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SOLAR THERMAL SOLAR PV BIOMASS HEAT PUMPS WIND HYDRO July/August 2016

What does Brexit mean for renewables?

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Is it green for go?

So the renewable energy industry faces a fresh period of uncertainty following the Brexit vote. The implications will become clearer over the coming weeks and months as the policies of the incoming Government begin to take shape.

In this issue of Renewable Energy Installer, we try to make sense of the future landscape for the market and the likely implications for all those involved from the manufacturers, through to the installers and consumers.

From talking to those in the industry, the immediate effects are negative as the value of the pound drops the cost of installations rises. We're hearing first-hand accounts of how the plunging exchange rates are adding up to £1,000 on to the price of renewable energy systems.A period of calm on the money markets will filter through to the industry and yet again the sector will pick itself up, dust itself down and drive forward – it's an industry that continues to survive despite the obstacles because it offers a real difference to consumers, driving down energy bills and allowing homes to become more sustainable.

Many commentators were asking what would happen to the legally binding EU renewable energy targets for 2020, should the UK vote to leave the European Union Interestingly, an analysis report from the National Grid last month revealed the UK will almost certainly fall short on its agreed targets to decarbonise the energy sector and boost the percentage of renewable energy in the energy mix. So whether we voted in or out, the policies of Energy Ministers and decision-makers has failed to deliver the promised results.Now we must wait and see if the new Government will ratify its pledge to Paris Climate agreement and increase its support for renewables.

Editorial panel members

Contents

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In brief

Investor acquires BSR solar parks
Cubico Sustainable Investments, a global leader in renewable energy and water investment, has announced that it has acquired 10 UK operational solar projects totalling 65MW from the UK's largest fully integrated solar developer, British Solar Renewables (BSR).

The acquired portfolio is principally located in the South West of England but also includes Scotland's largest solar park in Angus. BSR will remain actively involved with the solar parks as the operations and maintenance provider.

NIBE celebrates 10th anniversary
A decade after launching its market-leading range of air source, ground source and exhaust air heat pumps in the UK, renewable heating specialist NIBE Energy Systems is celebrating its tenth anniversary.

Since it set up as a UK company in 2006, NIBE has grown from a one-person business to a major player in the renewable heating sector, employing 30 people at its Chesterfield headquarters. The company is also operating training facilities at four sites across the UK.

Offshore wind costs to fall
Nine major energy companies and the Scottish Government have announced a £7.9 million collaboration on technology innovation to slash the cost of offshore wind, via the Carbon Trust's Offshore Wind Accelerator (OWA) programme.

Some of Europe's largest offshore wind developers – DONG Energy, EnBW, E.ON, Iberdrola, RWE, SSE, Statkraft, Statoil and Vattenfall – have signed up to the initiative to help reduce the cost of offshore wind to below £100 per MWh by 2020.

Business urged to invest in renewables amid falling energy costs

Energy prices fell by 4.8% during 2015, mainly due to lower gas prices, according to the latest data from the Lorien Energy Index (LEI).

The data for the first and final quarters of 2015, which tracks the overall cost of energy for business users, shows prices declined by 7.7% compared to the same period in 2014.

Burton-based Lorien Engineering Solutions, which produces the Energy Index, said gas prices fell 22% in the final quarter of 2015 compared to the same period a year earlier. Electricity prices remained relatively static.

The latest LEI graph includes a projected 'best-fit line' and linear projection looking forward. Together, the lines demonstrate that while prices are low, there is an opportunity for companies to invest in energy efficiency, low carbon and renewable technologies. This can position organisations to deal with changing conditions and provide enhanced business resilience over the longer term.

Lorien's sustainability consultant Tom Jordan said: "It isn't an easy task to make forecasts on energy prices at the moment.

"Organisations are seeing a changing landscape slowly unfolding. Business resilience efforts must now include planning for scenarios such as extreme weather disruption, changes to carbon taxes, tightening legislation and longer term uncertainty over base energy costs to the business."

Jordan added that Fatih Birol, Executive Director of the International Energy Agency, echoed the sentiments of many when she said in May that 'despite its great benefits, there is a risk that in the context of low energy prices, attention will shift away from energy efficiency, but that would be a grave mistake'.

Unique community energy cooperative is launched

An innovative new community energy project focused on farm-scale wind turbines in Wales and Scotland has been launched by Sharenergy.

The Small Wind Coop offers people the chance to support three community turbines: one at Troed y Bryn in Ceredigion, Wales and two at Wemyss Bay, Inverclyde, Scotland – the first time a community energy project has brought together farm-scale wind projects in different countries within the UK.

Members of the Small Wind Coop will also be able to nominally use the energy generated by the turbines in their homes and businesses if they sign up to Co-operative Energy for their energy supply thanks to its 'User Chooser' tariff.

Small Wind Coop is offering two types of investment: bonds, which have a return of 4.5% and will be repaid after six years; and shares, which offer a projected average annual return of 6.5 % over 20 years and entitle people to become members of the co-operative and have a say in how it's run.

Thanks to the Government's new Personal Savings Allowance, for most people the returns will be tax free.

Work starts on first UK offshore wind tower factory

Work on the UK's first offshore wind tower factory has officially started.

CS Wind UK's base in Campbeltown, which employs 175 people, is set for a £27 million investment after its acquisition by South Korean manufacturer CS Wind Corporation in April. It is expected to create 160 new jobs at the factory.

Highlands and Islands Enterprise (HIE) has invested in the establishment of the wind factory at Machrihanish over the past 15 years. From 2011, SSE operated the plant, with investment from HIE, as a key operator for the UK renewables supply chain and one that would ultimately attract a large inward investor.

Douglas Cowan, Director of Strengthening Communities at HIE, said: "We are delighted to welcome CS Wind UK to Machrihanish, which is now firmly on the UK renewables map. We very much welcome the plans for such major investment in this rural location and relish the prospect of continuing to work with the company, and exploring opportunities to support its growth plans."

CS Wind has factories in China, Vietnam and Canada, and has already manufactured more than 6,000 towers worldwide.

Council sets sights on becoming green energy capital of London

Barking and Dagenham Council has powered ahead with its bid to become the green energy capital of London after councillors agreed to establish an energy services company to develop heat networks across the borough.

By establishing B&D Energy Limited the council aims to cut the borough's carbon footprint and generate savings and investment for the local community.

Leader of the Council Darren Rodwell explained: "Our 15-year strategy aims to reduce fuel bills for local residents and to address fuel poverty. We want to move from being a borough that gets just 2.5% of its energy from renewable sources – the London average – to one that by 2025 gets over 25% from low carbon, decentralised and renewable sources."

The council has surveyed every building within the borough – 72,000 residential and 4,200 commercial buildings – for energy characteristics and is taking steps including informing residents about opportunities to switch to cheaper sources of fuel, introducing energy savings measures and insulating the most energy-wasting buildings.

B&D Energy will accelerate the council's sustainable energy ambitions by investing in low carbon energy generation projects that will support economic development, reduce social inequality, improve environmental performance and generate income for the council.

Unique electrical safety tool gains design copyright

A simple but effective tool, originally designed by Electrical Safety First to help trading standards identify potentially dangerous or counterfeit electrical items, has just been granted a design copyright.

As part of the charity's work in supporting enforcement agencies, Electrical Safety First created a UK plug checker, as defective or foreign plugs can often indicate that a product is fake or sub-standard. The tool has proven so successful with Trading Standards Officers that it has now been distributed to every Trading Standards office and Fire and Rescue Service Centre in the UK.

Rooftop solar installations face crippling tax hike

The Solar Trade Association (STA) has uncovered that business rates taxes on commercial rooftop solar installations will rise by between six and eight times as of April next year unless Ministers intervene.

Paul Barwell, CEO of the STA, warned the potential of the huge increase will affect both existing and new projects and in some cases actually send installations into negative returns.

He said: "We therefore need Ministers to step in as soon as possible. The system needs to recognise that solar is a unique technology with both costs and revenues having come down over the last five years. This has created a complete mis-fit with the business rates system that needs to be fixed, or else we will face a prohibitive tax hike in this sector."

The change is due to a wider re-evaluation of business rates that takes place every five to seven years, where the Valuation Office Agency looks at how assets are valued, the income they generate and how costs have evolved.

This does not affect domestic solar homes – only businesses that have solar on their roof, where they own the system and installed it with a view to using most of the electricity themselves. Public authorities, schools and community buildings that have solar on their roofs are also at risk of being affected by this tax rise, although there are exemptions, including some agricultural buildings.

UK solar industry sets new generation records

The Solar Trade Association (STA) has celebrated a new record as it launched its latest initiative to raise standards in the maintenance of big rooftop and ground mount solar systems.

It is estimated that the UK now has almost 12GW of solar PV, across homes, offices, schools, warehouses and on solar farms. This is enough to power the equivalent of 3.8 million homes and new analysis by MyGridGB for the STA has shown that solar generation peaked early last month at 23.9% of UK electricity demand – a new record for the UK.

According to the latest statistics, there are currently just over 800,000 homes with solar PV and 200,000 with solar thermal.

The STA is keen to raise awareness of the fact that good quality operation and maintenance (O&M) of commercial solar rooftops and solar farms is essential to ensuring their performance, longevity and safe working condition. It wants to ensure that the sector goes beyond minimum standards and establishes best practice to raise the bar, and has launched its new initiative, Raising Standards in Solar PV Operations and Maintenance. This builds on the work that EU-level body SolarPower Europe has done in its own O&M Best Practice Guidelines.

Eco-friendly student digs

Global construction and programme management consultancy Turner & Townsend has been key in building one of the UK's largest and most eco-friendly student accommodation projects, at the University of Hertfordshire.

The £120 million project, which is due to be completed in time for the start of the new academic year in September 2016, will provide 2,500 new bed spaces and 500 refurbished bed spaces on campus. The scheme includes the construction of a range of three to six storey timber frame accommodation blocks, new sports pitches, gym, informal learning and social spaces, and dedicated bus interchange.

Turner & Townsend initially developed the feasibility study with the University and then led the technical workstream for the procurement of this Public Private Partnership. During the final stage of the project the global consultancy is acting as Independent Certifier, supporting the University to deliver the project and interface with the Project Sponsors' joint venture client, Uliving@Hertfordshireplc. Investors include Meridiam, Bouygues, Derwent Housing Association, Legal & General and the University of Hertfordshire.

The project is BREEAM Outstanding and is working towards achieving True Zero Carbon accreditation, the first of its kind in the UK, thanks to a new biomass fuelled energy centre. The Combined Heat and Power system at the heart of the development will provide energy for a significant portion of the campus.

SOLARWATT seeks UK partner network

SOLARWATT, the leading German pioneer of high-performance dual-glass solar PV production and storage systems, is developing a partnership network to bring its advanced renewable-energy generation and management systems to homes across the UK.

The expansion programme is led by Pol Spronck, recently appointed SOLARWATT International Sales Manager, who has worked in the solar industry since 2008. He has been talking to installation and building design professionals to supply the company's products.

With 23 years' experience and employing more than 200 people at its cutting-edge manufacturing and logistics centre in Dresden, SOLARWATT is expanding following a substantial investment by Stefan Quandt of the family that owns BMW. Solar power is gaining traction due to carbon reduction obligations and concerns over energy costs and fuel security – boosted by technology advances such as SOLARWATT's ground-breaking MyReserve storage system.

Whatever incentives are available, installers and customers are expected to respond to SOLARWATT's premium product portfolio and 100% guarantees. Fixing energy costs, locking in savings by storing and using energy from solar panels rather than feeding it back into the grid, is likely to become more attractive as fossil-fuel prices continue their long-term upward trend.

Installation and design partners will benefit from training and certification, PR and marketing support and SOLARWATT branding.

Wave energy firm links with university for scholarship programme

Wales's leading wave energy company has entered into a collaboration with Swansea University to develop a mechanical engineering PhD scholarship that will provide a successful student with the opportunity to help progress production of the firm's innovative wave energy converter (WEC).

Swansea-based Marine Power Systems (MPS), a company developing revolutionary technology designed to harness wave energy, has joined with the university's Knowledge Economy Skills Scholarship (KESS) II programme to investigate the underlying physical principles of hydrodynamic interaction between wave energy converters.

Biogas grows 30% in a year to power 800,000 homes

Almost a third more biogas energy is being produced in the UK compared to this time last year, according to new figures from industry trade body ADBA.

The AD Market Report, published at UK AD & Biogas 2016, shows that the UK now has 617MWe of biogas capacity, enough to power the equivalent of 800,000 homes.

However, the report also warns that growth in the industry has slowed, and will slow further in each of the coming four years due to Government policy decisions and investment uncertainty. Recent Government moves have reduced the new AD energy generation capacity that ADBA expects to be installed by winter 2018 by 250MW.

In particular, small-scale farm AD is being reduced to a handful of plants being constructed per year, despite the Committee on Climate Change recommending that it should be used to meet carbon budgets. The Government is on course to close renewable electricity incentives to new AD applications in 2018.

The ADBA Market Report shows that there are still over 400 plants with planning permission granted or applied for, illustrating the strength of the pipeline which could be delivered with the right support.

Charlotte Morton, Chief Executive of the Anaerobic Digestion and Bioresources Association, launched the report. In her speech to delegates at UK AD & Biogas 2016, Morton said: "The latest ADBA Market Report shows just what has been achieved by the AD sector. Almost a third more capacity in the past year; double the number of biomethane to grid plants; enough capacity to recycle over two million tonnes of food waste.

"However, our report also shows an opportunity at risk. Using existing technology and feedstocks, the AD industry could be four times bigger than it is today – but Government decisions to scale back electricity support, and uncertainty over heat and waste policies, mean that we could lose as much as 250MW of potential capacity over the next two years. That's enough to increase our tight winter electricity capacity margin by 10%."

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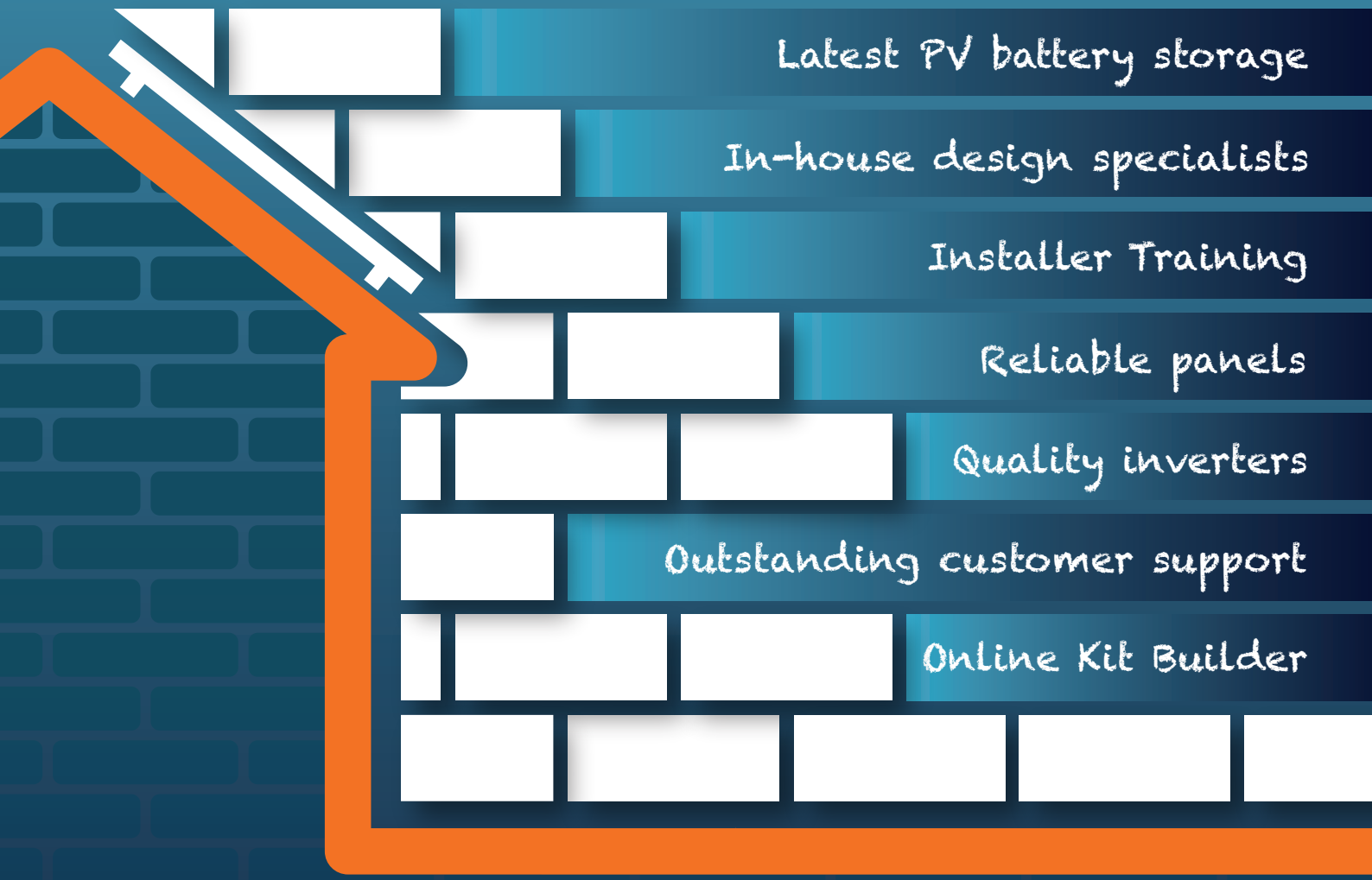

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Analysing the energy cost of the Brexit vote

Energy prices could rise by as much as 30% by 2020 following the UK's decision to leave the European Union. **Nick Proctor**, Managing Director of amber energy, explains what the influences are and warns business owners not to be fooled by those that may blame Brexit for political gain...

The global economic outlook

Lower prices 1–0 Price hikes

It is tough to forecast how the UK leaving the EU might influence the global economic outlook but the consensus seems to be that there could be a negative reaction and a drop in UK GDP.

Even if this were the case, however, the impact of any economic downturn in the UK would make little difference to the world oil markets. As Goldman Sachs explains: "If we assume a 2% drop in UK GDP in response to the exit vote, which is on the high end of our economists' estimates, then UK oil demand would likely be reduced by 1% or 16,000 barrels per day, which is a 0.016 % hit to global demand."

Verdict: In other words, the impact would be minimal but would marginally favour a potential decrease in energy prices.

Pan-European energy infrastructure

Lower prices 1–1 Price hikes

For several years, the European Commission has been investing heavily in creating a pan-European energy infrastructure, which would allow energy to flow freely across the EU with no technical or regulatory barriers. The idea is that this will facilitate a truly free market, keeping prices competitive and allowing the area to fulfil its renewable energy potential.

As things stand, it is unclear whether the UK will opt to stay within Europe's internal energy market. This will likely form part of negotiations around the terms of an exit. However, given that the project is more about having the right infrastructure in place it is unclear that this would lower energy bills anyway. As a result, it is impossible to say what bearing this would have on energy prices going forward.

Verdict: Given the uncertainty and the fact this is more an infrastructure project for now, its effect on energy prices has to be regarded as neutral at this stage.

The cost of gas

Lower prices 1–2 Price hikes

True to its EU commitments, the UK produces around 50% of its electricity from gas now. Despite our historic relationship with coal, just 6% of our energy production comes from coal.

The majority of this supply (54%) comes from Europe and another 15% from outside Europe. As the value of sterling has plummeted post the Brexit vote, the cost of importing this gas has increased.

Verdict: Unless the value of the pound recovers, the cost of gas will increase.

The future of Hinkley Point

Lower prices 2–2 Price hikes

The future of the much delayed Hinkley Point C nuclear power station, which would deliver a 3,200MWe nuclear power station in Somerset, potentially lowering energy prices long term, has naturally been questioned since the Brexit vote.

On balance this is a close call that would probably have to go to penalties. Essentially the chairman at EDF has said Hinkley Point will go ahead despite the EU leave vote. We should indeed expect investors to consider investment in the UK on its own merits; if there is a good deal to be done global firms will likely take them, history tells us. However, the project could do without further delays and the uncertainty created by the Brexit vote means it is a tough one to call.

Verdict: The UK needs Hinkley Point to go ahead and it seems likely, but it could be further delayed.

Great Britain's bargaining potential

Lower prices 2–3 Price hikes

As the fifth largest economy in the world, it is hard to conceive that just because we are no longer in the EU we won't be capable of arranging competitive deals with non EU countries. However, the argument stands that European countries, whether happy to invest in the UK infrastructure or not, may impose higher energy prices to the UK. It all depends on the outcome of some very complex wider negotiations to come.

Verdict: It depends on the outcome of a negotiation with too many moving parts to call it at this stage.

Continued funding for energy infrastructure

Lower prices 3–3 Price hikes

It goes without saying that the UK has always gone further when it comes to tackling climate change than has often been required. It has often been the first to commit to climate change action and has led the way to make commitments legally binding.

Much of the EU funding for energy infrastructure we may lose as a result of Brexit may be offset by direct membership savings. But the reality is that we have already made 20-year commitments to our energy infrastructure and this is unlikely to be reversed.

Any UK government taking over in the turmoil could, of course, unhinge some of the investment but with a growing emphasis being placed on self-sufficiency (as we will look to move off the 'euro-grid') it would seem further investment may be required and not less.

Verdict: As we cut ties with our neighbours, governments would have to invest in anything that makes the UK more self-sufficient, potentially lowering prices.

Scottish independence

Lower prices 3–4 Price hikes

With import costs up and the possibility of trade sanctions, the attraction to utilise UK energy resources goes up. With our major stock in

North Sea oil, Scottish independence would throw a spanner in the works. A revised UK, without our Scottish neighbours, could mean higher prices in the UK. That said, the decision on Scotland requires more political support before it will play into trading speculation.

Verdict: While the Brexit verdict certainly opens the door to another referendum on Scottish independence, there is too much yet to play out to factor this into pricing just yet.

How are energy prices trading?

For the average energy bill, around 50% of it can be accounted for by wholesale energy costs and the other 50% from the costs of delivery and carbon taxation. Let's examine each of these cost factors separately.

Wholesale/commodity energy costs

Wholesale energy costs have only really reacted to a weakening pound thus far. Other deeper impacts from Brexit are yet to be seen, and as the dust settles we'd expect to see the market stabilise.

The underlying economics are for bearish movements in energy prices whilst supply is comfortable, and worldwide economic data has suggested slower growth in the largest of our world economies.

The current expectation is for an unsettled few months whilst traders show uncertainty to the multiple factors in play, and knee-jerk trading takes place.

Verdict: We would edge on the side of the market stabilising but prices reducing slightly as global demand slows down.

Non-wholesale energy costs

This is where energy costs can be both in and out of a business's direct control. To pay for the infrastructure changes the UK has committed to carbon taxation, which is set to increase by 250% from current levels by 2020.

Such an increase will push up the bill by 30% by 2019/2020 from current levels. This is out of any business's control and, all other factors aside, represents the single largest guarantee of a larger energy bill in 2020.

Even with the lowest historic wholesale prices we've seen this year some businesses have struggled to get into savings territory due to the rise in non-wholesale energy costs.

The situation is only within your control if you can take measures to reduce your energy consumption. And returns on investment are certainly inflated further out.

So when it comes to Brexit and the impact on the energy bill, perhaps we can take a leaf out of the Leave voting book and look to start our journey off the grid. Battery storage is rapidly developing as a technology for storage, renewables are becoming progressively cheaper, and community energy suppliers are gaining support.

From a trading point of view, there's no clear direction of travel from Brexit and liquidity will be an issue. If you have to arrange a supply contract in the interim, short-term contracts make sense. In the longer term don't forget to consider the impact of rising carbon costs already embedded into UK charging methodology. Brexit is not to blame.

The two sides of solar

Bob Mills, Senior Manager at LG Solar, considers the prospect of BiFacial technology at a time of change

The solar industry is undergoing a significant period of change. The Brexit vote is suspected to have serious consequences for the UK's renewable energy sector – changing everything from national renewables targets to the import of solar modules. Similarly, earlier this year, the Government's subsidy cuts directly impacted the industry's record-breaking growth. The Solar Trade Association (STA) is still collecting statistics on job losses, and most solar companies are evaluating their business models to understand what's next.

However, it's not all doom and gloom. Recently Solar Power Europe has published its Global Market Outlook, which showed the EU solar market grew by 15% from 2015 to 2016. As an industry we've also achieved some record-breaking firsts in the last few months. For example, for the first time, the sun provided more UK electricity (via photovoltaic panels) than coal-fired plants over a full 24-hour period on 9th April. This was equal to just under 30GW – or 4% of national demand – being met by solar.

Continuing to drive solar and renewables initiatives across the commercial and private sectors is a no-brainer. It's taking place at an amazing rate around the world, particularly in developing countries like India and Argentina. But manufacturers still have a huge responsibility to increase the uptake of solar through cost effective, efficient design, and most importantly, continued innovation, even under the current intense financial strains.

So where is the next innovation? It's behind you. No really. Able to deliver robustness and efficiency, whilst keeping cost consistent and increasing performance, it's BiFacial technology. BiFacial technology uniquely utilises both sides of the panel to absorb more light and ultimately generate more electricity. Yes, it's a double-sided solar panel that maximises the sun's energy.

When looking at panel design, the majority of solar panels are flat, with photovoltaic cells on one side. Which makes sense for rooftops installations and the like. But does it? Research has found that by raising the panel we can make use of our reflective surfaces for better energy yields. And you'd be surprised at what counts as a reflective surface; grass, tiles, paint, snow, even sand can bounce sunlight back to the module for increased efficiency. The design utilises the whole panel, back and front to get the most out of conditions.

Over the last few years, demands on the solar market have never been higher. Installers are expecting the same level of output, whilst grants are taken away and budgets are subsequently slashed. The only way a true solar and renewable revolution can be delivered is through constant progression and innovation. However, as manufacturers continue to innovate with new ideas, they cannot forget about the value of durability and consistent performance. The industry, and in particular the manufacturers, have a responsibility to tap into every single opportunity, for the huge potential of solar to be fulfilled.

CURRENT AFFAIRS

Bill Wright, Head of Energy Solutions at the ECA, sees hope on the horizon in the form of energy storage

Things may be looking up for the renewable energy industry. Despite the decline in policy incentives and initiatives over the last year, the prospect of low-priced energy storage is sure to be attractive to businesses and the public.

This approach appeals because it allows power to be stored when it is available (and cheap) and used when it's not – both in the domestic sector and grid scale storage. The latter of the two is already under trial, and the domestic approach will likely become more economic if the plans to install smart meters across the UK come to fruition.

Where energy storage really delivers benefits to the end user is through giving them the ability to negotiate tariffs, which makes storage both economic and profitable. The big question, however, is whether or not the suppliers want to do this, and some pressure from the regulatory authorities may be required to ensure tariff variability and proper competition in the market.

Will this be necessary? I suspect so. These suppliers will already have recognised that large groups of domestic renewable energy providers (the rather aptly named 'prosumers') may wish to come together to take advantage of the financial balancing mechanism that is available. As a result, these firms may need to be reminded of their duty to operate within the new framework and engage with the needs of prosumers.

As momentum grows there may well be increased interest from some prosumers in operating separately from the grid – particularly as technology evolves, and renewable or storage installations are able to facilitate this. When this happens it will pose yet another challenge for the suppliers and distributors about how to manage multiple, low power loads and generators – and they'll need to be innovative to keep pace with the changing needs of businesses and households.

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UK to fall short on EU 2020 renewable energy targets

DECC confidence in achieving legally binding targets is failing to deliver, new analysis from the National Grid warns.

The report reveals that the UK is almost certain to miss its European 2020 renewable energy targets, and recommends a massive growth in green electricity, heat and transport.

It also highlights the massive growth required in renewables if the nation is to meet our long-term climate change targets.

Dr Jenifer Baxter, Head of Energy and Environment at the Institution of Mechanical Engineers, said in response to the National Grid report, which says the UK is almost certain to miss its EU 2020 targets for renewable energy: "This confirms that the recent cut in renewable energy subsidies, as well as the lack of clear policy to encourage low carbon technologies, has led to a drop in investment in renewable energy.

"Previous subsidies generated many new renewables projects, many of which are still coming online. These projects have led to an over generation of electricity on the grid at the wrong times, when demand is low, and this has yet to be balanced in an efficient or affordable way.

"New technologies that influence electricity generation and grid management are rapidly developing and it is vital that both the Government and National Grid plan for the consequences of these new technologies. As a country we do not want to pay for the delivery of stranded assets whether renewable or non-renewable.

"While this renewable target is a good driver to encourage investment, the key issue is for the UK to meet its ambitious carbon reduction target, which cannot be done by relying on current renewable technologies alone.

"The UK needs to look to switch to generating electricity from low-carbon fossil fuels such as gas and nuclear power and invest into research and development of the next generation of low carbon technologies and improved technologies around transport and heat as well as the management of radioactive wastes. Greater investment in the development of electricity storage technologies in particular could be key to allowing a greater proportion of electricity to be generated from renewable sources.

"The UK Government needs to urgently clarify the country's energy policies and regulations to provide developers with the certainty needed to invest in particular technologies, such as electricity storage."

Niall Stuart, Chief Executive of Scottish Renewables, said: "This is just the latest piece of research which shows the UK is set to miss its 2020 renewable energy targets.

"We have simply failed to grow renewables' share of the energy used in heat and transport to the levels required, and we will not meet our climate change targets without massive changes in these two areas.

"The irony is that there are a huge number of renewable power projects which could provide cheap and clean electricity before 2020 and make up the shortfall from heat and transport.

"However, onshore wind and solar – the two cheapest forms of clean electricity generation – are unable to bid for long term contracts for power, and other technologies cannot access support until 2021 at the earliest."

National Grid's report also highlights the massive growth required in renewables if we are to meet our long-term climate change targets.

Stuart added: "According to the report, we need to triple the UK's capacity of renewable electricity generation if we are meet our 2050 climate change targets in the most competitive way possible. There is no way we will deliver that without clear and coherent short, medium and long-term objectives for the energy sector – and policies to achieve these."

Renewable industry leaders react to 'leave' vote

In his opening remarks to the Scottish Renewables' Onshore Wind Conference in Glasgow last month, the organisation's Chief Executive Niall Stuart said: "The many questions thrown up by Brexit just add to the huge uncertainty that was already surrounding Scotland's renewable energy sector following numerous changes to support by the Westminster Government over the last 12 months.

"We know that implementing the vote to leave the EU will be a huge and complex task. But if we want to keep investing in renewables, to protect the jobs that the sector supports and to continue cleaning up the energy sector, then the UK Government must ensure it doesn't get in the way of three crucial things for the industry.

"Firstly, that ministers stick to their plan to announce this summer the final decision on support for renewable energy projects on Scotland's islands, and the details of auctions for offshore wind, wave and tidal energy.

"Secondly, that common sense prevails on onshore wind and solar, and that the two cheapest forms of clean electricity are again allowed to bid for long-term contracts for power. That makes sense for industry, for consumers and for the environment.

"And, finally, it is vitally important that our new Prime Minister and Cabinet set out a clear and unequivocal commitment to the country's international obligations to tackle climate change. We are confident that significant growth in renewables will be key to achieving that, and to keeping future bills down for consumers."

Dr Nina Skorupska of the Renewable Energy Assocication commented: "This result raises serious questions for investor certainty, energy security and much needed investment in the UK energy infrastructure.

"Energy policy must be a priority for the Government now, with industry needing reassurance and ministerial clarity on priorities. The first in this list must be confirmation of the fifth carbon budget, which will hopefully give some confidence in the long-term direction of UK energy policy.

"The vast majority of our members had fears of Brexit, and we will be consulting with them and government in the coming weeks to set out a plan for continued low carbon energy investment, deployment and assurance of the 117,000 jobs in this sector."

Tony Ward, EY's Head of Power & Utilities, commented: "Being an island with limited interconnection to the continent, the UK has out of necessity had to meet its energy needs, from electricity generation through to water distribution, largely from its own UK-based resources and assets. Demand for these services is not likely to change materially, despite the vote to leave the EU, and the UK-based industry will continue to meet that demand.

"However, the UK has become increasingly dependent on the import of fuel and technology to construct and operate assets. If, as expected, sterling declines in the FX markets, the price of these imported resources may rise, increasing the costs to end users of energy in particular.

"The vote to leave the EU will also likely make its impact felt by creating an immediate heightened level of policy and regulatory uncertainty. Whatever Government emerges in the aftermath of the leave vote it will need to clarify its policies with respect to climate change, renewable energy, technology preferences, state aid and many other matters of direct relevance to the utility industry, and to its investors.

"In many respects, the UK has taken a lead in Europe when it comes to renewable and low carbon policies – the question as to whether support for low carbon technologies will be withdrawn, and whether other industries will be favoured, is a fundamental one. How UK governments from now use their freedom from EU policy constraints will be watched closely."

"We believe that the EU has been good for energy efficiency, but it is obvious that issues of the economy and immigration had a greater impact on the outcome," explained Martyn Reed, Managing Director for Elmhurst Energy. "We urge MPs not to 'throw the baby out with the bath water' and instead give careful consideration to the benefits that have been gained from the Energy Performance of Buildings Regulations before making any changes."

Energy rating is not an invention of Europe. This system has been used to assess UK building stock for many years, and will continue with or without Europe. The Standard Assessment Procedure (SAP), the reduced version (RdSAP) and Simplified Building Energy Model (SBEM) were invented in the UK for UK buildings and climate conditions.

Reed continued: "The Government will still need policies and tools to enable the UK to use less energy and save people money. Consumers now expect information on everything they buy and buildings are no different. That demand will remain."

Round-up of all the latest green gadgets and innovation to hit the market

ProductNews

LG

Therma V

LG has received MCS approval for its Therma V High Temperature heat pump. This makes the unit available for the Renewable Heat Incentive scheme – RHI – with immediate effect.

This latest model of the popular Therma V range of air to water heat pumps from LG can deliver hot water at up to 80 degrees C for cascade dual refridgerant cycles of R410a and R134a and up to 65 degrees C for single refrigerant high temperature systems.

The new high temperature version of the unit is ideal for projects where replacement of an older heating system with an air source heat pump is required and other energy efficiency measures are not possible or feasible. The LG High Temperature unit is ideal for combining with hot water cylinders or thermal stores and has already been successfully linked with other renewable technologies including solar PV.

A new installation should see the current tariff of 7.51p per kWh of renewable heat generated paid by the Renewable Heat Incentive Scheme, paid quarterly for seven years from the date of installation.

LG Chem

RESU10H/7H batteries

SolarEdge, a global leader in PV inverters, power optimisers, and module-level monitoring services, and LG Chem, one of the world's largest chemical companies, have announced the compatibility of SolarEdge's StorEdge solutions and LG Chem's new high voltage RESU10H and RESU7H batteries. This compatibility will help to further advance accessibility to cost-effective residential solar generation, storage and consumption.

With both on-grid and backup solutions, the new offering supports increasing self-consumption, providing power backup, and enabling energy independence. LG Chem's RESU batteries use Li-ion technology, and their compact size allows for easy and flexible installation, both inside and outside. The RESU batteries have a high energy density and are designed for high efficiencies and a long lifetime.

Designed to manage both functions with just one SolarEdge DC optimised inverter, the combined solution will include remote monitoring and troubleshooting to keep operations and maintenance costs low. The StorEdge solution will support both DC and AC coupling. As with SolarEdge photovoltaic systems, StorEdge offers enhanced safety by reducing voltage to a safe level upon AC shut down when not in backup mode. The upgrading of existing SolarEdge systems is supported.

Big Wipes

Multi-purpose bucket

Big Wipes has introduced a handy new and reusable bucket, containing 300 industrial-strength multi-purpose wipes to help installers ensure that they'll never encounter a clean-up job that's too big to handle!

Big Wipes 4x4 easily shift all modern construction sealants, adhesives, paints, coatings and grime in an instant. Containing four powerful cleaning agents and four dermatologically tested skin conditioners, they are truly tough on grime but at the same time kind to your hands.

Big Wipes 4x4 Multi-Purpose wipes are made from a three-layered, non-woven quilted fabric, exclusive to Big Wipes. This highly absorbent fabric captures liquid between the fibres, minimising the number of cleansing wipes the user has to go through for any cleaning job and thus making them a more efficient, economical option. The bucket design also allows for easy access to the required number of wipes, further cutting waste.

The innovative Power Fabric Technology also results in the wipes being extremely tear resistant, lint-free and super tough – making light work of cleaning up your hands, surfaces and tools after a mucky day out on site.

Worcester, Bosch Group

Wave

Worcester, Bosch Group, has added new functionality to its Wave smart internet-connected controller, offering installers more reason to integrate sophisticated heating and hot water controls into homes nationwide.

The new self-learning technology in the device will now take user habits into account and act accordingly for even greater comfort and efficiency. The update will be accessible through its free and easy-to-use App and makes the Wave one of the first heating controls to be compatible with smart watches.

Worcester is also making life easier for installers with a scannable QR code, allowing them to register the control automatically.

Beamreach Solar

Sprint

Beamreach Solar, formerly Solexel, has announced the introduction of Sprint, its new lightweight PV solar panel system for flat commercial roofs. Sprint's light weight allows it to be installed on nearly all commercial roofs that cannot currently support heavy conventional systems, dramatically expanding the commercial solar market.

In addition to offering a lighter weight panel, Beamreach Solar's Sprint also has potential to provide customers with a better return on investment and a lower cost of electricity, with more power, an ultra-fast install process, more panels on the roof, easy removal and reinstallation and lower shipping costs.

Solar Technology International

SolarHub

Out of home lighting is one area Solar Technology International has focused on, leading among other innovations to the development of a new and straightforward lighting solution – the SolarHub 16.

The unit provides mains-quality lighting from strip LEDs to illuminate an area of up to 16m². In addition to light, the SolarHub also provides power to charge phones and other devices, it can be quickly and simply installed to virtually any building whether a stable, shed, agri building, warehouse or garage.

The design incorporates a high-efficiency all-weather solar cell to maximise charging to its lithium battery, even on cloudy days, providing up to six hours of light daily. The Solarhub 64 has the capacity to light an even larger space of 64m² and both SolarHub models are expandable.

What does Brexit mean for community energy?

Following the landmark Brexit vote in June, **Pure Leapfrog** considers what the result might mean for renewables, and community energy in particular

There could be some benefit from a reduction of EU legislation that affects community energy but the sector is inextricably linked to the performance of the UK economy, legal and political systems. As such the direction for community energy in the short term could be driven by the overall appetite for investment in energy infrastructure at a national level. The little we've heard in the short space of time since the result is that commercial organisations are likely to take a watch-and-wait approach. Long-term implications will be dependent on a variety of factors including whether there is a change in priorities for energy and climate change policy under new Conservative leadership, what Scotland chooses to do, and how much EU regulation is retained as UK law.

A UK-EU relationship

It is unclear at this early stage what form of relationship the UK can expect with the EU in the future. There are several possibilities, the first being that the UK enters into the European Economic Area (EEA – Iceland, Lichtenstein and Norway) or European Free Trade Association (EFTA – the EEA plus Switzerland). There are differences between the two models but essentially both require compliance with the vast majority of EU legislation, including energy and competition legislation that concerns community energy.

If this is the option the UK ultimately goes for, little will change for community energy. The UK will not have a say in making that EU legislation, but this does not mark a huge change as the current administration has yet to campaign for specific community energy support within the EU.

Going it alone

The other option would be that the UK fully removes itself from the EU single market. This would mean the UK could decide what EU legislation to keep. Whilst there are risks that any new government could water down existing legislation, there could be potential benefits for community energy. Admittedly these might take years to come to fruition. Firstly, state aid legislation (rules about how much government can subsidise a particular sector) would not apply, which may reduce the cost of some capital. Secondly, associated EU rules, such as those surrounding public body tenders, would disappear, simplifying matters. Finally, and potentially most importantly for community energy, the UK could prioritise getting favourable trade deals for the renewable sector – eg. the current import tariffs on solar panels from China could be cut, lowering the capital costs of a project. However, this would require intense trade negotiations.

The vast majority of the UK's environmental legislation is derived from European legislation (this is mainly a function of timing; the UK joined the EU in 1973 and it was in the 80s and 90s that environmental legislation proliferated across the Western world). The UK has generally taken a pro-environmental stance in EU legislative negotiations and there are even some areas where the UK has enacted legislation even more environmentally favourable than the EU equivalent. Certainly until the UK's formal exit from the EU is triggered, there won't be a bonfire of environmental legislation. But future UK governments could no longer be restricted by EU rules, enabling an easier dismantling of environmental protections at will. And the UK government could have done a lot more to date to minimise the effect of state aid rules on community energy but declined to do so. Therefore whether a UK government unconstrained by EU rules would produce legislation that is better for the community energy sector than that which currently exists is by no means clear. This current government certainly has been no champion of the sector and initial assessment of the climate change views of senior 'leave' Conservative politicians indicates the future environmental legislation may favour renewables even less so. This will require the sector to lobby government to ensure the prominence of local and community energy at a political and civil servant level.

The uncertainty paradox

The immediate prospects for community energy following the vote are difficult to predict. The UK economy has seen some economic turmoil in the immediate wake of the result and the more immediate effect will be how much investment in community energy will take political risk into account. Further, any projects which had EU funding sitting behind them are now in question.

As the details of the new UK-EU relationship become apparent, the community energy sector may be able to make some gains depending on how much EU regulation the UK retains in the future. Also, if there is underinvestment in energy in the UK due to political uncertainty (what will happen to the Chinese and French backed Hinkley Point C nuclear plant, for example?), with community energy's ability to innovate and access alternative forms of finance, there may be opportunities that aren't afforded in the traditional energy market. A probable outcome with this uncertainty, for example, is that any rise of inflation and delay in capital spend on infrastructure could push up energy prices. These increases would hurt the fuel poor but conversely push up the price of power purchase agreements, making renewables and energy efficiency projects more economically attractive.

Certainly the case for community energy and the ability to deliver tangible social benefits remains steadfast, and any swing further to the right politically that might happen will likely only make the case for the work more compelling as the state recedes further. In the political and economic commotion, there may well be an opportunity for community energy to capitalise on the uncertainty and confusion and make headway where others are holding back or waiting to see what happens next. What's left of the Feed-in Tariff, for example, is still enshrined in UK law and whilst it provides slim pickings it is an example of one of the many pieces of legislation that are not yet affected.

Our best advice for community groups is to move as quickly as possible on any viable projects. Please get in touch with Pure Leapfrog if you think our templates, funding or consulting services can assist you in getting projects over the line.

Biomass plant to mark another first for Discovery Park

Work has begun on a new £140 million biomass plant, which will eventually produce all the power and heat requirements for leading science and technology park Discovery Park, in Sandwich, Kent.

Global power plant contractors BWSC took possession of the development site last month, marking the start of a project that will take around two years to complete.

It will create 300 jobs during its construction phase and 30 full time jobs once operational. Biomass fuel will be sourced from various wood types, including coppice grown locally in Kent and East Sussex.

Paul Barber, Discovery Park Managing Director, said: "The agreement to press ahead with the new biomass energy plant not only represents a major investment in the site, but puts the park in the unique position of being supplied with a reliable source of green energy.

"The new biomass plant, is a vital part of ensuring the site's ongoing success – part of a number of investments and ongoing work that will not only create jobs and prosperity for East Kent but increases its sustainability too."

£25m Guardbridge Project heats up with arrival of 130-tonne biomass boiler

The £25 million Guardbridge Energy Project in Fife, Scotland, which is central to the University of St Andrews' strategic drive to become the UK's first energy carbon neutral university, moved a step closer to completion recently when the Vital Energi project team took delivery of the 6.5MW biomass boiler furnace. It made the 1,300-mile journey from Swedish manufacturers Jernforsen's own facility in the remote town of Järnforsen.

The biomass boiler and furnace is 10 metres high, will weigh over 130 tonnes when operational, with fuel, and is capable of generating heat above 1000°C. The furnace will be used to generate high temperature flue gases, which pass through the exhaust gas heat exchanger, generating medium temperature hot water (MTHW) within the energy centre.

The MTHW passes through a system of heat exchangers generating the low temperature hot water (LTHW), which will be pumped through a district heating network to the North Haugh campus, where it will deliver heat and hot water for the next 50 years.

When completed, the project will deliver approximately 6,000 tonnes of CO2 reduction per annum. The use of LTHW minimises system losses through the heat network and operational construction costs of the heat network, which is designed to operate at pressures in excess of 16bar.

Regional Director for Vital Energi Mike Cooke commented: "I believe that this is one of the most exciting energy projects in the whole of the UK and the scale of the network, the carbon savings generated and the benefits to the local community make it unique.

"The biomass boiler will be the heart of this energy solution, using up to 17,000 tonnes of locally sourced wood to deliver greener, more affordable heat and hot water to the University's buildings, and the scheme is a great example to other organisations of what can be achieved."

The Guardbridge Energy Scheme is a 75-week project, which sees Vital Energi retrofit a state-of-the-art energy centre into the former paper mill, alongside a 14-mile district heating network that will connect to 37 buildings and plant rooms. The boiler can produce heat in excess of 8MW and will achieve 87% efficiency at full load conditions.

Northern Irish anaerobic digestion plants, including pioneering poultry project, secure £10.5m investment

The Foresight Group LLP managed Recycling and Waste LP (RAW) Fund, in which UK Green Investment Bank plc is a cornerstone investor, has committed £10.5 million to two anaerobic digestion (AD) plants in Northern Ireland.

RAW has invested £8.7 million in a 3MW AD plant near Ballymena with co-investment of £4.4 million from Foresight AD EIS Fund, £8.7 million from Invest Northern Ireland and £1.5 million from Xergi. Xergi has been awarded the engineering, procurement and construction (EPC) and operations and maintenance (O&M) contracts for the project.

The Ballymena project is being developed by Stream BioEnergy Limited, an experienced AD project developer in Ireland and Northern Ireland, and is expected to be one of the first plants in the world to be fuelled solely by poultry litter.

Economy Minister Simon Hamilton said: "This project has been developed as a result of support under the SUPL SBRI Project and the SUPL Loan Scheme. It is an outstanding example of public sector and private investors coming together to support a new technology for sustainable agriculture and to grow our economy.

"In addition to helping the local poultry sector to grow, the plant will create up to 100 jobs during the construction phase with a further 11 new jobs available when the plant becomes operational in 2017."

So what exactly is an HIU?

Heat Interface Units (HIUs) are becoming increasing popular, however they are still relatively new and the concept may not be familiar to everyone. *Mitch Cadd, Managing Director of Mibec Limited, explains what HIUs are and their many benefits to installers, designers, developers and occupiers.*

HIUs (also sometimes known as Thermal Interface Units, Heat Boxes or Consumer Interface Units) basically fulfil the same function as a gas boiler in a property when used as part of a communal heating network. A central plant room (either with a gas boiler or a renewable energy source) will generate heat, which is distributed through a network of pipes to each separate property in the building. Each home or apartment has its own HIU installed, which uses heat distributed from the central network to provide heating and domestic hot water (DHW), completely replacing the requirement for individual boilers in each property. To the end user it's just like having a boiler but without the flame.

The concept is all about improving energy efficiency, reducing CO2 and saving on running costs by having one large heat source operating very efficiently. This lends itself well to projects such as apartments, holiday homes and social housing, which would usually require multiple small boilers.

Occupants will find that all their hot water and heating requirements are easily supplied by HIUs, with models available that provide instant supply on demand. HIUs take up very little space, and maintenance requirements are straightforward compared to a regular boiler with easy access to components inside the box for the service engineer, saving time and money.

HIUs are also a great option for designers and developers, with the biggest advantage being that each individual property doesn't need its own gas supply, hugely simplifying the project and saving on capital costs. Not having a gas supply into a property means that the installers of HIUs don't need to be Gas-safe registered, and there is no requirement for flues, again saving on costs but also providing more flexibility around the design and layout of the property. Having a centralised plant in the building can help developers meet CO2 targets and makes using a large renewable heat source such as biomass a great option for the project. Installers will find HIUs easy to fit and commission, the associated pipework is easy to install and often only a programmable room thermostat is required to complete the system.

In rented accommodation landlords can benefit from reduced service and maintenance costs compared to individual boilers. The removal of gas supplies makes complying with health and safety laws easier, eliminating the need for individual gas compliance checks and also removing any worries about carbon monoxide emissions. HIUs can include individual accurate metering which makes billing for the tenants fairer and makes it easy for the landlord to manage large portfolios of properties. Some units can accommodate pre-payment metering. The tenants will also have good visibility of consumption, promoting energy saving around the home.

Partner organisation
MCS presents its regular
column for REI

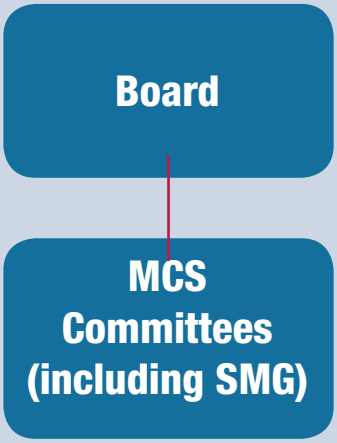
Update on the new MCS structure

Key focus of MCS over the past 18 months has been establishing the MCS Charitable Foundation (MCS CF) and the enduring structure of its legal entity (MCSSCo Ltd).

The role of the MCS CF will be to provide both confidence and trust in renewable and low carbon technologies, whilst ensuring focus remains on consumer and environmental protection.

- In August 2015, six Trustees were appointed to serve on the inaugural board of the MCS CF. For further information on the Trustees please visit: http://www.microgenerationcertification.org/about-us/news-and-events
- Four new Board Director designates have been selected for the MCSSCo Ltd and an additional two MCSSCo Ltd Directors have been appointed from the Board of Trustees of the MCS CF.
- The Charity Commission has approved MCS's application for charitable status. MCS has received a response from Companies House and the charity has been incorporated into the MCSSCo.
- The Novation process is ongoing and following completion the Director Designates will be officially appointed to the MCSSCo.

MCS CF will take full ownership of the MCSSCo Ltd, which will comprise of the following structure until the new Board put in place the future governance arrangements for the Scheme:



The MCSSCo Ltd will operate the certification scheme and the MCS CF will have oversight of the MCSSCo, but focus on utilising the MCS surplus income for the public benefit as laid out in its Articles of Association and Objects.

A new Stakeholder Advisory Group will be established to operate in an advisory capacity to support the MCSSCo Board, and work on this Group's Terms of Reference has already begun. It wad agreed that the MCS Steering Group was to be disbanded back in April 2016.

For updates regarding the status of the MCS CF and MCSSCo, please check the MCS website.

FiTs consultation on micro CHP support launched on 26 May

The Feed-in Tariffs (FiTs) scheme is the Government's subsidy scheme for generation of renewable electricity from small-scale installations. The UK is currently obliged by our EU State Aid notification to consult on the performance of the scheme every three years.

As the core FiTs Review consultation in 2015 did not seek views on whether generation tariffs for anaerobic digestion (AD) or micro-combined heat and power (mCHP) continue to give investors an appropriate rate of return and prevent overcompensation, the Government has launched a 'Review of support for Anaerobic Digestion and micro-Combined Heat and Power under the Feed-in Tariffs scheme' consultation on 26th May 2016.

The key micro-CHP proposals outlined are:

- A deployment cap of 3.6MW to the end of 2018/19
- This is broken into annual caps
- 10% contingent degression of the tariff should an annual cap be met
- The current tariff is not changed

You can read the full consultation at https://www.gov.uk/government/consultations/review-of-support-for-anaerobic-digestion-and-micro-combined-heat-and-power-under-the-feed-in-tariffs-scheme.

If you would like to respond to the consultation you can do so online, by email or post.
Online: https://econsultation.decc.gov.uk/decc-policy/review-of-support-for-anaerobic-digestion-and-micr/consult_view
Email: ADmCHPreview@decc.gsi.gov.uk
Post: FiTs Review Team, Clean Electricity Directorate, Department of Energy & Climate Change, 4th Floor Area D, 3 Whitehall Place, London, SW1A 2AW.

UK's largest distributed heat project goes live

Packaged biomass boiler systems from Armstrong Fluid Technology have been instrumental in delivering the UK's largest ever distributed heat project. A total of 72 bespoke biomass boiler systems were off-site manufactured by the company for installation in Bernard Matthews farm sites across the east of England, thereby

making it possible to deliver this massive biomass project effectively within the necessary timescales.

Bernard Matthews is Britain's largest turkey producer, farming over seven million turkeys each year. Around 40% of the company's farming estate was refitted in this project, involving 179 different biomass heating systems spread over 248 turkey sheds. Lumicity, the company responsible for delivering the project, arranged finance through Equitix and the UK Green Investment Bank, making the upgrade to renewable on-site generation possible at no capital cost to Bernard Matthews.

At planning stage Lumicity decided to adopt an off-site manufacture approach

as this would help to streamline the significant logistical challenges relating to the construction, installation and commissioning of a project of this size. The supply partner chosen for the project was Armstrong Fluid Technology – a specialist in packaged HVAC plant and off-site manufactured integrated plant rooms.

NT property gets green energy makeover

Geberit Mapress Carbon Steel has installed a biomass system at Saltram House, a magnificent National Trust owned stately home in Plymouth.

One of many National Trust premises to get a renewable makeover as part of a general drive to improve the environmental credentials of the organisation's buildings, Saltram now enjoys heating and hot water courtesy of a biomass system consisting of 220kW and 95kW boilers, fuelled by pellets. A district heating system services the main house and the majority of other buildings on the site.

"We use Geberit Mapress on 95% of our jobs," said James Howard, from Dunster Biomass, which installed the system at Saltram House. "It's quick to install, easy to use and reliable. The fact there's no need for hot works makes it ideal for historic buildings.

"At Saltram House, the new biomass system had to be installed within the confines of the existing building and its heating system, while ensuring that it could be easily removed if required. Faced with narrow doorways and cramped spaces, Geberit Mapress was the ideal solution.

He added: "The age of the building and cramped environment also meant that solder was just not an option because of the fire risk. Geberit Mapress and its press fit assembly is particularly well-suited to jobs of this nature."

Celtic Manor Resort chooses CHP system

EuroSite Power, an on-site utility solutions provider, offering clean electricity, heat, hot water and cooling solutions to healthcare, hospitality, housing and leisure centres in the United Kingdom and Europe, has signed an On-Site Utility agreement worth approximately £4.11 million with The Celtic Manor Resort in Newport, South Wales.

Home of the 2010 Ryder Cup and host venue of the NATO Summit 2014, the five-star Celtic Manor Resort is set in more than 2,000 acres of panoramic parkland at the gateway to Wales. With three hotels – a 334-room luxury Resort Hotel, a historic 19th century Manor House with 67 rooms, and an additional 148-bedroom hotel, Coldra Court – two exceptional spas, two state-of-the-art health clubs, fishing, adventure golf, treetop high ropes course, tennis courts, mountain biking and walking trails, The Celtic Manor Resort provides a complete experience for business, leisure and golf travellers.

Under the terms of the 15-year On-Site Utility agreement, EuroSite Power will install a highly efficient combined heat and power (CHP) system at The Celtic Manor Resort. EuroSite Power will retain ownership of the equipment installed and cover all maintenance costs. Avoiding any capital outlay, the resort will simply buy the energy produced by the system from EuroSite Power at a rate guaranteed to be lower than if it were to source the same energy directly from the grid.

The 400kW TEDOM CHP system will produce up to 2,174,960kW of electricity and 2,579,990kW of heat per annum, while saving up to 751 tonnes of carbon dioxide (CO_2) – equivalent to taking 159 cars off the road – each year.

The new contract brings EuroSite Power's contracted portfolio of systems to 38 with a total lifetime contract value to the company of £70.33 million from units totaling 4,498kW electrical capacity.

Sky-high solar for South Bank Tower

London's newly redeveloped South Bank Tower will harness the power of the sun to light up its 193 luxury apartments, shops, restaurants and bars after a solar array was installed on the roof.

The 1970s skyscraper, formerly known as King's Reach Tower, has been transformed into luxury apartments after being derelict for almost 10 years, alongside 370,000ft² of office space and 72,000ft² retail space – complete with a 100-panel, 26kWp PV system on top. Another 11 floors were added to the building during the process, taking it up to 42 storeys and 155 metres in total.

The system, developed and fitted by Nottinghamshire-based EvoEnergy, comprises 50 Solarworld 260 panels on the 41st floor and 50 on the 42nd, making it one of the highest solar installations in the UK. It is expected to generate 22,400kWh per annum, saving the tower around 11,850kg of CO2.

South Bank Tower is nestled between two iconic bridges over the Thames, Blackfriars and Waterloo, and forms part of the ongoing regeneration of the South Bank. It has been developed by CIT, a London-based private and independent real estate investor and developer, and Jadwa, an investment bank based in Saudi Arabia.

Omni launches Biolectric slurry-only biogas plant

Renewable heat and energy specialists Omni Heat and Power has pledged to create 50 new jobs over the next five years – after winning a major contract with a Belgian company.

The firm, based at the Nova Centre at Keele University, has entered a dealership agreement with Biolectric to distribute and install a revolutionary new product aimed at farmers.

The new anaerobic digestion (AD) plant sees slurry from cows transformed into heat and energy – enough to power the whole of the farm.

And Government funding has been secured as part of the arrangement, meaning that the company can offer free installation on suitable sites.

Dulas mints Welsh solar scheme

Dulas, a leading renewable energy developer, has recently completed the installation of a 15kWp rooftop solar project at the new The Royal Mint Experience visitor attraction in Llantrisant, near Cardiff. The project follows the firm's continued growth in the solar PV sector, having installed a total of 7.6MW to date.

As solar-related costs continue to fall, and mainstream electricity prices steadily rise, new-builds are investing in this technology as a source of readily available clean energy as well as an opportunity to unlock multiple alternative streams of revenue. Dulas has created a series of successful partnerships with building and electrical contractors, leading to a promising pipeline of solar projects for the new-build sector.

Subcontracted to local Welsh firm CMB Electrical Contractors, Dulas delivered The Royal Mint project in a week, installing all 46 panels on the flat roof of the building.

With the installation in place, The Royal Mint Experience will be able to meet significant energy commitments, as well as accessing additional revenue streams. It is anticipated that the solar panels installed on the roof of the visitor attraction will generate more than 8,000kWh a year, helping the institution realise significant energy cost savings.

GSHP

What: Heat pump upgrade for flagship housing estate

How: Kensa ground source heat pumps replace electric panel convector heaters

Result: Energy bills reduced with communal heat pump network

Record ground source heat networks completed in just nine weeks

During nine weeks in the Spring of 2016 Kensa Heat Pumps completed a compact and challenging heating upgrade programme featuring 11 of the Flagship Group's properties on an estate in Fressingfield built in 2010. The project showcases the largest number of combinations of communal ground source heat networks installed on one site to date.

The need for a new heating system became apparent when residents of the five-year-old houses were stung with high energy bills from their inefficient electric panel convector heaters, with one customer reporting bills of £500 a month. Energy for this system could only come from one provider, making switching to reduce bills impossible. "When I moved into the house, I couldn't believe we had electric panel heaters. I knew these wouldn't be good for our carbon footprint. So to have a new ground source heat pump is fantastic. It is a major improvement," commented Mr Blowers, one of the 11 recipients of a new Kensa heat pump.

The housing provider gained unanimous support for its plans at a consultation meeting with residents in January, who all voted for the Kensa Ground Source Heat Pump (GSHP) system.

ASHP

What: Eco 'superhome' goes for green energy

How: Solar PV supported by 6kW Dimplex air source heat pump

Result: Subsidy cash alongside 80% reduction in energy bills

Driving down bills at award-winning 'low cost' eco home

A Dimplex air source heat pump forms part of the award-winning energy credentials at a 'superhome' designed to showcase the energy savings that can be made using grants and relatively low-cost improvements.

Nigel and Christine Humphrey, from Penarth in the Vale of Glamorgan, wanted to cut the cost of running their detached 1940s home without spending the sums required to reach Passive House standard. Instead Nigel, who runs his own architecture firm, MAS Architecture, focused on heat loss, infiltration and controls, using all the grants available to install an efficient – and cost-effective – heating and distribution system in the home.

Taking a whole house approach, the Humphreys installed cavity wall insulation, floor insulation, loft insulation and triple glazing, together with low energy appliances and lighting to help minimise energy bills. They also opted for the renewable energy in the form of solar PV panels and a Dimplex LA 6 MI 6kW air source heat pump. Operating at a Coefficient of Performance (CoP) of 4.4 (air 7°C, water 35°C), the heat pump feeds a system of underfloor heating panels, which have been laid vertically within the interior walls to prevent the need to take up the original flooring in the original house, as well as in the conventional way under flooring in a new extension.

The result is at least an 80% saving on energy bills, together with annual payments of around £250 from the Feed-in Tariff for the solar PV and over £1,000 each year for seven years through the Renewable Heat Incentive for the Dimplex Air Source Heat Pump. Thermal modelling for the property predicted an annual energy bill of £500, which has since been achieved in the first year.

GSHP

What: Sustainable energy upgrade for barn conversion

How: Go Geothermal supplies GSHP supported by solar thermal

Result: Low flow, energy efficient radiators heat historic home

Heat pump technology for sustainable barn conversion

Minstrels Barn in Caldwell, North Yorkshire, is a traditional barn that underwent a major refurbishment to convert it into a comfortable living environment. Far from a simple project, the homeowners were set upon implementing renewable technologies that would make the building sustainable for years to come.

Sean Sowden, the property owner and co-founder of Go Geothermal Ltd, specialists in renewable heating technologies such as heat pumps, outlined how this ambition translated to the heating of the property: "Minstrel's Barn was previously fuelled through oil, which is extremely expensive and inefficient in large indoor spaces such as the barn," he said. "We decided to install a ground source heat pump as an alternative, supported by the use of solar thermal energy (to heat domestic hot water and to pre-heat the Glycol up to 20°C), and set ourselves the target of achieving the most efficient closed loop ground source heat pump in the UK – with a Coefficient of Performance (CoP) ratio of at least 6.5.

"However, given the heritage of the building, we had to ensure that we retained its character. As such, we needed a heating solution that could work effectively with a heat pump whilst accommodating the building's defining features. For example, keeping the original oak floor in some rooms, as well as decorative floor tiling in others, meant that underfloor heating wasn't an option. Low flow, energy efficient radiators became the natural choice."

In order to meet these objectives whilst ensuring the property was sufficiently warm, Mr Sowden specified 18 Low-H2O Jaga Strada DBE radiators to be installed throughout the home. These, along with the heat pump itself, were installed by Trimark Future Energy Systems.

GSHP

What: Farmhouse upgrades heating and hot water system

How: Finn Geotherm

Result: Reduced energy costs and money-back from the RHI and ROCs

GSHP warms 19th Century farmhouse

The owners of a picturesque 1800s farmhouse in rural South Norfolk are enjoying a warm home and reduced energy bills, thanks to a ground source heat pump installed by renewable heating experts Finn Geotherm.

While renovating redundant farm buildings on their land to create a new home for themselves, Michael and Judy Watson decided to upgrade the heating and hot water system in the farmhouse where they currently live. The house, originally two separate homes joined into one, will be passed to the Watsons' family in a few years, once the renovation is finished.

Finn Geotherm specified and installed a Lämpöässä Emi 43 ground source heat pump and 1000 litre Superheat thermal cylinder with uprated 60 litre/minute coils. While a beautiful lake within the grounds could have been used for the 2200m ground loop, Finn Geotherm decided that the trenching would cause too much disruption to Judy and Michael's award-winning garden. Instead, the rapeseed field next to the Watsons' house was chosen for the ground loop installation as the most practical option.

Pump up the performance with specialist cylinder selection

Jason Hobson, Managing Director of Gledhill, the cylinder specialist, explains why correct cylinder specification plays such a critical role in the performance of heat pump installations

As environmental awareness and energy costs continue to drive uptake of renewable technologies, the potential for installers has been given a further boost by changes to the domestic RHI (Renewable Heat Incentive), which make it easier for homeowners to apply for the scheme.

As of 24th March this year, new RHI applications for domestic properties no longer need a GDA (Green Deal Assessment) to qualify for the scheme. Former stipulations relating to occupancy periods for self-build homes have also been amended to make eligible self-builds exempt from the mandatory 183 days' occupancy requirement for the 12 months prior to RHI application.

It's all good news for heat pump installers, as the popularity of the technology continues to grow and ground source heat pumps remain amongst the highest Feed-in Tariff returns.

Building on this popularity by demonstrating the potential of heat pump technology with best practice installations that maximise performance is still vital, however. Installations must be designed appropriately and in a configuration that meets the specific requirements of individual properties to maximise the SPFs (Seasonal Performance Factors) that determine their efficiency.

Cylinder selection plays a critical role in this by developing the efficiency and SPF rating of heat pump installations, which is why it's so crucial to understand the range of options available.

Hot water only

Where the energy from the heat pump installation is intended for the domestic hot water system only, an unvented cylinder is the ideal solution.

A cylinder specifically designed for use with heat pumps should be chosen to maximise performance, energy efficiency and safety.

Gledhill's StainlessLite HP has been designed specifically for use with heat pump applications, providing low pressure drop and high flow rates thanks to a multi-pass coil heat exchanger manufactured from corrugated stainless steel tube. Incorporating up to four square metres of coil in the largest units, the innovative coil design maximises heat exchange to optimise the lower temperatures associated with heat pump technology.

Unvented cylinder specification for heat pump installations must also consider legionella risk, ensuring the temperature of the stored water regularly reaches 60˚C in order to pasteurise the cylinder. An immersion heater with a thermostat set to bring the immersion heater on at a temperature just below the heat pump maximum and switch it off at between 60-65˚C will address this requirement. This maximises the direct energy extracted by the heat pump, enhancing its efficiency while ensuring it is safe to use at the tap, in line with guidance from the Hot Water Association (HWA).

It is also worth considering that unvented cylinders can utilise solar thermal to generate the property's hot water, in addition to the input from the heat pump.

Heating & hot water

Where the energy from the heat pump is required for use in both the heating and hot water systems, a thermal store is required.

Thermal stores also provide the ideal solution for installations where heat pump energy is being used in combination with other heat sources, providing a straightforward installation and low maintenance option with no discharge pipework, no G3 qualification and no annual service or safety check requirement.

Once again it's vital to choose a thermal store range that has been designed specifically for heat pump installations, such as Gledhill's Torrent Eco HP or HP SOL. As well as the heat pump input, either model can also be supplied with optional solid fuel connections for use with biomass energy sources. Additionally, the HP SOL has a dedicated internal coil for solar thermal input. This will futureproof the installation and, because the thermal store is open vented, it is inherently safe for uncontrolled heat sources.

To enhance safety and performance, a configuration that includes a 3kW immersion heater is a best practice approach, ensuring the availability of boost and emergency back-up.

The energy generated by the heat pump is fed directly into the store for use when needed, providing a safe and efficient means of capturing the heat and energy generated from the heat pumps (along with any complementary energy sources installed in the property). The thermal store then acts as a buffer, allowing the heat pump to run longer without cycling, enhancing both the financial and carbon reduction benefits.

Optimum installation

Over the past few years, the Renewable Heat Incentive has played an important role in driving uptake of all renewable energy technologies in the domestic installations market, and the growth in heat pumps has been particularly marked.

Ensuring that installations deliver maximum performance and efficiency will also play a critical role in supporting ongoing adoption of heat pump technology in the residential market, however, and correct cylinder specification is integral to achieving that goal.

Windhager invests in the future of biomass heating

Windhager's PuroWIN boiler is aiming to set new standards in heating with wood chip with an innovative gasification process

As well as offering uniquely clean combustion, the PuroWIN is packed with fresh ideas and technology, such as being the first system that can transport wood chip using a suction system.

The boiler, now on the market in the UK, is available in five performance levels from 24kW to 60kW.

Oli Duckworth, UK Windhager Director, explained that the company's research and development team started work back in 2009 to develop the PuroWIN and around 60% of their focus was spent tackling the sticking issues that traditionally made wood chip as a fuel difficult to transport and handle.

He said the installers' reaction at a launch seminar was extremely positive, and added: "The whole room was really enthused by the work that has gone into developing this technology – it was really pleasing to see… no doom and gloom.

"This model really does set a benchmark for the biomass sector, there are so many USPs that resolve a lot of issues that have previously been problematic.

"We've closed the book and reopened it with ultra-low emissions, low-energy usage, lower maintenance needs alongside hyper reliability.

"This really does have the potential to be a game changer."

Salzburg-based Windhager boasts that the latest addition to its biomass range will make wood chip heating uniquely eco-friendly, safe and efficient.

The array of technical features includes:

First solution to reduce dust to less than 1mg

Thanks to zero-emission technology, the PuroWIN burns wood chip with almost no emissions. Windhager joined forces with the renowned research institute BIOS in Graz to develop a completely new type of wood chip burner based on updraft gasification. After ignition of the wood chip, an ember bed forms in the bottom of the combustion chamber. Above this, the wood chip carbonises to form a kind of active carbon layer. The wood gases rising from the ember bed are filtered by the carbon layer and the fresh wood chip above it before being burned. This makes the combustion process so clean that the PuroWIN emission levels are more than 10 times lower than the strictest legal emission levels.

Embers retained automatically

The boiler is designed to be completely sealed, so the ember bed can be maintained for up to four days without the addition of fuel or air. During this time the boiler automatically reheats itself, cutting ignition energy by up to 90%. There is also a new ash removal system. Unlike conventional wood chip boilers, the PuroWIN does not have a grate but two closed ash removal plates. These make sure the ember bed is retained when ash is removed. So the heating process can continue uninterrupted even when the boiler is operating at full capacity.

Robust protected agitator

Smooth fuel transport is essential to the reliable functioning of the wood chip heating system. So to transfer wood chip out of the storage room, Windhager uses the newly developed protected agitator. Instead of being installed directly on the floor as in conventional solutions, the gear unit is supported by a protective surround that directs the weight of the wood chip downwards. This makes the agitator extremely robust and able to easily withstand heavy loads within the fuel store.

Safety auger channel with ABS

Wood chip is transported to the boiler through a safety auger channel with specially designed side slide technology.

Thanks to its unique asymmetrical geometry, over 60% of the wood chip is transported to the side of the auger. This makes the auger less vulnerable to damage from larger chips or foreign bodies. At 6mm thick, the auger spiral is also more robust than conventional designs. In the auger channel there is a spiral running in the opposite direction; this Anti Blocking System (ABS) ensures that oversized pieces of wood chip are always safely transported into the drop shaft below.

Smart rotary feeder

To safely convey wood chip into the boiler, Windhager has developed a smart two-chamber rotary feeder. It has sensors which ensure that only pieces of wood that are too large to be transported are cut up, preventing unnecessary wear. The sensors also ensure precise fuel metering and allow optimum adaptation to different fuel qualities.

Low power consumption

As with all of the motors used on the PuroWINs, the rotary feeder features modulating control. As a result, all drives are exceptionally low-wear, very quiet and, above all, energy-saving. On average, the boiler requires just 120W for the complete fuel transport system. Another USP of the PuroWIN is that it does not require a 3-phase power supply and can operate on a standard single-phase 230 volt power supply.

Flexible wood chip suction system

As well as direct auger transport, the PuroWIN can also be combined with a flexible wood chip suction system. This allows fuel to be transported safely and reliably even around curved sections up to 25 metres long and seven metres high. Because the fuel store and the boiler room no longer need to be located side by side, this opens up the opportunity for wood chip heating to be installed in situations where this was previously not possible.

Figure it out

REI 10 – Share performance of UK's leading green energy companies

	52 week high	52 week low	May price	Current price	
Drax Group (DRX)	451.30	205.60	305.80	350.40	▲
Good Energy Group	255.13	199.00	229.00	215.00	▼
Intelligent Energy	151.50	9.48	12.87	9.48	▼
ITM Power	36.45	12.09	12.09	16.44	▲
Leaf Clean Energy	43.00	22.00	36.05	41.75	▲
PV Crystalox Solar	13.00	7.78	12.81	10.94	▼
Rame energy	11.00	5.75	8.50	7.18	▼
REACT Energy	9.00	2.00	5.25	5.00	▼
Renewable Energy Holdings	2.69	0.70		Suspended	
Rurelec	4.60	0.50	1.07	0.85	▼

Generation tariffs for solar PV

Tariff band	FiT rate (p/kWh) from 01/04/16 - 30/06/16	
< 10kW	Higher rate Middle rate Lower rate	4.25 3.83 0.61
10 - 50kW	Higher rate Middle rate Lower rate	4.46 4.01 0.61
50 - 250kW	Higher rate Middle rate Lower rate	2.09 1.88 0.61
250 - 1000kW	1.75	
> 1000kW	0.61	
Standalone	0.61	

* Currently subject to consultation

FiT deployment caps that have been reached in tariff period 01 (01 April – 30 June 2016)

Deployment band	Cap limit (MW)	Cap reached?	Date and time of final installation to qualify	Capacity deployed (MW)
PV <10kW	76.96	No	N/A	2.56
PV 10-50kW	25.72	No	N/A	0.859
PV >50kW	14.5	No	N/A	6.79
PV standalone	5	Yes	08/02/2016 01:15	12.79
Wind <50kW	11.17	No	N/A	-
Wind 50-100kW	0.3	Yes	08/02/2016 00:15	0.542
Wind 100-1500kW	6.8	Yes	08/02/2016 00:18	21.730
Wind 1500kW-5000kW	10	No	N/A	-
Hydro <100kW	1.1	No	N/A	0.135
Hydro 100kW-5000kW	9.5	No	N/A	-
AD (All)	5	Yes	08/02/2016 00:15	15.67

Accurate as at 00:01 on 15 March 2016

Generation tariffs for non PV technologies

Technology	Band (kW)	Tariffs (p/kWh)
Hydro	< 100kW	7.66
	100 - 500kW	6.13
	500 - 2000kW	6.13
	> 2000kW	4.43
Wind	< 50kW	8.39
	50 - 100kW	6.85
	100 - 1500kW	4.40
	> 1500kW	0.85

(Source: OFGEM)

Cost comparison of heating fuels (not including RHI payments)

Fuel source	kWh provided per unit of fuel	Efficiency of system (%)	Units consumed by house (kWh)	Price per unit of fuel (£)	Units consumed per annum	Cost per annum
Heating oil (kerosene)	10 per litre	90	25300	0.31 per litre	2530 litres	£784
Wood pellets	4800 per tonne	94	24300	256 per tonne	5 tonnes	£1,280
Natural gas	1 per kWh	90	25300	0.04 per kWh	25300 kWh	£1,012
LPG	6.6 per litre	90	25300	0.38 per litre	3833 litres	£1,457
Electricity	1 per kWh	100	23000	0.14 per kWh	23000 kWh	£3,220
*Air source heat pump	1 per kWh	290	7931	0.14 per kWh	7931kWh	£1,110
*Ground source heat pump	1 per kWh	360	6389	0.14 per kWh	6389kWh	£894
Dual mode system 1						
Oil boiler (30% of heat load)	10 per litre	90	7590	0.31 per litre	759 litres	£235
*Air source heat pump (70% of heat load)	1 per kWh	290	5552	0.14 per kWh	5552 kWh	£777
Dual mode system 2						
Gas boiler (30% of heat load)	1 per kWh	90	7590	0.04 per kWh	7590 kWh	£304
*Air source heat pump (70% of heat load)	1 per kWh	290	5552	0.14 per kWh	5552 kWh	£777

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

RHI non-domestic rates

Tariff name	Eligible technology	Eligible sizes	Tariff rate (pence/kWh)	Tariff duration
Small biomass	Solid biomass: Municipal solid waste (inc CHP)	< 200 kWth	Tier 1: 3.26 Tier 2: 0.86	20
Medium biomass	Solid biomass: Municipal solid waste (inc CHP)	200 kWth and above, < 1000 kWth	Tier 1: 5.24 Tier 2: 2.27	20
Large biomass	Solid biomass: Municipal solid waste (inc CHP)	1000 kWth and above	2.05	20
Small ground source	Ground source heat pumps, water source heat pumps, deep geothermal	< 100 kWth	Tier 1: 8.95 Tier 2: 2.67	20
Deep geothermal			5.14	
Solar collectors	Solar collectors	< 200 kWth	10.28	20
Air source heat pumps	ASHPs	All	2.57	20

(Source: OFGEM)

Domestic RHI deployment

Technology	Accreditations (Apr 14–May 16)	% of total
ASHP	22,234	45
GSHP	7,078	15
Biomass	11,627	24
Solar thermal	7,662	16
TOTAL	48,601	100

(Source: DECC)

Number of MCS registered installers per technology

Technology type	Cumulative	Registered May 16
Solar PV	1976	10
Biomass	616	0
Air source HP	998	6
Ground source HP	711	3
Solar thermal	846	1
Small wind	57	0
Total	4482	23

(Figures supplied by Gemserv)

Number of MCS registered installations per technology

Technology type	Cumulative	Installed April 16
Solar PV	866832	3962
Biomass	16599	50
Air source HP	46157	533
Ground source HP	12523	178
Solar thermal	8463	55
Small wind	5041	10
Total	955615	4778

Domestic RHI tariffs

Technology	RHI rate (from 1 April) (p/kWh)
ASHP	7.51
Biomass boilers	4.68
GSHP	19.33
Solar thermal	19.74

(Source: DECC)

My working week

Who are you? Andy King, Director of Energy at engineering and environmental consultancy Sweco UK

What do you do? I lead the UK Energy business for Sweco, with operational responsibility for 80 multi-disciplinary engineers and consultants working across the energy market in offshore and onshore wind, waste management and waste-to-energy/biomass, thermal generation, district heating, gas-to-grid, solar, hydro and grid services. With over 20 years' experience, I oversee pipeline and bidding activity, developing strategy, business planning, resourcing and recruitment

European union: Calling on experts from different countries

Monday

An early start to the week as I am hosting a District Heating (DH) workshop in Edinburgh with several members of my UK Thermal team and three colleagues from the Malmo and Stockholm offices in Sweden. My Swedish colleagues travelled over on Sunday afternoon to be ready for the 9am meeting but I was at a concert on Sunday evening with my wife so I travel to the meeting on Monday morning. It's a 4am start!

We discussed the UK market, its drivers and the state of play for consultancy services. We agree an action plan for growing our share in the market place and utilising the experience and heritage from the Nordics; they have been involved in DH for several decades and have learned all the lessons!

Tuesday

Today I am reviewing our pipeline of opportunities and a couple of interesting schemes have landed. I have a discussion with my Onshore Wind Leader, Mike, who is helping a UK contractor client to tender for a wind farm in the Netherlands. We have delivered more than 3.5GW of onshore wind schemes in the UK since 2007, over half of all that has been built. Following the recent UK government policy shifts on renewable incentives, some of our current UK wind customers are now seeking opportunities overseas. This project will ultimately be the largest onshore wind farm in the Netherlands. We have arranged for Mike to visit the site, meet with the client and team up with our Alkmaar office, which will provide some local project management and design services.

Wednesday

A cross-border call with my Head of Energy colleagues from each country across the Sweco Group. Energy is one of the core growth sectors across the group and we hold regular monthly calls to update each other on activity in each country and to discuss specific pipeline projects and areas for collaboration. Working for a group with 14,500 employees gives me access to a whole range of specialists and experts that we may not have in the UK team. For example, I am using pulp experts from Finland on a UK project, Swedish specialists to support our district heating work and Danish experts on offshore wind projects. Similarly, members of my UK team look to support oversea projects too.

Thursday

Today is a trip into London for a series of meetings with clients and partners. We have secured an energy storage project with a developer with a pipeline of more than 200MW of projects and I am particularly keen to grow our offering in this sector, given its future importance to the nation's energy mix. I am also meeting with one of our partners to discuss progress on a Heat Network Delivery Unit (HNDU) funded District Heating study that we are delivering for a local authority in the Midlands. We discuss study progress, lessons learned, budgets for the next phase, and also explore collaboration on three new opportunities in the market. My final meeting is with a client to whom we have recently delivered the designs for a new energy centre and heat network in London. We catch up on project status and also discuss future projects in this expanding market.

Friday

A welcome day in the office, providing a chance to catch up on paperwork and check the latest happenings in the industry. Working with everyone from investors at initial concept, through to installers and contractors, it is vitally important that I keep abreast of updates in the energy sector.

We also have a Steering Group Meeting for an interconnector project we are working on. We are providing the designs for two new major converter stations, one in England and the other in Belgium. The Steering Group Meeting is with the Project Managers and Directors from both countries to assess project status, deliverables and client satisfaction. The project is going well and despite the implications of Brexit, will at least help to strengthen our energy links with mainland Europe!

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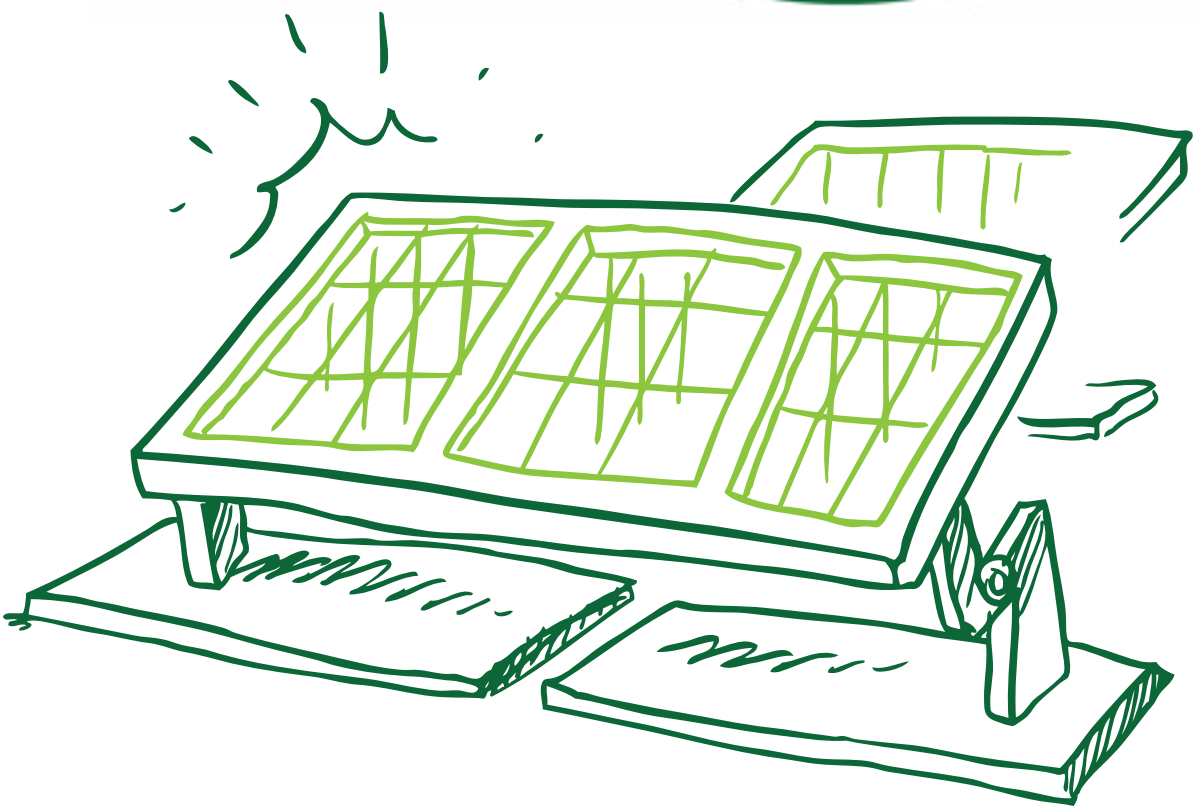

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