UK to complete their PV projects before the subsidy changes in April 2015.

“With our complete package, covering everything from the String-Combiner to the grid connection, we want to ensure that our customers in Great Britain can implement their photovoltaic projects quicker and without any complications. In addition to expanding our system solution to include the grid transfer station, we are also shortening delivery times and supporting project developers and investors with technical advice and a full range of services,” said Boris Wolff, Executive Vice President of the Utility Business Unit at SMA.

According to Wolff, SMA plans to add the grid transfer station to the system solution and launch it in additional markets over the medium term. On the commercial side, sessions on commercial rooftops are set to attract a crowd; from unlocking the potential for PV and understanding the business case to practical implementation case studies. The potential for energy storage to be the “missing link” in both accommodating increased distributed generation and protecting the grid has been long talked about so Ecobuild will also host special master-classes on energy storage and grid management which will include an innovation and technology showcase.

Paul Barwell, CEO of the STA recently said, “The Solar Trade Association’s strategic objective is to get solar PV to zero subsidy across all submarkets – domestic, commercial and large-scale –by the start of the next decade. That is the goal – the glittering prize at the end of the tunnel, for both the industry and the Government. And I am convinced we will get there! We will have more details on this strategy early next year.”

The Green Energy Zone is also back for 2015. Sponsored by Innasol, seminars will cover the specification and delivery of low and zero carbon energy technologies to homes and other buildings. It also looks at energy supply at the community level. Topics will include determining the most cost effective technology for specific applications, meeting regulations, leveraging the feed in tariff and renewable heat incentive. This stream examines the different energy technologies and how to specify these and the latest technical developments including energy storage.

For renewables professionals also serving the lucrative biomass and heat pump markets, Practical Installer is back, ‘business clinic’ style as Plumb Center’s experts help put profit in the pockets of every installer, whether just setting up, surviving or thriving in the renewables market. Acting as the business hub for Ecobuild’s Energy Section, will cover ‘quick wins’ to full solution installations with Plumb Center renewables experts delivering tailored business advice to all installers – the seasoned MCS-accredited installer and gas installers keen to break into the green energy market.

Why attend?

Ecobuild understands that taking a day off the job is an investment to installers and this is why we work to deliver both the technological innovation and business skills installers need to be equipped with in order to compete in this space. As in
any industry, if you’ve been working with a particular partner or supplier for a number of years, you will have built up a trusted relationship and feel you are clued up on their latest solutions and are getting the best deal possible. What I want to put out there about Ecobuild, is it gives solar professionals the chance not only to look with fresh eyes at their existing partnerships and new solutions they might not be aware of, but also to check out the latest innovations flooding onto the market from the industry’s top suppliers conveniently housed under roof.

Spring is also a critical time for installers to get up to speed on the latest training and technologies to make commercial and domestic premises more energy efficient ahead of the winter and Ecobuild is perfectly timed to provide this.

Soaring energy prices and falling Feed-In Tariffs also means that installers and the energy community must get properly up to speed on policy and legislation and how to leverage live government incentives such as the Domestic Renewable Heat Incentive (RHI). Knowledge is power if installers are to diversify and grow their businesses by capitalising upon investments.

Exhibitor feedback

Ahead of the show, Solar UK talks to a range of exhibitors set to showcase their latest innovations and share new thinking.…… Joining the discussion are experts from SMA Solar, BayWa r.e and the Solar Trade Association (STA).

Q. What are the key trends you are seeing in the solar market and what does the next 12 months hold for your industry?

Ben Robinson, Business Development Manager, BayWa r.e said, “We are assisting with the design of more commercial systems, often looking at export restriction in order to satisfy the DNO requirements, and ensure the suitable system sizes are installed on a roof in order to meet the electricity demand on site. We are also working closely with BSI in regard to storage and have seen a marked increase in the interest from the domestic sector for battery storage and energy management solutions.”

BayWa.r.e will be showcasing its Novotegra mounting solutions both for the commercial and domestic sector and its accompanying Solar Planit design software – a simple to use online system that generates the layout and loading calculations along with the bill of materials for easy purchasing. They will also be showcasing their energy storage systems from their inverter suppliers and high efficiency modules from the likes of LG and 54 cell modules from Hyundai.

Q. What are the current challenges and opportunities to manufacturers and distributors of solar technology?

Next year is going to see a shifting political landscape thanks to the election and the new Government, so we will need to respond to that” says STA’s Barwell. “On the agenda for 2015 is a push to expand and remove the barriers to the commercial rooftop sector, defending and expanding growth in large-scale solar, ongoing work on solar thermal and on new build homes – not to mention the review of the FiT. And last but not least we are going to be unveiling a new STA logo! All of this will keep us busy indeed.”

Robinson added, “We expect that there will be some consolidation in 2015 and no doubt some exits/casualties especially from those distributors without a robust balance sheet or marketing strategy beyond price based selling to fall back on. The new build sector is definitely picking up as PV is specified to help meet planning requirements but fluctuations in the Euro along with product origin concerns still keeps us on our toes!”

Q. Where are the opportunities in the UK market for solar?

Robinson, “There is still a strong domestic demand and we hope that it will continue as we come out of recession and electricity prices are no doubt increased. The larger commercial rooftop installations are slowly happening (once leases are eventually signed!) and storage is becoming a hot topic as customers want to make the most of the PV electricity that they have generated. There will obviously be a rush to install larger ground mount systems before the ROC deadline but in reality, most of these deals should be finalised by now or at least nearing their final contract negotiations.”

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One of the most neglected electrical products used in industrial automation is the humble inverter. Rarely is a piece of equipment so straightforward and reliable that process engineers forget it exists. Here, Jonathan Wilkins, the marketing manager of obsolete and spare industrial automation parts supplier, European Automation, explains why even the most resilient components sometimes fail and what to do when this happens.

INVERTERS, DRIVES, VSDs, variable speed drives, variable frequency drives – the category of products used to control an electric motor’s speed and thus reduce energy usage in a variable speed application has more names than Prince. Although, I suppose when you think about it, he only has three really, if you include his decision in 1993 to become known by a symbol instead of a word.

Power inverters can be completely electronic or combine mechanical effects with electronic circuitry. Since inverters convert...
Ultrasonic vibrations

The final problem on the list is one that contributes to the mechanical stress placed on an inverter. Ultrasonic vibrations originating in the cores of inductive components cause friction, adding to the unwanted heat generated by the device and further damaging components in the inverter.

As with any electrical equipment, maintenance is the key and mustn’t be overlooked. With time, electrical connections tend to loosen or corrode. If the inverter is still functional, a maintenance manager might be tempted to simply ignore these signs of wear and tear. However, as the saying goes, it’s better to be safe than sorry, so cleaning the terminals in the battery box, fuses and the inverter connection at least once every six months is crucial. Furthermore, the cleaning process has to be performed correctly, or it might end up doing more damage than good. Ideally, a wire brush and grease dissolvent agent should be used. After cleaning and maintenance is complete, a protective sealant must also be used on all battery terminals. When deciding which protective coating to use, avoid grease-based ones, because they tend to attract contaminants like dust, which leads to an increased decay of the connections, while also hiding the degradation from further visual inspections.

Although correct installation and maintenance can significantly prolong the lifespan of inverters, when failure does happen, there are a few routes you can take. Especially for older or obsolete models, it might be worth considering the purchase of a refurbished part. Purchasing carefully refurbished parts from trusted suppliers is an excellent way to minimise your costs and ensure your operation is up and running in no time. When European Automation buys a drive for future re-sale, we repair or refurbish it so it’s completely problem-free.

So, don’t suffer in silence. If you are baffled by a broken drive, confused by the countless ways to control an electric motor or even just perplexed by Prince’s name choices, get in contact with European Automation. We promise not to change our name to a symbol.
SAFETY IS PARAMOUNT in any electrical installation but solar and PV installations come with specific challenges for the installer and longer-term steward of an installation. The future of the solar industry is as dependent on public support as much as finance and ensuring the highest safety levels ensures that PV stays safe in the mind of the consumer.

You would think the safety needs of a solar array would be obvious but there are still examples around the world where safety shortcuts have led to dangerous problems. Here is the ten most important reasons to continually test solar arrays.

**Compliance with IEC 62446**

IEC 62446 recommends that periodic verification of an existing installation shall be performed. The standard defines the minimum requirements for system documentation, commissioning tests and inspection for PV systems. As such, this standard not only specifies the minimum electrical testing and inspection requirements but equally importantly how the inspection and test results are documented and supplied to the consumer after installation.

Where appropriate, the results and recommendations of previous periodic verifications shall be taken into account. A periodic verification report shall be provided and include a list of any faults and recommendations for repairs or improvements (such as upgrading a system to meet current standards).

**Avoiding fire risks**

As the number of rooftop solar installation systems have grown over the years, so have the number of reported incidents of fires. Household fires started by electrical faults in rooftop solar PV systems have been reported in the UK, Australia, the USA and France – among others. The periodic testing of the electrical cabling and components associated with solar PV systems will ensure the safe operation of the system and reduce the potential fire risk associated with any electrical faults.

**Effective grounding**

As with all electrical equipment, solar panels and their racking systems must be grounded to mitigate potential electric shocks and fire hazards. If the grounding system degrades over time, anyone who comes into contact with a metal piece of the system may receive a shock. While the likelihood of shock is low, should one occur, the chance of substantial injury is great, because of the high voltage arrays, and the added danger of falling from roof mounted systems.

**Ground faults**

PV systems, in particular large scale systems, have many metres of cabling,
much of which is buried underground. Poor levels of insulation will allow energy generated by the PV system to leak to earth. This can be particularly problematic during damp or wet conditions where the insulation monitoring or residual current monitoring function within an inverter prevents the inverter from starting up which in turn can significantly reduce the operational efficiency of the PV installation.

**Environmental degradation**

Connectors caused by moisture ingress can result in degradation in performance or increased risk of fire. Regular electrical testing will enable system performance to be monitored and any necessary repairs or remedial actions to be taken.

**Surface contamination and physical damage**

PV modules can become dirty or contaminated over time and this can reduce the operational efficiency and system performance. Similarly, exposure to the elements can result in physical damage to the component parts of a PV installation. Objects dropped by birds can result in physical damage to PV modules which may result in reduced output performance. Periodic electrical testing as part of regular maintenance will enable any problems to be identified and diagnosed.

**Damage to wiring**

The most obvious example of bad wiring is when wires hang below the panels and touch the roof or underlying vegetation. Eventually the wire coating will wear or be damaged by rodent attack and potentially expose the copper wires, presenting a shock hazard. Any deterioration of cable connections and wiring can be identified by applying regular electrical testing to identify potential faults.

**Verification of system performance**

The installation of solar PV systems is only undertaken after careful consideration of the costs involved and the potential return on investment provided by lower energy bills and FIT payments.

As a result, the verification of system performance and energy output from the panels is particularly important. In many cases simple electrical faults or wiring failures can cause a serious inefficiency in the ability of the panel to produce power.

Although proper metering will give an indication of system performance, periodic electrical testing is vital to verify ongoing functional performance over extended periods.

**Warranty fulfilment**

Periodic electrical testing of solar PV systems to identify and confirm continued safe operation and maximum energy output performance can be required as part of product warranties and PV system component guarantees.

**Customer documentation**

All solar PV installations require the provision of various documentation and forms to the customer. System documentation usually includes system data, installer details, electrical diagrams, operation and maintenance instructions and other information that may be required by certain standards or regulatory bodies. Copies of all test and commissioning data should also be provided and as a minimum this should include the results from the electrical safety and verification tests undertaken as part of the system installation procedures.

This list can serve as a simple checklist for anyone interested or involved in solar and PV installations.

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Powering the Future of Energy Innovation and Investment

The World Future Energy Summit (WFES) is returning for its 8th edition – as part of Abu Dhabi Sustainability Week (ADSW), the largest sustainability gathering in the MENA region.

WFES is a must-attend event for policy makers, solution providers, strategists, investors and innovators looking to connect, get practical guidance and enhance their presence in one of the world’s largest future energy markets.

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