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Foreword
Clean Energy Pipeline

Douglas Lloyd
Founder & CEO
Clean Energy Pipeline

I have just returned from a sobering trip to Germany where the mood wasn’t exactly bleak but it certainly didn’t seem upbeat either. Imminent changes to the Renewable Energy Act are threatening Germany’s status as Europe’s leading destination for renewables. The undoubted beneficiary should be the United Kingdom.

In a recent survey we conducted earlier this year we asked the industry where they wanted to invest globally and in which countries they were most likely to acquire assets. As usual the USA was ranked in first place but more importantly, given the focus of this guide, the UK leapt into 2nd place. This is the highest rating the UK has achieved since we started running this survey in 2011. In parallel Germany fell from 2nd to 6th place, adding statistical weight to the downbeat vibe I experienced at our German Clean Energy event in late June. So there you have it, the World Cup may not have been a success but at least the United Kingdom is the leading country for Clean Energy in Europe.

There are challenges, not least the government’s somewhat lukewarm commitment to the Clean Energy sector. However, the overall mood is certainly brighter this year. According to Clean Energy Pipeline data new investment in the first quarter of 2014 exceeded $61 billion globally, representing a 14% year-on-year growth rate. The UK has also established itself as a global pioneer in the YieldCo structure, a new source of capital and creating liquidity that is very new. Funding issues will always be a concern throughout the sector (not just in offshore) but the UK market looks more capable of finding a way to bridge the funding gap than it has done for several years.

This is the third edition of the Clean Energy UK Finance Guide and by far the largest with contributions from almost twenty different institutions active in the sector in the UK. More than ever, we have achieved our goal of producing a definitive guide to investment in the UK Clean Energy sector... and it’s free to download to anyone!

Lastly and as always I would like to thank our sponsors for all their support as well as my research team. I hope to meet you at the guide’s launch event at Taylor Wessing’s offices in London on July 7th.

Douglas Lloyd
Founder & CEO
Clean Energy Pipeline
www.cleanenergypipeline.com
In the 12 months since the release of last year’s UK Green Investment Guide, the UK investment landscape has undergone significant change. Solar PV has emerged as the dominant renewable energy technology and is being deployed at a scale not seen before in the UK. It is estimated a record 1.45 GW of new ground mounted solar capacity was built in 2013, with large-scale installations growing by a staggering 600%. The growth has continued in 1Q14, when an estimated 1.1 GW of new capacity was brought online.

The regulatory framework for renewable energy in the UK is driven by the 2009 EU Renewable Energy Directive and the 2008 Climate Change Act.

The EU Renewable Energy Directive 2009 (EU RED) requires the UK to source 15% of energy from renewable sources by 2020. In order to achieve this target it is expected that 30% of electricity generation would need to come from renewable energy.

The Climate Change Act 2008 established the world’s first legally binding climate change target, with a commitment to reduce the UK’s greenhouse gas emissions by at least 80% (from the 1990 baseline) by 2050. The fourth carbon budget committed the UK to reducing its CO2 emissions 50% by 2027. However, while the UK has a carbon reduction target it does not have a renewable energy target other than that set out in the EU RED.

In order to achieve the 2020 target, a 17% per year increase in deployment of renewable energy will be required and it is estimated that the size of investment required is c.£110 billion.

**POLICY OBJECTIVES**

The UK government’s policy objectives are:

- to ensure security of supply;
- to meet decarbonisation targets; and
- to provide energy affordability for consumers.

The government seeks to achieve this through a number of support mechanisms and obligations focused primarily on the decarbonisation of generation but also energy efficiency.

**DECARBONISATION**

**Renewables Obligation**

Since 2002 the Renewables Obligation (RO) has been the main support mechanism for renewable energy in the UK. The RO imposes an obligation on electricity suppliers to source an increasing proportion of electricity generation from renewable sources.

Suppliers may satisfy this obligation by sourcing Renewables Obligation Certificates (ROCs) and surrendering...
though these or paying a “buy-out price”, or a combination of both. ROCs are tradable instruments that are sold separately from the electricity. ROCs are issued for 20 years from the later of accreditation of the generating station under the RO and commissioning.

Under the scheme, eligible renewable generators are issued a pre-determined number of ROCs in respect of each megawatt-hour (MWh) of eligible renewable electricity they generate during an obligation period (running from 1 April to 31 March). Different numbers of ROCs are issued depending on the type of renewable energy source. A table summarising the banding levels for the banding review period (2013-17) in England and Wales is set out below.

ROCs are sold by the generator to an electricity supplier, and are used by the electricity supplier as evidence that they have been supplied with the requisite percentage of renewable energy to meet their obligations under the RO for that obligation period. ROCs can only be redeemed by an electricity supplier against the obligation period in which they are issued or against the preceding obligation period.

If electricity suppliers do not surrender enough certificates to cover the required percentage of their renewable energy output, they are obliged to pay a buy-out price for any shortfall. The buy-out price is set each year by Ofgem and increases in line with changes in the Retail Price Index.

The obligation level for 2014/15 is 0.244 ROCs/MWh in Great Britain and 0.107 ROC/MWh in Northern Ireland. The obligation level is set by taking the higher of (A) a predetermined fixed target and (B) the estimated number of ROCs that will be available in an obligation period plus 10%. The current buy out price is £43.30 per ROC.

As part of the ongoing Electricity Market Reform the RO will close to new applications from 31 March 2017. However, generation stations that have been accredited under the RO will continue to be eligible to receive ROCs until 2037. From October 2014, a new Contracts for Difference (CfD) regime will come into force and most renewable energy technologies that are eligible to participate in the RO will have a choice whether to participate in the RO or the CfD regime until the RO closes to new applicants in March 2017. However, the government proposes to exclude new large-scale solar PV projects (or extensions of existing projects) from the RO from 1 April 2015, subject to a grace period for solar PV projects that have either (i) preliminary accreditation

<table>
<thead>
<tr>
<th>Band</th>
<th>Pre-13 Capacity</th>
<th>12/14 Capacity</th>
<th>14/15 Capacity</th>
<th>15/16 Capacity</th>
<th>16/17 Capacity</th>
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<tbody>
<tr>
<td>Advanced gasification/pyrolysis</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1.9</td>
<td>1.8</td>
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<tr>
<td>AD</td>
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<td>2</td>
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<td>1.8</td>
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<tr>
<td>Energy from waste with CHP</td>
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<tr>
<td>Geothermal</td>
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<td>0.7 (1 ROS)</td>
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<td>2</td>
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<td>1.8</td>
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<tr>
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<tr>
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<td>2</td>
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<td>1.8</td>
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<td>New band</td>
<td>2.5</td>
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<td>New band</td>
<td>3.5</td>
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<tr>
<td>Solar PV (building mounted)</td>
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<td>1.7</td>
<td>1.6</td>
<td>1.5</td>
<td>1.4</td>
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<tr>
<td>Solar PV (ground mounted)</td>
<td>New band</td>
<td>1.6</td>
<td>1.4</td>
<td>1.3</td>
<td>1.2</td>
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<tr>
<td>Standard gasification/pyrolysis</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1.9</td>
<td>1.8</td>
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<tr>
<td>Tidal barrage (&lt;1GW DNC)</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1.9</td>
<td>1.8</td>
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<tr>
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<td>2</td>
<td>2</td>
<td>2</td>
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<td>1.8</td>
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<tr>
<td>Tidal stream</td>
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<td>2</td>
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<td>2</td>
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<tr>
<td>Tidal stream - enhanced (ROS)</td>
<td>3</td>
<td>3</td>
<td>3</td>
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<td>3</td>
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<tr>
<td>Wave - enhanced (ROS)</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>
under the RO or (ii) have an accepted grid connection offer, planning consent, and ownership of land for the project on or before 13 March 2014 and where the developer or proposed operator of the station has incurred a minimum of £100,000 per MW of expected capacity in pre-commissioning costs or entered into all material equipment contracts.

Feed-in tariffs

In April 2010, the Feed-in Tariff (FiT) regime was introduced. This provided a much simpler support mechanism for small-scale renewable energy generation.

Feed-in Tariffs are paid for both electricity generated by an eligible renewable energy system and also for energy which is exported to the grid. The payments are made by the energy suppliers and the tariff levels are index-linked to the Retail Price Index.

Feed-in Tariffs are intended to support small-scale renewable electricity (installations with generating capacity up to a maximum of 5MW of electricity). The following technologies are eligible: anaerobic digestion to produce biogas for electricity generation; hydro-electric power; solar electric photovoltaics (PV); wind power; and non-renewable micro-CHP installations with generating capacity up to 2kW of electricity (only the first 30,000 installations are eligible as this is on a pilot scheme basis).

Feed-in Tariffs are paid for both electricity generated by an eligible renewable energy system and also for energy which is exported to the grid. The payments are made by the energy suppliers and the tariff levels are index-linked to the Retail Price Index.

FIT generation tariffs

A generation tariff will be paid by the energy supplier for each kWh of electricity generated and metered by a FiT generator. The level of tariff and the lifetime during which payment will be made varies depending on the technology type and the capacity. Tariffs will last for 20 years for most of the generating systems, except for solar PV, which runs for 25 years for systems installed before 1 August 2012 and micro-CHP (10 years). If there is more than one system generating electricity, each type of renewable energy will be metered separately.

The tariff will be paid regardless of whether the electricity is used on-site or exported to the local electricity network.

Once a project has been allocated a tariff, it remains on that tariff (subject to alterations in the Retail Price Index) for the life of the installation or the life of the tariff, whichever is the shorter.

A price degression mechanism for solar PV was introduced in 2012. A degression mechanism for hydro, wind and anaerobic digestion was introduced in 2014. Degression of solar tariffs occurs on a quarterly basis. Degression for other technologies occurs annually.

If deployment of solar PV is less than a baseline, no degression will apply. Degression can only be skipped for two consecutive quarters, so there will be a minimum degression of 3.5% in each nine month period. If deployment is above the baseline, tariffs will degress between 3.5% and 28% depending on the level of deployment and declared net capacity (DNC) of the installations. (Separate thresholds apply for installations with DNC ≤10kW, <10kW≤50kW and >50kW). The new tariffs are based on deployment in the previous three months and are published at least two months before each three-monthly degression period starts.

The deployment period for non-PV technologies is the calendar year ending three months before degression rates change. The degression mechanism for non-PV
technologies (other than micro CHP) takes effect on an annual basis in April (from April 2014). The degression rate varies for all technologies as it is dependent upon each separate technology’s deployed capacity in the previous calendar year. There is also a mechanism in place to allow the Government to make a six-monthly “contingent” degression to tariff rates, should deployment of a technology exceed certain thresholds.

Solar PV installations with an eligibility date on or after 1 April 2013, which are wired to buildings (other than community energy installations and schools) that do not meet an Energy Performance Certificate (EPC) rating level D or above will receive a lower tariff rate than those that satisfy this energy efficiency standard.

Current tariffs for capacity installed after 30 June 2014 range from 9.49 to 12.46 p/kWh for anaerobic digestion, 3.32 to 21.12 p/kWh for hydro, 3.4 to 17.78 p/kWh for wind and 6.38 to 14.38 p/kWh for solar depending on capacity and installation.

A multi-installation tariff applies to solar PV installations with a total installed capacity of 250kW or less, an eligibility date on or after 1 April 2012 and where the FiT generator or its nominated recipient and connected persons already receive FiT payments from 25 or more other eligible solar PV installations. The multi-installation tariff is essentially a middle-rate tariff. However, if the energy efficiency requirement is not met, the lower tariff will still apply.

Current tariffs for capacity installed after 30 June 2014 range from 9.49 to 12.46 p/kWh for anaerobic digestion, 3.32 to 21.12 p/kWh for hydro, 3.4 to 17.78 p/kWh for wind and 6.38 to 14.38 p/kWh for solar depending on capacity and installation.

FiT export tariffs

For exported energy, FiT generators are entitled either to receive a guaranteed tariff for any electricity generated and exported to the local electricity network or to opt out of the export tariff and sell their electricity on the open market. The generator is able to decide which option to pursue each year but will only be able to change between guaranteed export payments and market payments no more frequently than every 12 months.

The export tariff from 1 July 2014 is 4.77 p/kWh.

Climate Change Levy

The Climate Change Levy (CCL) is a levy on supplies of electricity, gas and solid fossil fuels in the UK to businesses (subject to certain exemptions). Electricity generated from renewable sources is exempt from the CCL and generators of renewable electricity are issued with Levy Exemption Certificates (LECs) that evidence the origin of the electricity. LECs are evidence that electricity supplied to UK business customers is CCL exempt. The final customer realises the exemption from the tax. The tax rate for electricity is set within the Finance Bill each year as part of the Budget.

The current levy on electricity is 0.541p/kWh.

Renewable Transport Fuel Obligation

In 2008 the RO was supplemented by the Renewable Transport Fuel Obligation (RTFO). Under the RTFO suppliers of transport and non-road mobile machinery fuel in the UK must be able to show that a percentage of the fuel they supply comes from renewable and sustainable sources. Fuel suppliers who supply at least 450,000 litres of fuel a year are affected.

A review of the RTFO in April 2014 concluded that further work should be undertaken to review recommendations for:

- an additional support mechanism for advanced and more sustainable fuels;
- policy changes to provide more certainty to suppliers, such as a price floor for RTFO certificates or separate obligations for petrol and diesel substitutes;
- adding support for some fuels from fossil waste to the RTFO; and
- support for low-carbon fuels in the shipping and aviation sectors.
Renewable Heat Incentive

In November 2012 the Renewable Heat Incentive (RHI) was launched. This is the first renewable support scheme in the world to support heat from renewable sources. The scheme is divided between non-domestic RHI and domestic RHI. Tariffs are payable for 20 years.

The non-domestic RHI applies to solid biomass, biogas below 200kWth, ground and water source heat pumps, geothermal, solar thermal and energy from waste. For plant first commissioned on or after 4 December 2013 the following technologies are eligible: air to water heat pumps, biogas ≥200kWth and a CHP system which generates heat from either solid biomass, biogas or waste in combination with any other source of energy (with some limits on individual technologies). Tariffs range from 2p/kWh for large commercial biomass to 10p/kWh for solar collectors (each commissioned on or after 4 December 2013).

Domestic RHI applies to single domestic dwellings and is payable per unit of heat generated from air-source heat pumps, ground and water source heat pumps, biomass only boilers and biomass pellet stoves with integrated boilers and solar thermal panels (flat plate and evacuated tube for hot water only), with tariffs between 7.3p/kWh for air-source heat pumps to 19.2p/kWh for solar thermal panels.

ENERGY EFFICIENCY

Green Deal and Energy Companies Obligation

In 2013 the government launched the Green Deal and the Energy Companies Obligation (ECO), replacing the Carbon Emissions Reduction Target and the Community Energy Saving Programme. The Green Deal allows consumers to contract with approved providers to carry out energy efficiency improvements and to pay for these works through an adjustment to their electricity bills. The ECO places an obligation on larger energy suppliers to deliver energy efficiency measures to domestic energy users with a particular focus on vulnerable consumer groups and hard-to-treat homes.

AFFORDABILITY

Levy Control Framework

Following the 2010 Spending Review the Department of Energy and Climate Change (DECC) and HM Treasury introduced the Levy Control Framework (LCF) to oversee and control the cost of levies on electricity suppliers with the objective of making sure that DECC “achieves its fuel poverty, energy and climate change goals in a way that is consistent with economic recovery and minimising the impact on consumer bills”.

Levy Control Framework caps for electricity policies rise to 2020-21

Source: Department of Energy & Climate Change
The Renewables Obligation (RO), Feed-in Tariffs (FiTs) and some other schemes are effectively levies on electricity suppliers to pay for the support for renewable energy, and the costs are then passed on to consumers. The LCF imposes caps on levy-funded spending in each financial year and requires DECC to develop action plans with HM Treasury to bring spending on levies or support measures that fall within the LCF within these caps.

The LCF currently applies to the RO, FiTs and the Warm Home Discount (which is a single discount scheme to relieve fuel poverty). When the CfD regime under the Electricity Market Reform comes into place the CfD scheme will also fall within the LCF. (The Renewable Heat Incentive (RHI) is not a levy on suppliers and is funded out of general taxation so does not fall within the LCF.)

In November 2012 DECC announced an upper limit of £7.6 billion (in 2011 to 2012 prices) on spending until 2020-21 for the combined cost of RO, FiTs and CfDs (but not capacity market payments). If expenditure is projected to exceed the cap by 20% DECC is required to take steps to bring spending below the cap.

The profile of annual caps on these policies between 2014 and 2021 is set out on the previous page.

The LCF was cited as the reason for the ongoing consultation on the removal of large-scale solar from the RO with effect from 1 April 2015. Whereas the FiTs regime now has certain safeguards against higher than forecast deployment for solar PV, the RO does not. The EMR Delivery Plan forecasts a potential range of 2.4-4GW for large-scale solar by 2020. However, solar deployment is estimated to be 3.2GW by 1 April 2015, which would result in large-scale solar taking up more of the LCF budget than planned and reducing the budget available for CfDs and other incentives. It is therefore proposed to remove large-scale solar from the RO.

**ELECTRICITY MARKET REFORM**

The Energy Act 2013 is the enabling legislation that is intended to allow reform of the electricity market for the purpose of encouraging low carbon electricity generation and ensuring security of supply.

Electricity Market Reform (“EMR”) is the government’s initiative to ensure the UK secures the investment needed to safeguard electricity supplies in the UK, as well as decarbonising electricity generation in the UK and keeping energy prices at an affordable level for consumers. The government has drawn together a package of reforms to try and achieve its EMR goals, which include the introduction of the following mechanisms:

- Contracts for Difference;
- Carbon Price Floor (in effect a tax on fossil fuels used to generate electricity);
- Emissions Performance Standard (annual limit on CO2 emissions of fossil fuelled plant); and
- a new auction-based Capacity Market.

**Contracts for Difference**

Contracts for Difference (CfDs) will replace the Renewables Obligation as the support mechanism for large-scale low carbon generation with effect from 31 March 2017 for new developments. CfDs will be available for renewable energy as well as nuclear and fossil fuel plant with carbon capture and storage (CCS).

Whereas ROCs are tradable instruments, CfDs will be bilateral contracts entered into between The Low Carbon Contracts Company and an Eligible Generator who is allocated a CfD. The Low Carbon Contracts Company is a company incorporated under the laws of England and Wales and owned by the government. CfDs will have a term of 15 years, save that biomass conversion generation will only be eligible for payments until 2027, whenever signed. The Secretary of State has flexibility to adjust the
term of the CfD where the technology justifies it (possibly for nuclear, CCS and tidal).

CfDs will provide for payments from The Low Carbon Contracts Company to the CfD holder when the reference price of electricity is less than the strike price of the CfD and payments from the CfD holder to The Low Carbon Contracts Company when the reference price is more than the strike price. The reference price is determined by the hourly day ahead price of electricity for intermittent generation or the season ahead price for base load generation (eventually it is intended that the seasonal price will move to a year ahead price). CfDs therefore stabilise returns for generators at the “strike price”. Generators will receive revenue from selling their electricity into the market as usual. The reference price for the purposes of the CfD is not the same as the price at which the generator actually sells its generated electricity.

CfDs will apply to the generation capacity that the CfD holder has stated that it intends to construct (or less if so provided). CfD holders will have flexibility to reduce capacity by up to 25% provided that this election is made no later than the milestone delivery date stated in the CfD. CfD holders will be eligible to receive payments under the CfD provided that the generator delivers at least 95% of the contract capacity. The Low Carbon Contracts Company will be able to terminate the CfD if the CfD holder delivers less than 95% of the contract capacity or if other conditions precedent are not satisfied by the contractual long-stop date.

CfD holders will be required to demonstrate progress on the delivery of the project by a milestone delivery date. This can be shown by demonstrating that the CfD holder has spent 10% of the total project costs or evidence of progress towards timely commissioning such as construction and supply agreements.

If a CfD holder fails to make a payment due under the CfD three times in any period of 12 months, then The Low Carbon Contracts Company can call for adequate collateral (such as a letter of credit) to be provided.

CfDs will provide some change in law protection for unforeseeable changes targeting specific technologies, projects or CfD holders or discriminatory effects and for compensation to be paid to the CfD holder in these circumstances.

Strike prices are indexed to CPI and will either be set by an auction process or an administratively set price. For the first round of allocations in 2014, at least, there will be two groups:

Group 1 will be subject to competitive auctioning and consists of “established technologies”, being Onshore Wind >5 MW, Solar Photovoltaic (PV) >5 MW, Energy from Waste with CHP, Hydro >5 MW and <50 MW, Landfill Gas and Sewage Gas.

Group 2 will consist of “less established technologies”, being Offshore Wind, Wave, Tidal Stream, Advanced Conversion Technologies, Anaerobic Digestion, Dedicated Biomass with Combined Heat and Power, and Geothermal.

In the first phase of EMR, Group 1 will be subject to competitive auctioning. Strike prices for Group 2 will initially be determined administratively without auctioning.

**CfD budget and allocation**

The Secretary of State will determine the CfD Budget for each delivery year. He may specify maximum and minimum allocations of the budget to specified technologies. The budget will be divided, though not necessarily equally, for each delivery year of the allocation round. The government may hold back part of the CfD budget.

DECC will provide National Grid with the available budget and maximum and minimum allocations for each technology type if applicable. An indicative budget will be published in July and a final budget notice will be published at the end of September confirming the budget allocations, to coincide with when the Renewables Obligation Order is issued.

The process for awarding a CfD will progress in phases. The first CfD application round will open in October 2014 when the eligibility of applicants will be assessed and also
the value of eligible bids will be determined. If the budget available enables the eligible bids to be met, National Grid will recommend that The Low Carbon Contracts Company offers CfDs to participants. If the eligible bids exceed the budget available, then eligible generators may be required to submit a sealed bid for the CfD auction in December. Assuming that there are no appeals, CfD contracts will be offered to developers later that month and come into effect from January 2015.

"The CPF was introduced in April 2013. The CPF has the effect of making supplies of fossil fuels used in most forms of electricity generation liable for tax charges under either the Climate Change Levy (CCL) or (for oils) fuel duty. Supplies will be charged at the relevant Carbon Price Support (CPS) rate, depending on the type of fossil fuel used.

If a technology budget’s allocation for any year is exceeded then an auction will be run for all delivery years. If a maximum is exceeded but the budget is not, then an auction will only be run for the remaining technologies. Sealed bids will only be requested where constrained allocation is triggered and then only for the technologies to which constrained allocation applies. Successful applicants will be paid a “pay as clear” price meaning that each applicant in the relevant auction will be paid the highest price offered which is accepted in order to deliver the allocated capacity. Each delivery year will have a separate clearing price.

The Implementation Timetable published in April 2014 envisages:

• publication of the initial projected CfD Budget in mid-July 2014;
• publication of the final CfD budget at the end of September 2014;
• CfD applications results announced on 18 November 2014;
• where competitive bidding is required, the sealed bids being submitted between 26 November and 3 December 2014, with awards announced on 29 December; and
• CfDs signed by no later than 27 January 2015.

Carbon Price Floor

In the 2011 Budget the government announced that it would introduce a Carbon Price Floor (CPF) for electricity generated from fossil fuels. The CPF was introduced in April 2013. The CPF has the effect of making supplies of fossil fuels used in most forms of electricity generation liable for tax charges under either the Climate Change Levy (CCL) or (for oils) fuel duty. Supplies will be charged at the relevant Carbon Price Support (CPS) rate, depending on the type of fossil fuel used.

In order to achieve the CPF set for any given year, the CPS rate charged will be the difference between the future market price of carbon and the floor price. The entity that will be liable to pay the CPS rate to HMRC will be whoever was the final supplier of fuel to an electricity generator.

With effect from 1 April 2015, fossil fuels used in CHPs to generate good quality electricity used on site will benefit from an exemption from the CPF. Draft legislation will be published in Autumn 2014.

Emissions Performance Standard

The Emissions Performance Standard (“EPS”) will impose an “emissions limit duty” on operators of new fossil fuel power stations and associated CCS plant. This will require such plant to ensure that they keep their CO2 emissions within specified limits in each year of operation.

The specified annual limit is to be set at 450g of CO2/kWh for a plant operating at baseload. This limit will apply until 2045 and is applicable to fossil fuel plant of at least 50MW that are built pursuant to a relevant consent dated on or after EPS provisions come into force. The EPS will not apply retrospectively to power stations that have already been consented (except in the case of significant upgrades).

The specified annual limit of 450g of CO2/kWh means that, in practice, operators of new fossil fuel plant will be given a total tonnage allowance of CO2 within which they will have to remain each year. The total tonnage allowance will be calculated for each fossil fuel plant individually and will be based on actual reported emissions.

Compliance with the EPS will be assessed based on the annual CO2 emissions that are reported for the purposes of the EU Emissions Trading System (“EU ETS”). For most plant operators, this should mean that there will not be any additional administrative requirements over and above those already imposed by the EU ETS.

The Capacity Market

Ensuring security of electricity supply is one of the government’s stated objectives for EMR. There is a potential risk in the future that, as a result of a large amount of existing fossil fuelled plant being closed and an increasing number of intermittent and inflexible energy sources being brought online instead, capacity may not be sufficient to meet demand at certain times.
The government is therefore introducing a Capacity Market (“CM”). It is envisaged that the CM will function as follows:

- A forecast of future peak demand will be made.
- The total amount of capacity needed to ensure security of supply will be contracted through a competitive central auction a number of years ahead. The first auction will take place in December 2014 (subject to State Aid clearance) for capacity to be in place for winter 2018. The government is running two transitional auctions in 2015 and 2016.
- Successful bidders will enter into capacity agreements, committing to provide electricity when needed in the delivery year (in return for a steady capacity payment) or face penalties.
- The costs of capacity payments will be shared between electricity suppliers in the delivery year.
- The capacity auctions will be capped at £75/kW to protect consumers and the CM will last for 15 years.

Capacity providers may well be required to satisfy certain pre-qualification criteria before being allowed to bid in a capacity auction. Informal auction guidelines were published in June and the formal guidelines will be published in August, so that pre-qualification will commence in early August. At present, it is thought that plants in receipt of payments under a CfD will be excluded from participating in the CM so as to avoid overcompensation of low carbon generating plants.

**Backstop power purchase agreements**

The Government is introducing a mechanism to provide power purchase agreements (PPAs) to independent power producers who are struggling to find access to a long-term PPA by providing an “offtaker of last resort” mechanism which would require certain suppliers to enter into a backstop PPA at a discount to market price with a generator who holds a CfD. The price will be discounted to the CfD strike price so as to incentivise generators to seek PPAs in the open market first. Legislation is anticipated to be in place at the time when the CfDs are signed in 2015.

This article was prepared on 20th June 2014. The details of the EMR are still evolving and so the above summary will not reflect changes after that date.
Intermittent certainty

In many ways 2013 represented another typical year for the renewables industry with technology costs falling and political voices rising. We expect these trends to continue in 2014 with further innovation and important votes on Scottish Independence, European parliamentary elections and the UK national election in the pipeline. It is in this context the UK renewables industry must consider its continued progression towards EU 2020 renewable energy targets.

Changing winds

The rising political noise comes as the global economic outlook is improving. The UK is experiencing its strongest growth since the financial crisis and according to the IMF is set to be the fastest growing economy in the G7 this year. Elsewhere in Europe there are also sustained signs the economic recovery is building momentum. This should be encouraging news for the renewables industry, which will also benefit from associated increases in energy demand and rising investment. However, these benefits come with new political risks as disillusioned voters tired of austerity are increasingly drawn to populist anti-establishment political parties who often pursue anti-renewables policies. These parties tend to be vocal in their dislike for “expensive” renewable energy technologies and “costly” carbon reduction programmes. In the UK these messages are particularly pertinent as the various political parties begin to position themselves for the general election in 2015. This creates additional political risk for renewable energy investors unsure which way energy policy will swing in what is expected to be a tight election.

Enduring trilemma

With increasingly populist arguments coming to the fore concerning the energy sector it is worth reminding ourselves of the three fundamental principles driving the evolution of the sector. These are the need for energy security (as recently highlighted by the crisis in the Ukraine), affordability (often linked to the cost of living debate) and decarbonisation (as embodied in the EU carbon and renewable energy targets for 2020). Of these, the drive to decarbonise is the one most often overshadowed in times of economic strife, as affordability
demands and pressing energy security concerns take precedent. However, the imperative to meet the EU carbon and renewable energy targets continues to grow and was recently emphasised in the latest International Panel on Climate Change (IPCC) report, which found carbon emissions were still growing and the rate of growth is in fact increasing. To turn this tide the report concludes further measures should be taken to ensure renewable energy becomes the major energy generation platform for the future. In this context establishing new 2030 targets is seen as an important means for building investor confidence, ensuring a liquid pool of capital and maintaining development momentum post 2020.

Creative destruction

The performance improvements and cost reductions experienced in these sectors and most notably in solar and onshore wind have led to rapid deployment at scale in the UK. In the UK onshore wind is now considered the most mature, bankable and scaleable technology to deploy in the run up to 2020 with solar PV hot on its heels. These two technologies have both benefited from the support provided under the existing Renewables Obligation (“RO”). Despite the occasional RO banding review this continued support has generally provided projects with a long enough runway for them to be financed and built with a high degree of confidence.

However, challenges remain as the speed of change has proved disruptive to all but the most carefully crafted government forecasts. This in turn has put increasing pressure on government funding mechanisms and the domestic and commercial energy bills which support them. Adapting to these changes without undermining the investment case for renewables is proving challenging and a sufficiently robust policy framework has yet to emerge flexible enough to accommodate the fast pace of change without significant short-term interventions.

Safeguarding havens

In spite of these periodic policy revisions the UK renewables sector has been a relative safe haven for renewable energy investors. This is largely due to the government’s strong commitment to grandfathering support for renewable energy projects and avoiding retroactive changes to support mechanisms.

Certainly the case for transforming to a renewables based future has been significantly enhanced in recent years by the substantial performance improvements and cost reductions realised across a number of mature technologies. According to the IPCC report, costs for solar PV systems fell by 57% between 2009 and 2014. Costs for other technologies also showed significant reductions over the period with onshore wind decreasing by 15%, landfill gas by 16%, municipal solid waste by 15% and biomass gasification by 26%. In some instances large-scale hydropower, larger geothermal projects and onshore wind power plants are already competitive alongside traditional energy sources.

In spite of these periodic policy revisions the UK renewables sector has been a relative safe haven for renewable energy investors. This is largely due to the government’s strong commitment to grandfathering support for renewable energy projects and avoiding retroactive changes to support mechanisms. This has been a necessity for investor confidence in the sector and has delivered over £34 billion of investment in large scale renewable electricity since 2010. However, despite this success a further £100 billion is still needed if the UK is going to meet its 2020 targets. Ensuring this is possible without placing an undue burden on taxpayers is a tricky equation and it is important for the government to find a sustainable balance between attracting the necessary capital and ensuring value for money.

Victim of success

The solar PV industry is the latest sector to fall victim to these competing pressures as evidenced by the government’s recently announced consultation on solar PV, which proposes an end to Renewable Obligation (RO) support for ground mounted solar above 5MW. This unexpected announcement follows a period of rapid deployment in large scale solar PV which has outpaced official forecasts and is putting undue pressure on the Government’s Levy Control Framework (LCF), which sets the overall annual limit on DECC’s levy-funded policies. DECC’s latest forecasts suggest 3.2GW of large scale solar PV will be built by April 2015 (previous forecasts suggested this level of deployment would not be achieved until 2017).
Brave new world

The solar consultation brings into question the future of large scale PV in the UK and represents a significant deviation from previously expressed government intentions. In the short term the industry will continue to connect 1.4 ROC projects until the end of March 2015, but any project at risk of being commissioned after this date will need to get up to speed with the government’s new Contracts for Difference (CfD) support mechanism, which will take the place of the RO for large scale solar projects. This new support mechanism will expose solar PV to a competitive price discovery allocation process in which mature renewables technologies including onshore wind, solar and biomass co-firing will all compete to secure CfDs.

Key questions to be addressed in the lead up to the first allocation round in October include how many megawatts will be available to bid on for solar and will other eligible technologies such as onshore wind also be competing for CfDs?

Tempting fate

Further details on the overall allocation and bidding process have yet to be published and it is these details which will ultimately dictate the fortunes of solar developers in the UK post March 2015. Key questions to be addressed in the lead up to the first allocation round in October include how many megawatts will be available to bid on for solar and will other eligible technologies such as onshore wind also be competing for CfDs? However, until the government publishes its response to the solar consultation (expected in July) there is little developers and investors can do but muse about potential bidding strategies and known risks associated with the new CfDs.

With the solar market expected to cool in the second half of the year, equity funders and project finance lenders are already starting to look at alternative investment strategies for next year. Bio-energy is seen as having considerable potential with some investors even looking to fund semi-merchant projects. This continued investor appetite for the UK energy market is encouraging but both developers and investors should expect further policy revisions in the future, especially where technology specific deployment forecasts are expected to exceed official forecasts. The fortunes of the large scale solar sector represent a cautionary tale for other technologies with equally disruptive potential.

Intermittent certainty

The renewables industry can hope for sustainable, predictable and dynamic support policies but would be wise to prepare for more uncertainty and last minute policy twists. Living with this state of intermittent certainty is to embrace discomfort and change but developers and investors should take some comfort that the fundamental forces shaping renewables policy in Europe and the UK remain strong and will continue to grow.

Key questions to be addressed in the lead up to the first allocation round in October include how many megawatts will be available to bid on for solar and will other eligible technologies such as onshore wind also be competing for CfDs?  

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Risk & reward in Europe’s biggest solar market

Robert Goss is Managing Director of the UK & Ireland arm of Conergy, one of the world’s biggest downstream solar companies, which specialises in the development, finance, design, construction, operation and maintenance of solar assets. Founded in Hamburg in 1998, Conergy is majority-owned by Miami-based Kawa Capital Management, and has been responsible for building 650MW of large turnkey projects worldwide, and the operations and maintenance of 300MW of capacity. In the UK, the company has built and manages 120MW of solar farms for a diverse group of investors including RWE, Lightsource Renewable Energy and Primrose Solar.

2014: $4bn in deals and counting

When Conergy built Britain’s first 5MW solar farm in 2011, there were few that would have bet on PV becoming a significant contributor to the UK energy mix. It is well known today that the solar industry’s capacity to develop projects has expanded rapidly in response to fast-growing appetite among investors for relatively low-risk assets delivering long-term returns of 6-8% per annum.

In the first half of this year alone, there were deals amounting to $4bn on close to 50 2MW-plus solar farms, almost three times the amount in the same period last year, funded by a mix of feed-in-tariffs (FiTs) and Renewable Obligation Certificates (ROCs). In the first quarter alone this amounted to 1.1GWp in new free-field capacity, compared with 200MWp for the residential and commercial rooftop markets.

The outlook for large-scale solar in the second half of 2014 and first quarter of 2015 looks very strong. At the time of writing, of 198 projects in the pipeline, more than 80 have planning consent. By year end, solar could account for as much as 5GWp, a long way from Germany’s installed capacity of 35GWp, but still representing over 10% of average UK peak demand. In this article I examine the opportunities for investors to participate, as well as risks and uncertainties.

The hot periods for investing in solar farms

Over the lifecycle of a solar farm development, the project is gradually being de-risked, requiring different kinds of capital. There are five ‘hot’ periods for different types of investors, each with its own risk profile. The first is the high-risk development finance phase, in which land is secured and approvals sought from local planning and the DNO for a grid connection. The second is the acquisition of the rights to a project, followed by project finance during which the solar farm is built. The fourth is the sale to an investor, and the fifth the refinancing or resale of the asset, typically once it has a P&L track record.
1. Development finance

Development finance in solar is most readily comparable with project finance in the construction industry, with finance valued principally on land security and the likelihood of planning consent. Land availability for solar farm developments is surprisingly good in the UK and securing an exclusive lease option or option to purchase is relatively straightforward. Greater challenges for developers lie in approvals for a grid connection and planning consent.

"Selecting the right development partner is important therefore to reducing investment risk through planning. A good developer will identify the right sites in advance, listen to local community issues and design projects that appeal to them."

Conservation-minded Britain has some of the strictest planning laws worldwide. Delays in planning, which is run by local councils, can occur throughout the process, from pre-consultation and validation to approval by the local planning committee. The discharge of conditions can sometimes require even minor amendments to the proposal, which can result in further delays.

Most citizens in the UK vary between being outright positive about solar farms to ambivalent, in particular since unlike wind farms, they are mostly hidden from view behind the nation’s tall hedgerows. Although the shrill British media often reports on the shocking “industrialization” of England’s green and pleasant land and groups of campaigners have blocked some developments, government figures find growing support for clean power, with 59% of Britons in favour of renewable energy projects in their local areas.

There are still politics at play in some local councils that can weigh on decision-making, but the majority of these organisations are in fact pro-solar, often with targets for delivering renewable energy and reducing carbon dioxide emissions. Conergy is building a 37MW solar farm for RWE in Prime Minister David Cameron’s rural constituency Witney, and has thus far encountered no criticism of the project, despite a significant number of Conservative politicians pretending that climate change does not exist and expressing hostility to any form of renewable energy project.

This group nevertheless has some sway in national government. Conservative MP Eric Pickles, State Secretary for Local Government and Communities, currently insists that any solar farm scheme over a certain size, or located in the Green Belt, pass through his office for a final round of review before planning approval. This introduces delays, and – in an election year – more politics than previously seen in planning applications.

Planning approvals, once consented, can also be revoked, as in the case of British politician and landowner Richard Drax, who received a planning application for a 28 MW solar farm to be built on his Dorset estate by developer Good Energy. A branch of the national NGO Campaign to Protect Rural England (CPRE) conducted a high-profile campaign requesting the government to intervene and request the application be heard before a court - a ‘judicial review’. This happens only rarely, since applicants must have strong evidence that local procedures have not been followed correctly, so in practice, few decisions end up in court.

Selecting the right development partner is important therefore to reducing investment risk through planning. A good developer will identify the right sites in advance, listen to local community issues and design projects that appeal to them. Conergy for example has developed a project involving revenue share with a local parish council, which has brought welcome support from the community.

Parts of south-west and eastern England are already described as saturated with new power plants, although
Though there are still good chunks of land available in these regions with capacity to draw more electricity. The reality is that the UK’s Distribution Network requires significant amounts of new investment, in particular if solar and wind are to grow significantly in the future.

There have been cases of developers paying hundreds of thousands of pounds to build their own power lines to the grid, but the best sites will have an appropriate connection either on location or via a simple cable run – ideally along the landowner’s land or highways. As the grid becomes busier with connections, so it can only accommodate connections at ever-higher voltages.

Unfortunately, connection costs are also higher at higher voltages, which partly explains the growth in the size of plants. Typically a 66kV connection will only be viable above 15 MWp, the standard connection of 33kV viable only above 4 MWp, and an 11kV connection above 2 MWp.

The DNOs publish grid ‘constraint’ maps online, showing both thermal and voltage constraints, but there can be no cast-iron certainty for a given project until a specific local application for grid capacity has been made, taking up to 90 days. It is essential to partner with an experienced electrical designer that knows the DNOs and will be able to assess the opportunity in advance of an application.

2. Rights acquisition

Once a site has planning approval, grid accreditation and the rights to the land are secure, there are opportunities for investors to acquire the site shovel-ready. These would typically be organisations looking to hold the asset until its sale to an institutional fund, and the cost would be cheaper than buying once complete. The buyer could finance the construction on their own, via banks or work with one of the few EPC partners with its own finance. The latter approach can be useful, as the EPC will take on the risks of construction.

3. Project or construction finance

Once again, project or construction finance in solar is similar to wider construction projects in the UK. EPCs or developers tend to be looking for project or construction finance ranging from three to twelve months on projects with no income - a long time without any opportunity to refinance.
For a time, technology suppliers such as the Chinese solar panel manufacturers provided low-cost capital, but since their domestic market has picked up, this source has fallen away.

The manufacturers have been replaced mainly by the big banks, from which the costs of capital remain stubbornly high compared with Germany, at approximately 12-15% per annum. This is explained both by the relatively low exposure of short-term lenders to solar farm projects in the UK, but presents opportunities for investors. A small number of EPCs with strong balance sheets - such as Conergy - can finance builds, saving time and reducing the risk for developers.

"Pension funds, eyeing up assets with profit and loss accounts of two to three years, are thus far not acquiring newly built projects. This may change as institutional investors build a track record in portfolios of successfully managed assets."

Good construction is a major opportunity for investors. Free-field sites are not all alike, and the layout of panels and avoidance of shading from trees can make a significant difference to yields. Further, a well-designed scheme will provide an investor with less system losses and can optimise the plant to local conditions – again, improving the yield.

A strong EPC partner can also reduce risks, principally with regard to delays. If the contractor does not build the plant as designed and falls foul of the planning consent, remedial work can cost millions. Construction delays can be unpredictable. Builders might unexpectedly come across a gas pipeline, or the grid company might not agree to energise a site in mid-winter due to the risks of disruption to local residents. A strong EPC can offer protection, for example, in the case of Conergy, through its partnership with international accreditation agency TUV Rheinland, or by providing financial strength if there is an issue with a supplier.

Risks related to health and safety are less pronounced with solar farms than many investors believe. Solar panels are energised whenever it is sunny, and direct current can kill, sometimes hours after an electrocution has taken place. However due to the requirements of the DNOs, the protection, earthing and quality of kit makes panels exceptionally safe. If there is a fault, a good plant design will ensure immediate isolation.

4. Sale

The buyers of newly-built solar plants in the UK number about twenty five European or American investment companies building portfolios of solar or renewable energy assets, ranging from smaller investors with approximately £100m in capital to larger institutional funds. Each has its own acquisition strategy, with some preferring larger projects, which are simpler to manage and reduce transaction costs, and others viewing 5MW projects as more attractive, with risk spread across a larger portfolio and protection against the uncertainty of the new Contract for Difference (CfD) subsidy.

Pension funds, eyeing up assets with profit and loss accounts of two to three years, are thus far not acquiring newly built projects. This may change as institutional investors build a track record in portfolios of successfully managed assets. Certainly, developers are participating in projects earlier and investors are taking on more development and construction risk as the market matures. There are however countervailing trends with greater risk associated over the future value of ROCs.

The price paid for a solar plant is typically linked to the project’s IRR, similar to a yield model, with plant variables including grid, irradiation, shading losses, land lease, quality of build and tax efficiency. It is important to note that larger plants do not necessarily reduce overall costs. Modules account for around 44% of a typical project’s cost, but there is only a small degree of scalability after an EU court ruling on minimum import prices for Chinese panels. On the construction side, there are few gains in efficiency since more megawatts requires a consistent level of material and human resource.

Typically, buyers will acquire projects close to operation or already complete, with the timing of the deal reflecting the size of the site and the buyer’s risk profile. Most smaller
projects are sold immediately after energisation and accreditation with the UK energy regulator OFGEM, when the plant is already generating income. With larger projects, many buyers request a period of technical and legal due diligence before completion, modeling yields based on the first three to five months of operation. In general EPCs will take on some of the liability until energisation, will not be paid in full until after provisional accreditation (PAC) and will guarantee projects until full accreditation (FAR), usually two years after completion. Manufacturers of the solar panels, inverters, mounting systems and other technology most often provide guarantees for their technologies for as long as 25 years.

A strong operations and maintenance (O&M) partner can quickly address yield losses from faulty panels or unexpected shading. It is usually best to provide the O&M contract to the EPC, since they will have designed the site and know it best, and typically guarantee plant performance for a two-year period following full accreditation (FAC).

5. Refinancing

While investors are increasingly holding solar assets for twenty-five years – five years longer than ROCs are available – in the past there have been examples of the relatively fast resale of sites to funds seeking long-term income. “Flipping” sites can yield substantial and quick returns, of around £150m on a 100MW portfolio.

The solar farm build timetable

One of the attractions of solar is the speed with which it can be deployed, one of the causes for the swift about-turns on incentive structures set up by the UK government, as demand has beaten all expectations. When incentives account for around a third of revenues, regulated change significantly impacts decision-making on investment and exit strategies in all energy markets, here as elsewhere in the world.

There are two distinct opportunities for participating in the UK utility-scale solar boom: from now until the end of March 2015, when there are still opportunities to secure 5MW-plus projects that complete with the ROCs. Following this, the majority of new utility-scale plants will be funded by CfDs for projects over 5MW and feed-in-tariffs (FiTs) for those below. Subject to a government consultation underway at the time of writing, projects in Northern Ireland and community-owned projects of up to 10MW in the rest of the UK are expected to continue to receive support from the ROCs. This creates complexity, if not uncertainty, in the medium-term investment market.

Opportunities through March 2015

The speed of the solar business is one of its unexpected characteristics. Rapid acceleration of installations of PV on homes under the 2011/2 feed-in-tariffs (FiTs), and then the boom in utility-scale plants caught the British government, the utilities and the DNOs by surprise, leading to sudden about-turns on both incentive schemes. Investors looking to participate have to move quickly in Europe’s largest, most competitive solar market.

The rise to dominance of utility-scale projects did not begin in earnest until the subsidies fell from their original 2.0 ROCs to 1.6 ROCs in April 2013. The rewards on offer had taken some time to become widely known and for financing to be raised, and many companies delayed investment decisions until late in 2012.

The deadline for the reduction to 1.4 ROCs in March this year triggered a massive increase in installations, with over 16GW of new capacity constructed in quarter one. A large number of projects were hit by widespread flooding caused by one of the wettest winters the UK has ever seen, leaving some to fail to connect on time. In these cases EPC contractors were liable for at least some of the losses of investors.

We will never know how 1.3 ROCs would have impacted the market, as ROC funding for projects over 5MW is almost certain to be removed at the end of March 2015. With huge pressure to complete builds through to quarter one, few EPCs this time round are expected to avoid starting builds in January 2015. That means few will take on projects that are not already in planning at the time of writing, or that lack an expected date of approval. EPCs will also be particularly selective with sites larger than 20MW, since they are more logistically challenging to build.

The best solution for developers and investors is to push strongly for large builds to take place this summer and autumn, and to ensure they have an EPC that can scale up to demand, protect against construction risk, and has the capacity to deliver.

What we know about CfDs

The solar industry has a habit of vocally attacking the government when there are changes to the incentive structures. When the news came that solar would be moving to CfDs in April 2015, ahead of onshore wind, there were howls of protest.

At the time of writing, a consultation on the transition to CfDs is underway, but there is enough clarity that market participants should not be displeased with an end to
ROCs at 5MW-plus. CfDs are certainly proving sufficient attractions to foreign investors to fund the huge costs of new nuclear build, and adjusting ahead of onshore wind to the new regime may yield competitive advantage for the solar industry going forward.

On paper, CfDs are more attractive to investors than ROCs, where we have sometimes seen considerable price fluctuations, depending on levels of renewable energy generation. Fixed generation-based tariffs offer greater certainty to investors, as with the FiTs.

The structure of the scheme will be key. We will know in October what the size of the auctions will be, and their timing. Conergy would certainly welcome monthly auctions, which would suit solar because of its relatively fast deployment.

**Impacts on the transition phase, January-March 2015**

Projects that fail to connect on time in March will become the first to enter into the Contracts for Difference (CfD) auctions. At present the lack of detail on the structure creates challenges for investors. Until information becomes available in October, one option would be to set several hares running, with a limited number of mid-scale projects in development and a significant number of 5MW projects.

If significant funds are made available through the CfDs for onshore wind and solar in October, investors may be more disposed to funding 5MW-plus projects through the transition phase, with the expectation that similar funding would be forthcoming from the CfDs. If funds are lower than expected, many projects in the 6-8MW category will downsize to 5MW so that they can still take advantage of FiT certainty in the case of delays.

**Conclusion: future UK solar farm deployment and the realities of risk management**

The pace with which the finance, legal and construction sectors in the UK have responded to regulatory signals has contributed to one of the fastest deployments of new solar capacity anywhere in the world. The unique characteristics of PV – a simple, reliable technology – mean Conergy expects this to continue, supported by innovations in for example, energy storage.

There are however major systemic challenges to solar encroaching further on the turf of traditional power generation. The falling technology prices that helped make the sector competitive may not be repeatable, and grid capacity is increasingly scarce. More restrictive planning is shifting development towards brownfield sites, while the cost of land has remained static despite the falling value of ROCs. Communities, encouraged by government, are meanwhile increasingly demanding a share of the revenues of new plants.

These trends are as unpredictable for the industry as they are for the utilities and government. The most obvious transformational opportunity then will come not from tinkering with incentives or planning laws, or indulging in politics, but from the private sector re-appraising its approach to risk.

The reality is that very few solar farm projects in the UK have actually failed. Conergy itself is comfortable with financing builds and holding assets in the medium-term. Finance for UK solar farm developments is certain to become more competitive. As the market matures, solar’s risk/reward profile will fall into line with utility-scale solar in Germany, and indeed other infrastructure projects in Great Britain. For investors with the appetite, that means the greatest opportunity for investors in UK solar is right now.

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Conergy is one of the world’s largest downstream solar companies, specialising in the design, finance, build and operation of high performance solar systems for homes, businesses and utility-scale power. Founded in 1998, the company pioneered the expansion of solar power internationally, and today combines innovative technology, industry-leading engineering with access to capital. Headquartered in Hamburg, Germany, Conergy has a global sales network and established subsidiaries in 11 countries. The company is privately-held and majority-owned by Miami-based asset management firm Kawa Capital Management, Inc.

Conergy UK & Ireland, based in Milton Keynes, has worked on some of Britain’s most pioneering projects, including the UK’s first large scale solar farm (5MW) and a wave-shaped rooftop installation at Nationwide Building Society headquarters.
The end of an era... and the start of a new investment landscape under Contract for Difference

In the 12 months since the release of last year’s UK Green Investment Guide, the UK investment landscape has undergone significant change. Solar PV has emerged as the dominant renewable energy technology and is being deployed at a scale not seen before in the UK. It is estimated a record 1.45 GW of new ground mounted solar capacity was built in 2013, with large-scale installations growing by a staggering 600%. The growth has continued in 1Q14, when an estimated 1.1 GW of new capacity was brought online.

Neas Energy has supported the rapid development of this sector by offering a range of offtake agreements structured to meet asset owners’ requirements. In total, we have contracted 250 MW of solar assets under management. Our UK subsidiary has reached a double-digit percentile market share after opening in the beginning of 2013. This has been coupled with continued strong growth by our parent company, Neas Energy A/S.

However, the Government has recently acted to control solar deployment, as the growth rate could lead to budget overspending under the current regulatory regime. With the release of the “Changes to the Financial Support for Solar PV” consultation, DECC made clear that the current build-out rate of solar PV under the Renewable Obligation could limit the government’s overall renewable objectives for 2020. Consequently the RO scheme will be closed for all new solar projects above 5 MW from April 2015.

This is the biggest change to the solar industry since the introduction of the RO scheme. Whilst this has impacted many companies’ long term development plans, there is a viable alternative in the form of the ‘Contract for Difference’ (CfD) regime, which will have its first allocation round later this year for projects starting in April 2015 and beyond. This could mitigate an investment deceleration and, in some ways, may even prove more attractive as it provides more stable returns over the term of the government support.

Because the CfD is designed to protect investors from decreases in revenue income when power prices fall, it also limits upside for investors when power prices rise. Therefore, the new regime could discourage interest from more entrepreneurial investors.

The main difference between the RO scheme and the CfD regime is the monetary value of the support scheme. Under the RO scheme, the monetary value of support is fixed and
Though leadership

Neas Energy Ltd.

increases the variable return from the sale of electricity. Thus, the sum of revenues from electricity and RO-support is variable. Under the CfD, the support is a variable amount that makes up the difference between the strike price and the variable return from the sales of electricity, essentially making the sum stable (See Figure 1).

The stable income for renewable generation opens up new possibilities for financing and investment. Returns from investment under the CfD regime will become more predictable as the income per MWh is foreseeable for the whole term of the CfD. Inevitably, the predictability of income will lead to increased interest for renewable assets with more risk-averse investors. In combination with a Power Purchase Agreement (PPA) designed to give investor certainty, “bond-like” investment returns might be achievable for a 15-year term.

The stability will however decrease the perceived upside potential that the current renewable obligation scheme offers. Because the CfD is designed to protect investors from decreases in revenue income when power prices fall, it also limits upside for investors when power prices rise. Therefore, the new regime could discourage interest from more entrepreneurial investors. It is anticipated that the current investors will adjust their risk/reward profile to anticipate the loss of upside potential.

To conclude, we believe that the end of the RO regime will not herald the end of renewable energy investment in the UK. Instead, it will likely entice a new wave of investors into the UK’s renewable energy sector. These investors will bring new investment strategies, financing models and innovative capitalisation and securitisation approaches. With this new capital, the renewable energy market is destined to grow even further in the coming years.

Neas Energy Ltd

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Neas Energy aims to find the right solutions to meet our Generators requirements and would welcome the opportunity to tailor this proposition to meet your specification.

Neas Energy is a well-established and respected Power Purchase Agreement (PPA) provider in Europe, operating since 1998 from our base in Aalborg, Denmark. The aim of our PPAs is to provide a competitive but simplified route to market for UK generators.

The business focus is always to seek to ‘Maximise Value and Minimise Risks’ for all counterparties involved in PPA arrangements. Importantly we are an independent energy supplier, who does not seek to own assets, enabling us to focus on working with you long term to ensure you maximise value from your generation assets within the changing UK energy market.

Neas Energy Ltd has contracted renewable projects for 15 year, long term off take agreements, but also short term PPAs of 6 months. Currently Neas Energy Ltd has contracted capacity of over 300 MW in the UK. We expect this to increase significantly by the end of 2014.
Expert asset management maximises onshore wind production

Onshore wind is a cornerstone of the UK renewable energy sector, with approximately 6 GW installed as of the end of 2013 and about 7 GW under construction or approved with planning permission. As subsidy rates fall and new institutional investors enter the sector, it is more essential than ever that energy production is maximised across the lifespan of a wind farm.

To achieve this, wind farms must be monitored and maintained by experienced asset managers that can utilise the wealth of knowledge they have already accumulated in the sector to identify and address problems with wind assets before they can seriously threaten production.

Institutional investors need educated asset management

Expert third-party asset management has become an increasing priority for onshore wind farms due to the ongoing transition in project ownership from utilities to institutional investors such as YieldCos and infrastructure funds.

Because institutional investors are smart procurers they are rightly going to demand a level of service that is hard to find in the market at the moment. It is found predominantly in the organisations that have been operating assets and gathering data for a long period of time.

While utilities usually maintained their own asset management operations, institutional investors require external expertise to fully ensure the smooth and efficient long-term performance of renewable energy assets.

Even investors with experience of managing assets such as large infrastructure and PFI assets will still find it challenging to manage wind farms, which represent another level of complexity and require genuine multi-discipline expertise to monitor and maintain.

Intensive asset performance monitoring is vital

The ideal asset management solution utilises 24/7/365 monitoring and maximises the use of information from wind farms, including data from Condition Monitoring Systems (CMS) and Supervisory Control and Data Acquisition (SCADA), to maximise profitability and asset value.

Through reliability engineering techniques, an asset manager can optimise the performance of a wind farm with far more detailed and forensic analysis than that often provided by original equipment manufacturers (OEMs).

Important production-related issues can go unnoticed by the OEM. Examples include incorrectly applied site-specific turbine settings and lost production due to component issues that do not reach thresholds to trigger alarms.

An asset manager will also ensure that an asset remains compliant with important contractual regulations. Failure to comply with grid regulation can result in a project being switched off, which would greatly impact asset yield. Compliance with planning regulations governing noise and shade inconvenience must also be continually monitored.
Prevention and optimisation of maintenance maximises production

An effective asset manager can identify issues early so that they are dealt with in the most cost-effective manner. For example, if CMS identify a problematic component, the asset manager can conduct preventative maintenance before failure rather than simply replace the equipment when it malfunctions. This is less costly in terms of components, logistics and reduced downtime for maintenance.

Intelligent monitoring identifies the issue early and allows the asset manager to turn-off or allow operation of the turbine under load-optimised conditions before repairs can be implemented at a time least damaging to annual production, such as during the summer, or at a time when critical equipment is known to be readily available. In addition, an understanding of failure progression provides the confidence to continue operating the turbine with a known defect, eliminating unnecessary intervention to physically check progression. Issues across multiple turbines at a given site can also be grouped together to ensure they are dealt with simultaneously, again minimising production downtime and cost.

Q&A: Jamie Scurlock, Head of Turbine Engineering at RES

QUESTION: Why monitor a wind farm?

ANSWER: Without monitoring, owners are blind to potential risks. They could face fines or a disconnection notice for grid non-compliance or failure to adhere to noise conditions. However, operating outside of parameters is not the only risk. Running major components to failure is hugely costly. In a recent case, preventative maintenance on a turbine gearbox cost £70,000. Had it failed, RES estimated the repairs at £165,000.

QUESTION: Surely the OEM provides this service?

ANSWER: In part, they do. However, their monitoring is usually restricted to warnings and alarms that affect availability guarantees. Poor performance, incorrect curtailment or grid compliance is not normally covered. OEMs focus on fleet effects, not project or turbine specific issues. To give an example, routine monitoring on a RES managed site identified an error in the park controller which meant that turbines were being unnecessarily curtailed by up to 4%. RES notified the OEM, who investigated and corrected the issue.

QUESTION: Are there cases where upgrading or servicing has adversely affected yield?

ANSWER: Yes. After a software upgrade, site-specific settings were lost from a controller which led to significant lost production. Undetected, this could have quickly led to thousands of pounds in lost revenue. At another site, following a service, incorrect noise curtailment parameters were applied because the turbine supply agreement was misinterpreted. Although it was complex to identify the error from the data, detailed analysis identified it and the situation was rectified. Unnoticed, the unnecessary curtailment would have cost the wind farm owner £200,000 per year, potentially for the life of the wind farm.

QUESTION: What is the payback period for adopting monitoring?

ANSWER: Retrofitting condition monitoring systems to a fleet of 66 turbines had a component payback period of 18 months. This was achieved by identifying problems early, reducing cost of repairs and minimising downtime. Savings will continue to be accrued during the remaining 15 years of operation on these managed wind farms.

RES (Renewable Energy Systems Ltd.)

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RES is one of the world’s leading renewable energy companies, with extensive experience in developing, engineering, financing, constructing and operating utility-scale infrastructure projects across a wide range of low carbon technologies including wind, solar, marine, thermal, storage, transmission and demand-side management. RES has developed and/or constructed more than 140 projects globally, with a combined capacity of over 8GW.

RES’ large onshore asset management portfolio exceeds 1.3GW of installed capacity, approximately 850MW of which is based in the UK, Ireland, France and Sweden. Assets under management are either owned by RES or by institutional investors who benefit from RES’ 20 years of asset management experience, in-house IP and technical expertise.

RES asset management services include:

- Preventative maintenance: early warning of potential failure and timely action to resolve issues
- Compliance monitoring: with grid agreements and planning conditions
- Root cause investigation: assistance in the technical aspects of warranty claims
- Bespoke assessments: investigating technical risk and commercial benefit of technology upgrades and retrofits
- End of warranty health checks: in-depth and cost effective surveys before technical warranties expire

Institutional investors deserve high performance operational management, expert monitoring and innovative reliability engineering. RES delivers this comprehensive, competitive and independent range of services, tailored to its clients’ needs.
QUESTION: Can you provide an overview of Aviva Investors and your investment strategy in renewable energy?

ANSWER: Aviva Investors manages capital for third parties as well as Aviva. Third parties tend to be insurance companies or pension funds that want long-term, stable income streams in one form or another. The only exception is the UK Green Investment Bank, which is also an investor in our fund. Within infrastructure we have a keen interest in renewable energy and have built up a strong investment team during the past five years.

We have two long-term investment strategies. One is an asset owning strategy and the other is a debt strategy. Typically our asset owning strategy does not utilise leverage. We consider ourselves quite innovative in terms of how we try to finance or acquire assets and try to work closely with partners. Investing in renewable energy has become more normal for a growing number of investors, which is why we have to be a bit more creative when it comes to driving returns.

We aim to own our assets for the long term and don’t take any refinancing or private equity type risks that many others do. We have mostly invested in operating assets but that is certainly not a requirement. It is relatively quick to build a renewable energy asset. We are happy to invest pre-construction if it can be structured to the extent we are not bearing many risks.

We have made a number of renewable energy investments as part of both of these strategies, although they are perhaps less mainstream than what you might expect. This is in part deliberate because we believe we can access and structure investment opportunities in a better way than the market has done generally.
QUESTION: Which renewable energy technologies is Aviva Investors targeting?

ANSWER: We have invested in conventional wind and solar farms and also some non-conventional solar assets such as residential solar. As part of our asset owning strategy, we are very interested in developing ways for institutional clients to invest in sectors that are not yet institutionalised.

Our strategy in UK solar is a good example of this. Our first deal, which was around two years ago now, was for a portfolio of residential solar assets. It is relatively straightforward to acquire six wind turbines in a field, but much more complex to buy 6,000 domestic solar installations. We are willing to investigate these sorts of opportunities and institutionalise these markets where sensible.

QUESTION: To what extent are you targeting investments in less mainstream renewable energy technologies?

ANSWER: We have invested in combined heat and power installations under the umbrella of energy efficiency, some of which use biomass feedstock. We don’t have an aversion to biomass but these deals are not easy to do. But we certainly would invest in biomass if we found the right deal. We would draw the line at wave and tidal though as there is not enough deal volume let alone any demonstrable technology. Offshore wind might be something we get involved with in the future.

QUESTION: Which countries across Europe are you currently focusing on? Are there any countries that should be avoided?

ANSWER: We just invest in core Europe including the UK. We see uncertainty in southern Europe getting worse rather than better due to retroactive changes. Spain hasn’t made any progress in two years in dealing with retroactive changes and who knows quite what is happening in Italy at the moment. It is clear to everyone that investing in southern Europe involves a degree of regulatory risk. This doesn’t mean there are no investment opportunities but it does mean there are less new assets being built.

QUESTION: How is the transition towards the CfD mechanism in the UK impacting the way you evaluate renewable energy investment opportunities?

ANSWER: To a certain extent we pay little attention to this debate at the moment. I am sure it will work in the end and at some point we will buy some assets subsidised under it. But we are deliberately not at the forefront of trying to make the first CfD deal work. Why would we? We have engaged with the government and are confident it will provide an investible regime once it is finalised, although this stage has not yet been reached.

Aviva Investors provides asset management services to institutional investors. We operate around the world, employing more than 950 employees in 15 countries. Our total assets under management were £241 billion (as at 31 December 2013) and our clients include pension funds, sovereign wealth funds, insurance companies, national and local government bodies, wealth managers, charities and corporate investors.

The infrastructure team, part of the Secure Income Alternatives unit of Aviva Investors, provides finance for debt and equity projects. We manage a range of strategies including the Aviva Investors Return Enhancing and Liability Matching (REaLM) Infrastructure Fund. Through this strategy we acquire assets without the complication and risks associated with leverage and look to provide our institutional investors with long term, secure cashflows ideal for matching future liabilities.

The Infrastructure team manages c. £1,800m and invests across a range of infrastructure sectors with particular expertise in renewables and energy efficiency.
Investment appetite to survive CfD transition

Adiant Capital Partners is an investment manager founded by two former Goldman Sachs Principal Investment Area professionals in 2011 that focuses on infrastructure investments in the renewable energy sector. The firm delivered the first European construction capital fund, Adiant Solar Opportunities, bridging the gap between long-term hold investors seeking de-risked cash flows, cash-strapped developers and construction companies with insufficient capital to build on balance sheet.

Unlike many other renewable energy infrastructure funds, Adiant Capital’s latest fund seeks to enhance returns by investing in the construction phase, repowering and acquiring operating assets from distressed sellers or banks having taken control of over-levered assets after covenant breaches and wishing to exit. The Adiant Renewables Opportunities Fund, a €250 million target fund, invests in a diversified portfolio of renewable energy and infrastructure assets primarily in wind and PV opportunities, as well as other renewables.

**QUESTION:** Is there still a strong appetite to invest in the UK despite the transition to Contracts for Difference?

**MANAGING PARTNER NILS HAMMON:** The UK market will remain effective but clearly one could not achieve such high returns because there are several elements of uncertainty. One of them is the recycle price on the Renewables Obligation Certificates; second is the PPA pricing; and third is inflation. All these elements created inherent volatility. A lot of that will be taken out once CFs come in and I expect that the market will not come to a halt. It will simply mean investors take home a smaller return than they used to. It will fall into the typical 6-7% bucket, a level at which most people invest outside of the UK.

**MANAGING PARTNER PIERRE-LOIC CAIJO:** With CFs you will have more stability in revenue expectations over a long period of time, so that will attract ‘lower cost of capital’ investors such as pension funds and insurance companies.

That could be counterbalanced by the fact solar will be competing head to head with wind. It might be tricky for solar to compete on a level playing field. The market will become orientated towards small installations and rooftops, as elsewhere in Europe and in the US. In a sense, the market is being normalised and there should be continuous interest from investors for commercial or residential portfolios of solar projects.

“We are in preparation of our third fund, which is a global long hold fund, after having delivered highly attractive returns with our construction capital fund. The new fund will deliver de-risked, long-term cash flows to investors.”
QUESTION: Will we see a rush to complete and invest in solar projects before the Renewables Obligation ends?

HAMMON: There is definitely a rush at the moment because everyone is struggling to complete their projects under the 1.4 ROCs regime before March 31, 2015. With CfDs coming in now and the ROCs falling away above 5 MWp next year, what we will see is a bit of a slow-down in development, especially on the PV side. We’ve seen installations of 2 GWp or so and that’s clearly a massive rush by developers before the market comes to an end.

We have a number of clients looking for secure, long-term interests struggling to get their capital deployed as soon as possible. Whether there be the same rush past 31 March next year, it’s difficult to say at this stage. I think there will be a demand from different types of investors. Typically they will be looking for lower returns but will have to get used to the highly fragmented approach.

Clearly, the market will remain attractive, but on a different scale. So it could be that we need to acquire five 5 MWp photovoltaic projects to make an investment of €30 million. Alternatively, we will acquire operating assets out of funds that will be selling. We are also looking to acquire wind assets.

QUESTION: Will we see more activity in the secondary market in the UK as a result of fund exits?

HAMMON: To a certain extent, yes. The UK market is relatively new still and what we’ve seen is refinancing like the Foresight Solar Bond. EIS funds, which usually have to exit within three to five years, will come to market after having invested their capital. They were trying to cash out when the lower return expectations were coming in. New regulations will to a certain extent lead to less flow of capital in that sector. There will be less inflow from very low-cost capital, so it could work in our favour.

The EIS schemes will not invest new capital because they are constrained, but they can recapitalise existing investments by taking out a bond that can be invested; or they simply sell the equity altogether and repay their investors, and then don’t invest at all in new projects.

QUESTION: What other opportunities do you anticipate?

CAIJO: In addition to buying operating assets or those under construction, we are also looking to buy distressed assets or operating assets from distressed sellers. These could either be distressed EPCs or developers that see margins shrinking and have an IPP portfolio they’re trying to sell off, or big banks that have taken equity on their books effectively. Sometimes a group of private individuals took 100% financing but failed to repay debt and gave the keys to the bank, which isn’t really in the business of owning renewable assets.

Overall, we are pursuing a de-risked strategy where at the core we buy operating assets for long-term cash flows, but where we increase the yield opportunistically, through either construction and financial or operational restructuring. Our aim is to deliver an attractive fixed yield to investors.

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Adiant Capital Partners is an investment management firm specialising in renewable energy infrastructure and related investments. We invest globally across the renewable energy industry, in private equity, and in distressed debt, and has invested and advised on transactions worth over €50 billion in value.

Adiant Renewables Opportunities Fund

Asset Allocation Target

- Wind: 50%
- Solar PV: 33%
- Other renewables: 17%

€250 Million Target

€250 Million target
March 2014 saw the launch of NextEnergy Solar Fund Limited as a Guernsey domiciled closed-ended collective investment fund focusing on operational solar photovoltaic assets located in the UK. The investment fund successfully raised £86 million for its listing on the premium segment of the main market of the London Stock Exchange (LSE).

This was followed in April by the John Laing Environmental Assets Group Limited raising proceeds of £160 million for its own placing and Initial Public Offering (IPO) on the LSE. It is also a Guernsey domiciled closed-ended fund which will acquire a seed portfolio of interests in UK based solar, onshore wind, waste processing and wastewater projects on or around admission.

These two launches also come in the wake of a number of successful launches during 2013 of other Guernsey domiciled investment funds: Resonance British Wind Energy Income Fund first closed in April 2013 with £35 million for consolidating the small and medium sized operating wind farm industry in the UK; in July 2013 Bluefield Solar Income Fund had an initial capital raising of £130 million on the premium segment of the LSE as the first solar energy infrastructure fund focused on the acquisition and management of a diversified portfolio of large scale solar energy in the UK; and later that same month, The Renewables Infrastructure Group – investing in a portfolio of fully operational wind and solar energy generation assets – raised £300 million on the LSE, with City sources reporting that this was the largest IPO of a clean energy firm in London to date.

These examples are part of the growing body of evidence which suggests Guernsey is seen as the home of the clean energy fund and especially for those seeking to IPO.
**Investment fund credentials**

Guernsey’s long and strong heritage as an investment fund centre has helped build an industry with significant infrastructure and expertise. Today, there are more than 50 fund managers, administrators and custodians servicing more than 1,000 investment funds valued at approximately half a trillion US dollars. Guernsey domiciled investment funds are distributed into all corners of the globe.

The Island is well positioned for the domiciling and servicing of the widest range of funds but it has grown a reputation for excellence in alternative investments, especially private equity, property and infrastructure and, more recently, clean energy. This experience means that Guernsey is ideally placed to act as a centre for funds investing in existing clean energy projects or seeking to raise finance for new clean energy ventures.

Leading global investment houses, including those within the clean energy space, have their funds domiciled and serviced in Guernsey and a number have also established staffed offices in the Island.

Guernsey has a pool of well-qualified non-executive directors, many of whom have broad industry experience as well as specific clean energy experience. Many of the major investors, including those who specialise in clean energy, are therefore comfortable with Guernsey as a fund domicile.

Guernsey’s regulator has significant experience of understanding investment fund structures and last year approved 103 new funds across a range of different asset classes including a number of clean energy vehicles. Much of this success can be attributed to the fact that as the Island is outside the EU, it is able to provide a flexible and proportionate regulatory regime.

Guernsey is tax neutral for investment funds which means that tax is only paid by investors in their home country and according to their own circumstances.

The desired fund structure for any clean energy project will often be dictated by the requirements of the investors but consideration should also be given to whether the structure will remain optimal as the project proceeds and indeed, the most appropriate exit strategy should be established at the outset of the venture.

**Listed funds**

The ability to float companies on international exchanges may prove beneficial to a clean energy fund since a stock market launch may provide early investors with an exit route from the project as well as provide access to further capital investment.

Guernsey companies can list on the LSE, Euronext, Hong Kong, Toronto, Australia as well as the local Channel Islands Securities Exchange (CISE), amongst many others. A number of Guernsey clean energy vehicles have been utilised to access various stock exchanges and most notably the LSE where data shows that there are more Guernsey entities listed on its markets than there are vehicles from any other jurisdiction globally (ex UK). There are currently 125 Guernsey investment funds and trading companies listed on the LSE with a combined market capitalisation of £34 billion.

**Conclusion**

Guernsey has a broad finance industry which can provide a wide range of financial services to clean energy projects, including banking services, specialist insurance and bespoke intellectual property protection. However, the Island has found its niche as a centre for clean energy investment funds and especially those seeking to raise capital through a listing on an international stock exchange. Guernsey is the home of the listed clean energy fund.

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Offshore wind project cost outlook

In April 2014, Clean Energy Pipeline and PD Ports released ‘Offshore Wind Project Cost Outlook – 2014 edition’. Based on a survey of over 200 senior executives in the European offshore wind industry, this report analyses the potential for cost reductions and efficiencies in the offshore wind supply chain in Europe. It examines the areas of the supply chain where the most significant cost savings may be achievable and what might underpin cost reductions. The following pages summarise the findings of the report.

The offshore wind industry is confident that significant cost reductions are achievable across the supply chain during the next ten years. On average, the 200 executives in the European offshore wind industry surveyed for this report expect the cost of developing and constructing offshore wind farms to fall to £2.8 million per MW for projects that reach a final investment decision (FID) in 2018 and to £2.4 million per MW for projects that reach a FID in 2023. This represents a 10% and 23% decrease respectively on the £3.1 million per MW cost at the beginning of 2014.

This is encouraging news for the industry. In the past six months some of Europe’s largest utilities, including SSE, RWE and Iberdrola, have announced significant cuts to the size of planned offshore wind farms and even cancelled some projects entirely, in part due to concerns over costs. Realising cost efficiencies across the entire supply chain, from component manufacturing to equipment installation, will be essential to encourage continued investment in offshore wind.

The survey data points to three specific areas of the supply chain where cost reductions are most likely to be realised – equipment installation, foundation manufacture and turbine tower production. The cost of these processes are expected to fall by 6.6%, 6.1% and 5.4% respectively in the next five years.

The survey also questioned the industry on its expectations regarding reductions in the levilised cost of offshore wind energy, which measures projects’ lifetime costs. On average, respondents expect the offshore wind LCOE to decrease to £123 per MWh for projects that reach a FID in 2018 and £111 per MWh for projects that reach a FID in 2023, a significant decrease on the £133 per MWh current cost. If these predictions are accurate, the industry will not achieve the UK Government’s target, set in 2011, for offshore wind costs to decline to £100 per MWh by 2020.

Survey respondents clearly identified economies of scale, higher capacity turbines and technology innovation as the
most important drivers of cost reductions. In fact, survey respondents cited economies of scale as the driver most likely to reduce costs for the three most capital intensive areas of the offshore wind supply chain – installation, foundations and turbines.

In addition, 70% of survey respondents believe geographic concentration of the supply chain can reduce offshore wind costs. Survey respondents judge the Northeast Coast of the UK as the prime location for offshore wind manufacturing capacity, followed by Scotland.

However, nearly all survey respondents and industry experts interviewed for this report added the qualifier that significant cost reductions are only achievable if governments across Europe adopt stable and adequate incentive mechanisms that provide developers and the supply chain with the certainty needed to invest. Indeed, seven out of ten survey respondents stated the best thing governments can do to encourage investment in offshore wind technology innovation is to create a stable subsidy environment.

Opinion is divided as to whether this certainty is currently present. On the one hand, the UK Government’s finalisation in December 2013 of the strike price that UK projects subsidised under the contract-for-difference (CFD) feed in tariff will receive provides certainty on the revenue line. This was crucial in Siemens committing to a major £160 million investment in two turbine manufacturing facilities in the UK in March 2014. However there are still ongoing concerns about the delivery mechanism for CFD contracts, not to mention the UK Government’s long term commitment to offshore wind in light of vocal support for nuclear energy and fracking.

A Clean Energy Pipeline guide to:

The Renewable Heat Incentive

Sponsored by Aratus Capital

This article provides an overview of the UK’s Renewable Heat Incentive (“RHI”). It discusses its purpose, the technologies covered, the subsidies available and recent changes to the incentive mechanism itself.

What is the Renewable Heat Incentive?

The RHI is a financial support programme for renewable heat designed to bridge the gap between the cost of fossil fuel heat installations and more expensive renewable alternatives. It is part of a suite of policies and incentive mechanisms designed to assist the UK meet its renewable energy and carbon reduction targets. These targets include: meeting 15% of the UK’s energy demand from renewable sources by 2020; generating 12% of heating demand from renewable sources by 2020; and reducing CO2 emissions by 80% from 1990 levels by 2050.

Tackling heat is vital if the UK is going to meet these targets – some 47% of UK energy consumption is for heating purposes and £32 billion is spent on heating annually. Furthermore, approximately one third of the UK’s carbon emissions are generated directly from heating.

When details of the scheme were first unveiled in March 2011, the government forecast it would drive £4.5 billion investment in renewable heat in the ensuing decade and that it would support 13,000 industrial and 110,000 commercial and public renewable heat installations by 2020. Thus far only c.4,000 projects have applied for the scheme, which is why the government made amendments to the scheme in March 2014.

The RHI has two strands:

- **Non-domestic RHI**, which subsidises renewable heat produced by businesses, industry and public sector organisations. This was launched in November 2011.

- **Domestic RHI**, which provides subsidies to heat produced by homeowners and landlords. This was launched in April 2014.
Investors should note that companies benefitting from the RHI will not qualify for EIS, SEIS, or VCT investment in the near future. This restriction was announced in the Budget in March 2014 and will come into effect from the date of Royal Assent of the 2014 Finance Bill in July 2014.

Non-domestic RHI

The non-domestic RHI covers the following five technologies:

- biomass
- heat pumps
- geothermal
- solar thermal
- bioenergy (biomethane & biogas).

Applicable projects receive quarterly payments for 20 years, which are calculated based on the type of technology, the capacity of the project and the heat consumed. The subsidies available when the scheme was first launched are shown in the table below:

<table>
<thead>
<tr>
<th>TARIFF NAME</th>
<th>ELIGIBLE TECHNOLOGY</th>
<th>ELIGIBLE SIZES</th>
<th>TIER</th>
<th>CURRENT APPLICABLE TARIFFS</th>
<th>RPI ADJUSTED TARIFF FOR 1 APRIL 2014 (2.7%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small commercial biomass</td>
<td>Solid biomass including solid biomass contained in municipal solid waste and CHP</td>
<td>Less than 200 kW</td>
<td>Tier 1</td>
<td>8.6</td>
<td>8.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Tier 2</td>
<td>2.2</td>
<td>2.3</td>
</tr>
<tr>
<td>Medium commercial Biomass</td>
<td>Ground-source heat pumps; Water Source heat pumps; deep geothermal</td>
<td>Less than 100 kW</td>
<td>Tier 1</td>
<td>5.3</td>
<td>5.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>200 kW and above; less than 1MW</td>
<td>Tier 2</td>
<td>2.2</td>
<td>2.3</td>
</tr>
<tr>
<td>Medium commercial Biomass (w/e from 1 July 2013)</td>
<td>Ground-source heat pumps; Water Source heat pumps; deep geothermal</td>
<td>1MW and above</td>
<td>Tier 1</td>
<td>5</td>
<td>5.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Tier 2</td>
<td>2.1</td>
<td>2.2</td>
</tr>
<tr>
<td>Large commercial Biomass</td>
<td>Solar collectors</td>
<td>Less than 200 kW</td>
<td>N/A</td>
<td>4.8</td>
<td>4.9</td>
</tr>
<tr>
<td>Small commercial heat pumps</td>
<td></td>
<td>100 kW and above</td>
<td>N/A</td>
<td>3.5</td>
<td>3.6</td>
</tr>
<tr>
<td>Large commercial heat pumps</td>
<td></td>
<td>All solar collectors</td>
<td>N/A</td>
<td>9.2</td>
<td>9.4</td>
</tr>
<tr>
<td>All solar collectors</td>
<td></td>
<td></td>
<td>N/A</td>
<td>3</td>
<td>3.5</td>
</tr>
<tr>
<td>Biomethane and biogas combustion</td>
<td>Biomethane injection and biogas combustion</td>
<td>Less than 200 kW</td>
<td>N/A</td>
<td>7.3</td>
<td>7.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Biomethane all scales, biogas combustion less than 200 kW</td>
<td>N/A</td>
<td>3.5</td>
<td>3.6</td>
</tr>
</tbody>
</table>

Source: UK Government
The level of support is fixed and then adjusted annually in line with inflation. As with feed-in tariffs for renewable energy, the government reviews tariffs for new installations regularly to ensure they decrease in line with equipment and installation costs.

As of March 2014, over 4,000 applications for the non-domestic RHI had been received, the majority of which were for biomass boilers. To date the non-domestic RHI has generated the greatest interest from the agricultural sector, where biomass boilers for off-mains gas heat in poultry and horticulture applications dominate. More recently, a growing number of applications for biomethane injection-to-grid from Anaerobic Digestion plants have been submitted. Some case studies are outlined opposite.

However, the number of applications is well below government forecasts. Based on the number of applications, the government estimates that 1.2 TWh of heat will be generated in 2013/2014. This is just over a third of what was originally expected. With this in mind, the government introduced a series of amendments to the non-domestic RHI in May 2014 including:

- tariff changes;
- the inclusion of new technologies;
- different eligibility criteria; and
- biomass sustainability

The government hopes that these changes will incentivise an additional 5,000 installations and 6.4 TWh of renewable heat by the end of 2015/16. The main changes implemented in May are outlined below:

**Case study 1: Rainbarrow Farm Anaerobic Digester (AD) with biomethane injection**

The UK’s first AD biomethane to grid project was installed at Rainbarrow Farm, Dorset, in October 2012. It is subsidised through the RHI. The plant is owned by a joint venture between J V Farming, the Duchy of Cornwall and ABP Ltd. Feedstock includes 4,000 tonnes of potato waste, 26,000 tonnes of maize silage, 4,000 tonnes of grass silage and 7,000 tonnes of food waste.

The feedstock is digested in an anaerobic digester which produces biogas with 96% biomethane content. This is then upgraded and converted into biomethane before being injected into the grid as a substitute gas by Southern Gas Networks, who operate the Southern Region gas network. The project currently injects 400 cubic metres of gas into the local gas grid per hour.

**Case study 2: Northamptonshire poultry unit**

In December 2012 Rural Energy completed construction of a single 1 MW biomass wood-chip boiler at a poultry farm in Northamptonshire. The unit, which provides renewable heat for six poultry sheds, replaces fossil fuel heating systems, which used 150,000 litres of liquid petroleum gas (LPG) and 65,000 litres of oil per year, costing £150,000.

The biomass boilers enable immediate savings of £120,000 in fuel costs. In addition, the project receives £68,000 per year in RHI subsidies.

**Tariff changes:** The following technologies will see an increased tariff:

<table>
<thead>
<tr>
<th>TECHNOLOGY</th>
<th>CAPACITY</th>
<th>OLD TARIFF</th>
<th>NEW TARIFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground source heat pumps</td>
<td>Small GSHP less than 100kW</td>
<td>4.8p/kWh</td>
<td>Tier 1: 8.7p/kWh, Tier 2: 2.6p/kWh</td>
</tr>
<tr>
<td></td>
<td>Large GSHP of 100kW and above</td>
<td>3.5p/kWh</td>
<td>(All capacities of GSHPs)</td>
</tr>
<tr>
<td>Solar thermal collectors</td>
<td>Less than 200kW</td>
<td>9.2p/kWh</td>
<td>10p/kWh</td>
</tr>
<tr>
<td>Large biomass</td>
<td>1MW and above</td>
<td>1p/kWh</td>
<td>2p/kWh</td>
</tr>
</tbody>
</table>

Source: UK Government

**New applicable technologies:** Tariffs will be introduced for the following technologies:

<table>
<thead>
<tr>
<th>TECHNOLOGY</th>
<th>CAPACITY</th>
<th>NEW TARIFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air source heat pumps</td>
<td>All capacities</td>
<td>2.5p/kWh</td>
</tr>
<tr>
<td>New deep geothermal</td>
<td>All capacities</td>
<td>5p/kWh</td>
</tr>
<tr>
<td>New solid biomass CHP systems</td>
<td>All capacities</td>
<td>4.1p/kWh</td>
</tr>
<tr>
<td>Biogas</td>
<td>Medium biogas (200kW and above up to 600kW)</td>
<td>5.9p/kWh</td>
</tr>
<tr>
<td></td>
<td>Large biogas (600kW and above)</td>
<td>2.2p/kWh</td>
</tr>
</tbody>
</table>

Source: UK Government
Following the increases to existing tariffs and the expansion of the RHI to new technologies, the following tariffs are available:

**Non-domestic RHI tariffs (p/KWh)**

<table>
<thead>
<tr>
<th>Technology</th>
<th>Tier 1</th>
<th>Tier 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Existing technologies</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biomass Boilers</td>
<td>Small</td>
<td>Medium</td>
</tr>
<tr>
<td>Ground source heat pumps</td>
<td>Large</td>
<td>Medium</td>
</tr>
<tr>
<td>Solar Thermal</td>
<td>Large</td>
<td>Large</td>
</tr>
<tr>
<td><strong>New technologies</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air-source heat pumps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ground and water-source heat pumps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biomass-only boilers and biomass pellet stoves with integrated boilers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solar thermal panels (flat plate and evacuated tube for hot water only)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: UK Government

**New technologies**: Only air-to-water heat pumps will be eligible for the scheme. Air-to-air heat pumps will not be. Biogas capacity limits have also been extended beyond 200 KWh, while Energy from waste has been extended to cover industrial and commercial waste.

**Heat pump eligibility**: Extra requirements for ground and air source heat pumps have been introduced, including a requirement for pumps to have a design seasonal performance factor of at least 2.5 and a requirement for ground-source heat pumps with simultaneous heating and cooling to provide quarterly meter readings of electrical input and heat drawn from the ground.

**Biomass Sustainability**: New legislation is being crafted to introduce sustainability requirements for the RHI. This will likely impact the biomass feedstock that can be used. The rules should come into effect in the Autumn of 2014.

**Domestic RHI**

Following an 18-month delay, the domestic RHI was launched in April 2014. The domestic RHI is targeted at, but not limited to, homes not connected to the gas grid, of which there are about 4 million in the UK. These homes are typically heated using oil, electricity or LPG, which is on average 50%-100% more expensive than mains gas. DECC hopes the domestic RHI will support 750,000 renewable heat systems by 2020.

Tariffs are paid on a quarterly basis for seven years based on the technology that is adopted. Tariff levels reflect expected costs of renewable heat generation over a 20-year period.

<table>
<thead>
<tr>
<th>TECHNOLOGY</th>
<th>TARIFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air-source heat pumps</td>
<td>7.3p/kWh</td>
</tr>
<tr>
<td>Ground and water-source heat pumps</td>
<td>18.8p/kWh</td>
</tr>
<tr>
<td>Biomass-only boilers and biomass pellet stoves with integrated boilers</td>
<td>12.2p/kWh</td>
</tr>
<tr>
<td>Solar thermal panels (flat plate and evacuated tube for hot water only)</td>
<td>19.2p/kWh</td>
</tr>
</tbody>
</table>

Source: UK Government

Applications for the domestic RHI opened on 9 April 2014. Importantly, the scheme also applies to the c.18,000 legacy renewable heating systems that were installed between 15 July 2009 and 8 April 2014.
the overall budget. The tariff reduction limits, or triggers, for each quarter through January 2016 are outlined in the table below:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Biomass boilers</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Budget trigger (£ million)</td>
<td>2.4</td>
<td>4.2</td>
<td>6</td>
<td>8.4</td>
<td>11.9</td>
<td>15.5</td>
<td>19.1</td>
</tr>
<tr>
<td>Budget super trigger (£ million)</td>
<td>4.8</td>
<td>8.4</td>
<td>12</td>
<td>16.8</td>
<td>23.9</td>
<td>31.1</td>
<td>38.2</td>
</tr>
<tr>
<td><strong>Air source heat pumps</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Budget trigger (£ million)</td>
<td>2.4</td>
<td>4.2</td>
<td>6</td>
<td>8.4</td>
<td>11.9</td>
<td>15.5</td>
<td>19.1</td>
</tr>
<tr>
<td>Budget super trigger (£ million)</td>
<td>4.8</td>
<td>8.4</td>
<td>12</td>
<td>16.8</td>
<td>23.9</td>
<td>31.1</td>
<td>38.2</td>
</tr>
<tr>
<td><strong>Ground source heat pumps</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Budget trigger (£ million)</td>
<td>2.4</td>
<td>4.2</td>
<td>6</td>
<td>8.4</td>
<td>11.9</td>
<td>15.5</td>
<td>19.1</td>
</tr>
<tr>
<td>Budget super trigger (£ million)</td>
<td>4.8</td>
<td>8.4</td>
<td>12</td>
<td>16.8</td>
<td>23.9</td>
<td>31.1</td>
<td>38.2</td>
</tr>
<tr>
<td><strong>Solar thermal collectors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Budget trigger (£ million)</td>
<td>1.2</td>
<td>2.1</td>
<td>2.9</td>
<td>3.9</td>
<td>5</td>
<td>6.1</td>
<td>7.2</td>
</tr>
<tr>
<td>Budget super trigger (£ million)</td>
<td>2.3</td>
<td>4.1</td>
<td>5.9</td>
<td>7.8</td>
<td>10</td>
<td>12.2</td>
<td>14.4</td>
</tr>
</tbody>
</table>

Source: UK Government

The triggers are set to manage total RHI spend at around £35 million in 2014-15 and £80 million in 2015-16. Tariff reduction triggers for April 2016 onwards will be published in 2015-16 when the future RHI budget is known.

Applications for the domestic RHI opened on 9 April 2014. Importantly, the scheme also applies to the c.18,000 legacy renewable heating systems that were installed between 15 July 2009 and 8 April 2014. Legacy systems must apply in the first year of the domestic RHI scheme in accordance with a phased timetable based on whether systems have received renewable heat premium payments (RHPPs). RHPPs are one-off grants designed to assist homeowners meet the cost of installing renewable heat technologies. They were introduced alongside the non-domestic RHI to provide support for domestic installations before the launch of the domestic RHI. The timetable for applications is outlined below:

**April 9 – July 8, 2014:** New and legacy applicants that have not received RHPP can apply

**July 9 – October 8, 2014:** New applicants, legacy applicants that haven’t received RHPP, and those that applied for a RHPP voucher before May 20, 2013, can apply.

**October 9, 2014 – March 30, 2015:** New applicants and all legacy applicants can apply.

**Year 2 onwards:** Only new applicants can apply.

Homeowners must pay for a green deal assessment of their home, typically costing £100-£150, before being eligible for the RHI scheme.
League Tables

Methodology

League tables are based on deals that were announced during the 2013 calendar year. The only exception is the league table ranking legal advisors, which is based on deals that completed in 2013. This approach has been adopted as advisors are often not disclosed until after a transaction has been completed.

Qualifying transactions must be classified within at least one of the following sub-sectors: advanced materials & technologies; sustainable agriculture; biofuels; biomass; clean coal; energy efficiency; environmental services & remediation; geothermal; green transportation; hydro; hydrogen generation; marine; microgeneration; recycling & waste; solar; water & wastewater treatment; and wind. For a full description of our sector definitions please visit www.cleanenergypipeline.com.

**Number of deals ranking**: for investor league tables, this is defined as the number of individual companies invested in (not individual investments or transactions) during 2013. For advisor league tables, this is defined as the number of individual transactions that have been completed in which an advisor has been involved. Where more than one adviser or investor has been involved in the same number of transactions, the higher ranking is given to the adviser or investor associated with the highest aggregate deal value.

**Deal credit**: the deal credit allocated to an investor is calculated for each transaction by dividing the total value of a transaction by the number of investors participating in the fundraising. Deals of an undisclosed size are assigned a deal value of zero, apart from M&A transactions involving operational onshore wind and solar PV assets. In such transactions, a deal value is estimated on the basis of installed capacity using Clean Energy Pipeline’s multiples.

Deal credit for legal advisors is calculated using the same methodology. If more than one advisor represents one party in a deal, the deal credit is divided equally between the advisors.

As our online platform is updated in real time, league table rankings may differ from the time of this release and the data found in our online platform at a later date. The Clean Energy Pipeline league tables are based on deal information which has been collected by or provided to our team. Clean Energy Pipeline endeavours to guarantee the accuracy of the deal information used to compile the league tables. At the end of each quarter, organisations are invited to email us a quarterly deal summary in any format to ensure that all relevant deals are reflected in the Clean Energy Pipeline league tables. All submissions should be emailed to Thai Tran at thai.tran@vbresearch.com. Clean Energy Pipeline reserves the rights to decline inclusion of deals that it deems fall outside its definitions or methodology.
The following league tables rank the most active investors, banks and law firms in the UK clean energy sector in 2013. Rankings are based on deals involving UK-based investee companies, M&A targets or projects tracked by Clean Energy Pipeline’s deal data team. Our methodology is described on the previous page.

### Project & Asset Finance - Top 10 Lenders by Deal Credit

<table>
<thead>
<tr>
<th>Rank</th>
<th>Lender</th>
<th>Number of Deals</th>
<th>Deal Credit ($ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>European Investment Bank</td>
<td>5</td>
<td>1,026</td>
</tr>
<tr>
<td>2</td>
<td>HSBC</td>
<td>5</td>
<td>465</td>
</tr>
<tr>
<td>3</td>
<td>Sumitomo Mitsui Banking Corp.</td>
<td>6</td>
<td>435</td>
</tr>
<tr>
<td>4</td>
<td>Bank of Tokyo-Mitsubishi UFJ</td>
<td>6</td>
<td>420</td>
</tr>
<tr>
<td>5</td>
<td>UK Green Investment Bank</td>
<td>6</td>
<td>397</td>
</tr>
<tr>
<td>6</td>
<td>Nord LB</td>
<td>6</td>
<td>387</td>
</tr>
<tr>
<td>7</td>
<td>Mizuho Corporate Bank</td>
<td>5</td>
<td>375</td>
</tr>
<tr>
<td>8</td>
<td>Deutsche Bank</td>
<td>4</td>
<td>369</td>
</tr>
<tr>
<td>9</td>
<td>Banco Santander</td>
<td>4</td>
<td>221</td>
</tr>
<tr>
<td>10</td>
<td>The Royal Bank of Scotland</td>
<td>7</td>
<td>219</td>
</tr>
</tbody>
</table>

### Project & Asset Finance - Top 10 Lenders by Number of Deals

<table>
<thead>
<tr>
<th>Rank</th>
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<th>Number of Deals</th>
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<td>Sumitomo Mitsui Banking Corp.</td>
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<td>435</td>
</tr>
<tr>
<td>3</td>
<td>Bank of Tokyo-Mitsubishi UFJ</td>
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<td>UK Green Investment Bank</td>
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<td>397</td>
</tr>
<tr>
<td>5</td>
<td>Nord LB</td>
<td>6</td>
<td>387</td>
</tr>
<tr>
<td>6</td>
<td>GCP Infrastructure Investments</td>
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<td>7</td>
<td>NIBC</td>
<td>6</td>
<td>44</td>
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<tr>
<td>8</td>
<td>European Investment Bank</td>
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<td>1,026</td>
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<tr>
<td>9</td>
<td>HSBC</td>
<td>5</td>
<td>465</td>
</tr>
<tr>
<td>10</td>
<td>Mizuho Corporate Bank</td>
<td>5</td>
<td>375</td>
</tr>
</tbody>
</table>
### PROJECT & ASSET FINANCE - TOP 10 LEAD ARRANGERS BY DEAL CREDIT

<table>
<thead>
<tr>
<th>Rank</th>
<th>Lead Arranger</th>
<th>Number of Deals</th>
<th>Deal Credit ($ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Banco Santander</td>
<td>4</td>
<td>656</td>
</tr>
<tr>
<td>2</td>
<td>HSBC</td>
<td>2</td>
<td>633</td>
</tr>
<tr>
<td>3</td>
<td>National Australia Bank</td>
<td>1</td>
<td>542</td>
</tr>
<tr>
<td>4</td>
<td>Bank of Tokyo-Mitsubishi UFJ</td>
<td>2</td>
<td>442</td>
</tr>
<tr>
<td>5</td>
<td>Deutsche Bank</td>
<td>4</td>
<td>369</td>
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</tbody>
</table>

### PROJECT & ASSET FINANCE - TOP 10 LEAD ARRANGERS BY NUMBER OF DEALS

<table>
<thead>
<tr>
<th>Rank</th>
<th>Lead Arranger</th>
<th>Number of Deals</th>
<th>Deal Credit ($ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Banco Santander</td>
<td>4</td>
<td>656</td>
</tr>
<tr>
<td>2</td>
<td>Deutsche Bank</td>
<td>4</td>
<td>369</td>
</tr>
<tr>
<td>3</td>
<td>Credit Agricole</td>
<td>3</td>
<td>210</td>
</tr>
<tr>
<td>4</td>
<td>HSBC</td>
<td>2</td>
<td>633</td>
</tr>
<tr>
<td>5</td>
<td>Bank of Tokyo-Mitsubishi UFJ</td>
<td>2</td>
<td>442</td>
</tr>
</tbody>
</table>

### VENTURE CAPITAL & PRIVATE EQUITY - TOP 10 INVESTORS IN COMPANIES BY DEAL CREDIT

<table>
<thead>
<tr>
<th>Rank</th>
<th>Investor</th>
<th>Number of Deals</th>
<th>Deal Credit ($ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Foresight Group</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>2</td>
<td>Turquoise International</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td>3</td>
<td>Imperial Innovations Group</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>4</td>
<td>Sofinnova Partners</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>5</td>
<td>Carbon Trust Investments</td>
<td>3</td>
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### VENTURE CAPITAL & PRIVATE EQUITY - TOP 10 INVESTORS IN COMPANIES BY NUMBER OF DEALS

<table>
<thead>
<tr>
<th>Rank</th>
<th>Investor</th>
<th>Number of Deals</th>
<th>Deal Credit ($ million)</th>
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<tr>
<td>1</td>
<td>Turquoise International</td>
<td>11</td>
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<td>2</td>
<td>Scottish Enterprise</td>
<td>5</td>
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<tr>
<td>3</td>
<td>The North West Fund</td>
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<td>4</td>
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<tr>
<td>4</td>
<td>Imperial Innovations Group</td>
<td>3</td>
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### PROJECT & ASSET FINANCE - TOP 10 LEGAL ADVISORS BY DEAL CREDIT

<table>
<thead>
<tr>
<th>Rank</th>
<th>Legal Advisor</th>
<th>Number of Deals</th>
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<tbody>
<tr>
<td>1</td>
<td>Allen &amp; Overy</td>
<td>11</td>
<td>3,447</td>
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<tr>
<td>2</td>
<td>Ashurst</td>
<td>3</td>
<td>2,052</td>
</tr>
<tr>
<td>3</td>
<td>Linklaters</td>
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<tr>
<td>4</td>
<td>Norton Rose Fulbright</td>
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<td>Kromann Reumert</td>
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</tr>
<tr>
<td>6</td>
<td>Blanke Meier Evers</td>
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<tr>
<td>7</td>
<td>Bruun &amp; Hjejle</td>
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<td>1,251</td>
</tr>
<tr>
<td>8</td>
<td>Eversheds</td>
<td>18</td>
<td>1,204</td>
</tr>
<tr>
<td>9</td>
<td>Hogan Lovells International</td>
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<td>723</td>
</tr>
<tr>
<td>10</td>
<td>Burges Salmon</td>
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### PROJECT & ASSET FINANCE - TOP 10 LEGAL ADVISORS BY NUMBER OF DEALS

<table>
<thead>
<tr>
<th>Rank</th>
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<th>Number of Deals</th>
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<tr>
<td>1</td>
<td>Eversheds</td>
<td>18</td>
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<td>Norton Rose Fulbright</td>
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<td>Hogan Lovells International</td>
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<tr>
<td>9</td>
<td>Simmons &amp; Simmons</td>
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<tr>
<td>10</td>
<td>Watson, Farley &amp; Williams</td>
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<td>107</td>
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### VENTURE CAPITAL & PRIVATE EQUITY AND M&A - TOP 10 LEGAL ADVISORS BY DEAL CREDIT

<table>
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<tr>
<th>Rank</th>
<th>Legal Advisor</th>
<th>Number of Deals</th>
<th>Deal Credit ($ million)</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Norton Rose Fulbright</td>
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<tr>
<td>2</td>
<td>Simmons &amp; Simmons</td>
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<tr>
<td>5</td>
<td>Squire Patton Boggs</td>
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### VENTURE CAPITAL & PRIVATE EQUITY AND M&A - TOP 10 LEGAL ADVISORS BY NUMBER OF DEALS

<table>
<thead>
<tr>
<th>Rank</th>
<th>Legal Advisor</th>
<th>Number of Deals</th>
<th>Deal Credit ($ million)</th>
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<tbody>
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<td>1</td>
<td>Burges Salmon</td>
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<td>Eversheds</td>
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<td>Squire Patton Boggs</td>
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<td>Taylor Wessing</td>
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<tr>
<td>5</td>
<td>Norton Rose Fulbright</td>
<td>6</td>
<td>1,303</td>
</tr>
</tbody>
</table>
Public Markets

UK

This section analyses public markets deal activity in the UK renewable energy sector in 2013 and the first quarter of 2014. Transaction data in this section has been extracted directly from Clean Energy Pipeline’s public markets deal database. Given the scarcity of cleantech IPOs in the UK of late, this analysis concentrates on capital raised by renewable energy companies and investors.

UK renewable energy public markets activity rebounded in 2013 following a fallow three years. UK renewable energy companies secured $1.8 billion through IPOs and secondary offerings in 2013, a significant increase on the $25 million secured in 2012 and $185 million in 2011. This trend looks to be continuing this year, with UK companies raising $289 million on the public markets in 1Q14 alone.

The recent increase is a direct result of the emergence of YieldCo vehicles, which accounted for 82% ($1.7 billion) of all funds raised by UK renewable energy companies in 2013 and 1Q14. YieldCos have proved attractive to investors as they offer an inflation-linked yield that, in the current low-interest environment, is more attractive than mainstream fixed income instruments such as bonds. Indeed all YieldCos offer initial yields of 6% or more. The investment strategies of the six YieldCos currently listed in the UK – Greencoat UK Wind, TRIG, Foresight Solar Fund, Bluefield Solar Income Fund, John Laing Environmental Assets Group...
and NextEnergy Solar Fund – are outlined in the table below.

Recent YieldCo listings indicate that investor appetite for these structures may be waning. The £85.6 million raised by NextEnergy Solar Fund in April 2014, the most recent YieldCo IPO, was at the minimum end of its range for the offering, which had targeted up to £150 million when it was announced in January. In addition, the £150 million that Foresight Solar Fund raised through its IPO in October 2013 was £50 million less than the £200 million it initially targeted, while an £83 million secondary offering by Greencoat UK Wind in December 2013 was £50 million short of a targeted £135 million.

The emergence of YieldCo funds was one of the most exciting developments in the UK renewable energy sector in 2013. Not only do they lower the cost of capital, a key element of total project costs, they also enable project owners to recycle capital into new investments.

The only non-YieldCo IPO in 2013 was executed by Infinis Energy, owner of the largest renewable energy portfolio in the UK. In November 2013, private equity fund Terra Firma raised £234 million through floating a 30% stake in the company on the London Stock Exchange.

Notable European YieldCo funds

**Greencoat UK Wind**

<table>
<thead>
<tr>
<th>Description</th>
<th>Total funds raised: £345 million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Asset portfolio</td>
</tr>
<tr>
<td>Greencoat UK Wind raised £260 million through an IPO on the London Stock Exchange in March 2013, and a further £85 million through secondary offerings in December 2013 and January 2014. Greencoat UK Wind mainly invests in operating onshore and offshore wind farms in the UK with a capacity of over 10 MW. No more than 40% of its portfolio will comprise offshore wind, and no wind farm will be acquired if the acquisition price is over 25% of the total portfolio value. The company seeks to acquire 100%, majority or minority interests in wind farms.</td>
<td>UK: 161.55 MW onshore wind portfolio (Braes of Doune - 36 MW, Tappaghan - 28.5 MW, Middlemoor - 26.5 MW, Little Cheyne Court - 24.5 MW, Cotton Farm - 16.4 MW, Earl’s Hall Farm - 10.25 MW, Bin Mountain - 9 MW, Carcant - 6 MW, Lindhurst - 4.4 MW)</td>
</tr>
<tr>
<td>IPO date: March 2013</td>
<td>Target dividend per share: 6%</td>
</tr>
</tbody>
</table>

**The Renewables Infrastructure Group (TRIG)**

<table>
<thead>
<tr>
<th>Description</th>
<th>Total funds raised: £376 million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Asset portfolio</td>
</tr>
<tr>
<td>TRIG invests in operational renewable energy projects in the UK and Northern European countries. In July 2013, the company raised £300 million through an IPO on the London Stock Exchange. The fund primarily invests in onshore wind and solar PV projects, and limits investment in other forms of energy technology, such as biomass and offshore wind, to 10% of portfolio value. No more than 50% of the fund will be invested in projects outside the UK, and no single asset will account for more than 20% of the portfolio. TRIG will typically acquire majority stakes.</td>
<td>UK: 195.5 MW onshore wind farm portfolio (Hill of Towie - 48.3 MW, Altahuillio - 37.7 MW, Green Hill - 28 MW, Roos - 17.1 MW, The Grange - 14 MW, Lendrums Bridge - 13.2 MW, Lough Hill - 7.8 MW, Fors - 7.2 MW, Tallentire - 12 MW, Meskie Carewe - 10.2 MW)</td>
</tr>
<tr>
<td>IPO date: July 2013</td>
<td>Target dividend per share: 6%</td>
</tr>
</tbody>
</table>
# Bluefield Solar Income Fund

**Total funds raised:** £143 million

**Description**
Bluefield Solar Income Fund raised £130 million through an IPO in July 2013. It invests in solar PV projects in the UK. The company primarily acquires majority stakes, but will also make minority investments. The company may leverage short-term debt finance to facilitate acquisitions, but short-term debt will not exceed 50% of the gross asset value. No single investment will represent more than 25% of the fund’s net asset value.

**Asset portfolio**
- UK: 128.5 MW solar PV portfolio

**IPO date:** July 2013
**Target dividend per share:** 7%

---

# Foresight Solar Fund

**Total funds raised:** £150 million

**Description**
Foresight Solar Fund raised £150 million through an IPO in October 2013. The company typically invests in operational solar power plants in the UK. The company will limit investments in non-UK projects and construction-stage assets to a maximum of 25% of the fund’s gross asset value. The fund will acquire both majority and minority stakes in projects. No single investment will comprise more than 30% of the portfolio value.

**Asset portfolio**
- UK: 174.1 MW solar PV portfolio
  - Wymeswold - 32.2 MW, Castle Eaton - 17.8 MW, Highfields - 12.2 MW, Hunters Race - 10.7 MW, High Penn - 9.6 MW, Spriggs Farm - 12 MW, Pitworthy 16 MW, Kencot - 37 MW, Bournemouth - 37.3 MW

**IPO date:** October 2013
**Target dividend per share:** 6%

---

# John Laing Environmental Assets Group

**Total funds raised:** £160 million

**Description**
John Laing Environmental Assets Group (JLEN) raised £160 million through an IPO on the London Stock Exchange in March 2014. Upon completion of the IPO, it completed the acquisition of seven environmental infrastructure assets, six from the John Laing Group. John Laing Investments Ltd holds 39.7% of the voting rights attached to the share capital of the company. Unlike other YieldCos, JLEN will invest in waste and waste water PFI assets alongside renewable energy.

**Asset portfolio**
- UK: 44.4 MW onshore wind farm portfolio
  - Hall Farm - 24.6 MW, Bilthorpe - 10.2 MW, Castle Pill and Ferndale - 9.6 MW
- UK: 24.5 MW solar PV portfolio
- UK: Waste Treatment Portfolio
  - D&G Waste, ELWA Waste

**IPO date:** March 2014
**Target dividend per share:** 6%

---

# NextEnergy Solar Fund

**Total funds raised:** £85.6 million

**Description**
NextEnergy Solar Fund raised £85.6 million through an IPO on the London Stock Exchange in April 2014. It will primarily target UK solar PV assets. According to Director Michael Bonte-Friedheim, the first £85.6 million will be used to acquire eight UK solar projects.

**Asset portfolio**
- UK: 21.8 MW solar PV portfolio
  - Higher Hatherleigh - 6.1 MW, Shacks Barn – 6.3 MW, Gover Farm – 9.4 MW

**IPO date:** April 2014
**Target dividend per share:** 6.25% (5.25% for the year ending 31/03/2015)
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This section analyses project finance deal activity in the UK’s clean energy sector in 2013 and 1Q14. The analysis is based on deals tracked by Clean Energy Pipeline’s deal data team.

UK clean energy project finance totaled $12.6 billion in 2013, a 19% increase on the $10.6 billion invested in 2012. There has been a robust start to 2014 - $3.7 billion was invested in UK clean energy projects in 1Q14, a 37% increase on the quarterly average during the past two years.

Solar in focus

The increase in UK clean energy project finance was a direct result of a surge in solar PV investment. Some $1.9 billion debt and equity was invested in UK solar projects in 2013, compared with only $514 million in 2012. This was caused by continuing decreases in the price of solar modules, a stable regulatory environment and the resolution of the EU-China solar antidumping dispute.

In July 2013 the EU and China reached a compromise agreement on the minimum price that Chinese manufacturers can sell in Europe. If an agreement had not been reached, Europe would have imposed hefty tariffs on Chinese imports in August 2013. Reflecting the extent to which
solar PV investment had been held back by this uncertainty, almost two thirds ($1.2 billion) of total solar investment in 2013 was invested in the second half of the year, once the antidumping standoff had been resolved.

Investment in UK solar has accelerated in 2014 - $1.6 billion project finance was allocated to solar in Q14, only 16% less than the sum invested during the entirety of 2013. However, the long-term outlook for investment in UK solar is uncertain. In May 2014 the Government announced that new solar projects of more than 5 MW will not be eligible for the Renewables Obligation (RO) from April 2015 and will have to compete for Contracts for Difference with other renewable energy sources, two years earlier than the original RO end date of 2017. The effects of this are explored in detail in Conergy’s white paper, ‘Risk & reward in Europe’s biggest solar market’ on page 16.

Notable solar deals in 2013 included a mixture of financings of utility-scale projects and commitments to fund the construction of large portfolios of residential projects. For example, solar contractor Forrest agreed an up to £120 million three-year residential funding agreement with Macquarie Bank in December 2013. Also that month, power producer Grid Essence announced it had entered into a £77 million financing facility with Deutsche Bank to fund construction of up to 60 MW of solar PV projects.

**Onshore wind in focus**

Some $3.0 billion project finance was allocated to UK onshore wind projects in 2013, a 3% decrease on the $3.1 billion invested in 2012. Investment levels were robust in 2013 due to the strong regulatory framework and a large pipeline of projects seeking financing. Deal activity was also boosted by a growing number of refinancings of operating wind farms – some $1.7 billion of project debt finance was refinanced in 2013, compared with only $600 million in 2012.
The largest UK wind deal in 2013 was the £329.5 million secured by power producer Infinis to refinance its 274 MW wind portfolio. National Australia Bank partially underwrote the new facilities, while Royal Bank of Scotland and Abbey National Treasury Services, trading as Santander Global Banking & Markets, acted as lead arranger. The second largest deal was the £151 million secured by Norwegian developer Fred Olsen Renewables to fund construction of a 103 MW portfolio of two wind farms in Scotland in February 2013.

Onshore wind project financing has made a slow start to 2014 – only $294 million was invested in 1Q14, which is under half the $757 million quarterly average volume of investment during the past two years. This should not be interpreted as a sign that investor appetite for onshore wind is waning. Despite the Conservative Party’s promise that it will end subsidies for onshore wind farms not already in construction or with planning permission if it wins the 2015 election, there is still 7 GW of onshore wind farms approved or in construction, a large proportion of which still needs to be financed.

**Offshore wind in focus**

Some $3.9 billion debt and equity was invested in UK offshore wind farms in 2013, in line with the $3.8 billion invested in 2012. This figure includes $1.7 billion investment in three transmission assets for the London Array, Greater Gabbard and Sheringham Shoal offshore wind farms. The remainder was invested in offshore wind generation assets.

Only one UK offshore wind farm secured project debt finance in 2013. In October 2013 Masdar closed a £266 million, 12 year limited-recourse project finance package for its 20% stake in the 630 MW first phase of the London Array offshore wind farm. The refinancing of Masdar’s stake was supported by five international lenders including the state-funded UK Green Investment Bank (GIB), which provided £59 million of debt. The other participants were The Bank of Tokyo-Mitsubishi UFJ Ltd., KFW-IPEX Bank, Siemens Bank GmbH and Sumitomo Mitsui Banking Corporation. The refinancing is the first time that a limited-recourse structure has been completed for an unincorporated joint venture within the renewable energy industry.
19% of VC/PE investment in the UK was allocated to the Biofuels sector in 2013.
This section analyses venture capital and private equity investment in the UK’s clean energy sector. The analysis is based on deals tracked in Clean Energy Pipeline’s venture capital and private equity deal database.

Venture capital and private equity investment (excluding buyouts) in UK clean energy companies plummeted to $253 million in 2013, under half the $678 million invested in 2012. This is the lowest annual volume of investment in the UK since 2005. The number of investments also declined, albeit to a lesser extent – venture capital and private equity firms completed 41 investments in 2013, compared with 65 in 2012.

The decline in investment was so significant because investment plummeted across a number of sub-sectors that have previously attracted significant sums of capital. Only $47 million was invested in UK energy efficiency companies in 2013, under half the $95 million annual average investment volume during the previous four years. There was also a distinct lack of investment in biomass ($2 million invested in 2013) and recycling and waste ($4 million invested in 2013). In 2012 these two sectors attracted $136 million and $137 million respectively.

This trend is mirrored across Europe, where venture capital and private equity investment (excluding buyouts) declined 19% annually to $6.5 billion. That said, the UK posted
The only positive news in 2013 was the uptick in investment in UK biofuels companies - $47 million was invested in UK biofuels companies in 2013, compared with only $5 million in 2012 and $20 million in 2011. This was a direct result of large funding rounds secured by renewable chemicals and biofuels producer GreenBiologics (£15.4 million) and bioethanol facility developer Vireol (£8 million).

Other notable deals in 2013 include fuel cell provider Intelligent Energy, which secured £32 million from undisclosed investors in October 2013, and waterless-laundry technology company XEROS, which secured £10 million from angel and seed investors in March 2013.
Mergers & Acquisitions

UK

This section analyses M&A activity in the UK renewable energy sector in 2013 and the first quarter of 2014. Transaction data has been extracted directly from Clean Energy Pipeline’s M&A deal database. Because the majority of M&A activity is characterised by acquisitions of renewable energy assets, this section is dedicated to trends in renewable energy M&A, and therefore excludes acquisitions of cleantech companies.

Some 95 renewable energy M&A transactions valued at $4.6 billion were announced in 2013, more than double the 44 deals totalling $2.2 billion recorded in 2012. This trend has continued in the beginning of 2014 – 28 M&A transactions valued at $2.4 billion were announced in the UK in 1Q14, making it the most active quarter by deal value in the past three years.

This surge in M&A activity was caused by three factors - the emergence of YieldCos as active acquirers of operating onshore wind and solar PV assets, continuance of strong interest amongst institutional investors to acquire large portfolios of renewable energy assets, and the sale of stakes in large offshore wind farms by utilities.

Institutional investors dominate the M&A landscape

Institutional investors, including pension funds, insurance companies and Japanese trading houses, accounted for only 9% of the number of acquisitions announced in 2013 and 1Q14, but 50% of the total value

UK renewable energy M&A activity
1Q11 to 1Q14

Source: Clean Energy Pipeline
of announced deals. Institutional investors find renewable energy projects enticing because they offer yields that are more attractive than government bonds and other traditional asset classes in the current low-yield environment.

Notably, the UK is a target for institutional investors around the world, including Scandinavian pension funds such as PensionDanmark, Japanese trading houses like Mitsubishi and Marubeni, and Canadian life insurance company La Caisse de dépôt et placement du Québec. In the UK, institutional investors have primarily invested in offshore wind farms and large portfolios of onshore wind assets that enable them to deploy large sums of capital at once.

**YieldCos enter the fray**

M&A activity was also boosted in 2013 by the emergence of YieldCos, which are publically listed infrastructure investment funds that offer investors a fixed dividend based on the returns from investments in operating renewable energy assets. YieldCos were the most active acquirers in terms of deal numbers in 1Q13 and 1Q14, accounting for 28% of all announced M&A transactions, followed by corporates (27%) and private equity and infrastructure funds (18%). YieldCos were the second most active investors in terms of the value of announced M&A deals, accounting for 23% of total deal value. The first YieldCo, Greencoat
UK Wind, listed on the London Stock Exchange in March 2013, meaning no YieldCos announced renewable energy acquisitions before 2013.

Large offshore wind transactions boost deal activity

The surge in UK renewable energy M&A activity was also a direct result of a series of large offshore wind deals. Acquisitions of offshore wind generation and transmission assets accounted for 48% of the total value of renewable energy activity in the UK in 2013 and 1Q14, but only 8% of the number of announced deals. Offshore wind M&A activity is being fuelled by the desire of utilities to bolster their balance sheets and recycle capital into new offshore wind investments.

Aside from offshore wind, there has also been a significant number of acquisitions of onshore wind generation assets since the start of 2013. Some 34 onshore wind projects, or portfolios of projects, valued at $1.9 billion were acquired in 2013 and 1Q14, representing 28% of the total number of deals. According to deals tracked by Clean Energy Pipeline, operating UK onshore wind assets were acquired for an average of £1.7 million per MW during 2013.
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London, UK
www.abundancegeneration.com
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Project sponsor

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VC - Early Growth (Series A to C)

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ADVISORY FOCUS:
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INVESTMENT FOCUS:
Project sponsor

Axiom Solar Ltd.
Kettering, UK
www.axiomenergygroup.com
INVESTMENT FOCUS:
Project sponsor
Ayrenergy Ltd.
Deerness, UK
www.ayrenergy.com
INVESTMENT FOCUS:
Project sponsor

BBVA
Bilbao, Spain
www.bbva.es
INVESTMENT FOCUS:
Debt provider

BNRG Renewables Ltd.
Dublin, Ireland
www.bnrg.ie
INVESTMENT FOCUS:
Project sponsor

Balfour Beatty Infrastructure Partners LLP
London, UK
www.bbip.com
INVESTMENT FOCUS:
Project sponsor, M&A Acquirer

Balfour Beatty Investments
London, UK
www.balfourbeatty.com
INVESTMENT FOCUS:
Project sponsor

Banco Santander SA
Madrid, Spain
www.santander.com
INVESTMENT FOCUS:
Debt provider, Project sponsor, M&A Acquirer
ADVISORY FOCUS:
Financial advisory - Project finance

Barclays Infrastructure Funds Management Ltd.
London, UK
barclaysinfrastructurefunds.com
INVESTMENT FOCUS:
Project sponsor, M&A Acquirer

Barclays plc
London, UK
www.barcap.com
ADVISORY FOCUS:
Financial advisory - M&A

BayernLB
Munich, Germany
www.bayernlb.de
INVESTMENT FOCUS:
Debt provider

BayWa r.e. renewable energy GmbH
Munich, Germany
www.baywa-re.com
INVESTMENT FOCUS:
Project sponsor, M&A Acquirer

BBDO LLP
London, UK
www.bdo.uk.com
ADVISORY FOCUS:
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Belltown Alpha Renewables
London, UK
www.belltownpower.com
INVESTMENT FOCUS:
Project sponsor, M&A Acquirer

Biffa Ltd.
High Wycombe, UK
www.biffa.co.uk
INVESTMENT FOCUS:
M&A Acquirer

Bill & Melinda Gates Foundation
Seattle, WA, USA
www.gatesfoundation.org
INVESTMENT FOCUS:
Grant & Government Funding

Bindu Trust
Jersey, UK
INVESTMENT FOCUS:
PIPE

BlackRock Inc.
New York, NY, USA
www.blackrock.com
INVESTMENT FOCUS:
M&A Acquirer

Blue Energy Ltd.
Cheshire, UK
www.blue-energyco.com
INVESTMENT FOCUS:
Project sponsor, M&A Acquirer

Bluefield Solar Income Fund Ltd.
London, UK
www.bluefieldllp.com
INVESTMENT FOCUS:
Project sponsor, M&A Acquirer

BNP Paribas SA
Paris, France
www.bnparibas.com
ADVISORY FOCUS:
Financial advisory - Project finance

Bond Dickinson LLP
Newcastle-upon-Tyne, UK
www.bondpearce.com
ADVISORY FOCUS:
Legal advisory - Project finance, M&A, Venture capital & private equity

Braemar Energy Ventures
New York, NY, USA
www.braemarenergy.com
INVESTMENT FOCUS:
VC - Early Growth (Series A to C)

British Gas
Worthing, UK
www.britishgas.co.uk
INVESTMENT FOCUS:
VC - Early Growth (Series A to C)

British Solar Renewables Ltd.
Somerset, UK
www.britishrenewables.com
INVESTMENT FOCUS:
Project sponsor

Budget Pack Ltd.
Bristol, UK
www.budget-pack.com
INVESTMENT FOCUS:
M&A Acquirer

Burges Salmon LLP
Bristol, UK
www.burges-salmon.com
ADVISORY FOCUS:
Legal advisory - Project finance

Burmeister & Wain Scandinavian Contractor AS
Alleroed, Denmark
www.bwsc.com
INVESTMENT FOCUS:
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Europe’s leading cleantech cluster

www.cambridgecleantech.org.uk
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**Conergy UK Ltd.**

Founded in 1998, Conergy pioneered the expansion of solar power internationally and today combines innovative technology, industry-leading engineering with access to capital. Headquartered in Hamburg, Germany, Conergy has a global sales network and subsidiaries in 11 countries. The company is privately-held and majority-owned by Miami-based asset management firm Kawa Capital Management Inc. Conergy UK & Ireland, based in Milton Keynes, has worked on some of Britain’s most pioneering projects combining global experience with local expertise.

**Contact:**

Cindy Pooler
Marketing Manager
c.pooler@conergy.co.uk
+44 (0)19 0893 3718
<table>
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<th>Company Name</th>
<th>Location</th>
<th>Website</th>
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<td>CMS Cameron McKenna</td>
<td>London, UK</td>
<td><a href="http://www.cms-cmck.com">www.cms-cmck.com</a></td>
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<td>CropEnergies AG</td>
<td>Mannheim, Germany</td>
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<td>Investment focus: M&amp;A Acquirer</td>
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<td>Crowdcube Ltd.</td>
<td>Exeter, UK</td>
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<td>Investment focus: VC - Early Growth (Series A to C), Angel Funding</td>
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<td>CSG Ltd.</td>
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<td>Colville Partners Ltd.</td>
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<td><a href="http://www.colvilllepartners.com">www.colvilllepartners.com</a></td>
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<td>Community Windpower Ltd.</td>
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<td>Connection Capital LLP</td>
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<td>ConocoPhillips</td>
<td>Houston, TX, USA</td>
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<td>Co-operative Bank plc</td>
<td>Manchester, UK</td>
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<td>Copenhagen Infrastructure Partners</td>
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<td>EMERGE</td>
<td>Manchester, UK</td>
<td><a href="http://www.emergemanchester.co.uk">www.emergemanchester.co.uk</a></td>
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<td>Energiekontor AG</td>
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www.falkrenewables.eu  
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<td>Copenhagen</td>
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<td><a href="http://www.pinsentmasons.com">www.pinsentmasons.com</a></td>
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London, UK  
www.platinafinance.com

**Investment Focus:**  
M&A - Acquirer

**About:**  
Platina Energy Partners LLP is an independent European investment firm established in 2002. It focuses on renewable energy infrastructure project with a team of 20 professionals enjoying a track record of developing, financing, constructing, and operating over 700MW of on-shore wind and solar projects across Europe. The experienced team is based in London and Milan and has a track-record of delivering value to its investors comprising of leading institutional investors, pension funds and family offices.

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www.qi3.co.uk

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**Renewable Energy Generation Ltd.**
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www.renewableenergygeneration.co.uk

**Investment Focus:**  
Project sponsor, M&A Acquirer

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therenewablefinancingcompany.com

**Investment Focus:**  
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**About:**  
The Renewable Financing Company (“TRFC”) is a dedicated lending platform to the renewable sector and Novatio Capital Limited acts as its administrator. TRFC offers three types of debt facility:

- Construction Finance where we work closely with renewable developers, EPC contractors and equity sponsors to support them;
- Asset Refinancing where we provide long term financing solutions for existing operational assets;
- Sustainable Property Lending where we can provide a landowner with senior debt secured against the lease payment received from renewable assets.

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**PriceWaterhouseCoopers**
London, UK  
www.pwc.com

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RES is one of the world’s leading renewable energy companies, with extensive experience in developing, engineering, financing, constructing and operating utility-scale infrastructure projects across a wide range of low carbon technologies including wind, solar, marine, thermal, storage, transmission and demand-side management. RES has developed and/or constructed more than 140 projects globally, with a combined capacity of over 8GW. Its onshore asset management portfolio exceeds 1.3GW of installed capacity (owned both by RES and institutional investors).

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**ABOUT:**
RBS has been the leading bank in the provision of finance to the UK renewable energy sector 2011-2013. With over 20 years of experience, our teams of specialists combine expertise across all mainstream generation technologies with a range of professional backgrounds including banking, law, engineering, accountancy and advisory. In addition, we have a dedicated in-house financial analytics and transactions team, making RBS one of the largest dedicated power project finance teams in the UK.

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The Energy Efficiency Financing Team
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Taylor Wessing is a leading international law firm with more than 1,000 lawyers across Europe, the Middle East and Asia. We have a long-standing international Energy group comprising more than 60 lawyers. Our renewable energy practice advised on some of Europe’s earliest renewable projects and continues to be an active player in the renewables sector.

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<td><strong>UK Department of Energy and Climate Change</strong></td>
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<td>Grant &amp; Government Funding</td>
<td>London, UK</td>
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<tr>
<td><strong>UK Green and Sustainable Waste and Energy Investment LP</strong></td>
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<td>M&amp;A Acquirer</td>
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<tr>
<td><strong>UK Green Investment Bank</strong></td>
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<td>Debt provider, M&amp;A Acquirer</td>
<td>London, UK</td>
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<tr>
<td><strong>UK Waste Resources and Energy Investments Fund</strong></td>
<td></td>
<td>Project sponsor</td>
<td>London, UK</td>
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<tr>
<td>Unicredit Spa</td>
<td></td>
<td>Debt provider</td>
<td>Milan, Italy</td>
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<tr>
<td><strong>Union Investment Group</strong></td>
<td></td>
<td>Debt provider</td>
<td>Frankfurt, Germany</td>
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<tr>
<td>UrbanWind</td>
<td></td>
<td>M&amp;A Acquirer</td>
<td>Glasgow, UK</td>
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<td>Urbaser SA</td>
<td></td>
<td>Project sponsor</td>
<td>Madrid, Spain</td>
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**VC - Early Growth (Series A to C)**
Financial advisory - Venture capital & private equity

**UK Green and Sustainable Waste and Energy Investment LP**
INVESTMENT FOCUS: M&A Acquirer

**UK Green Investment Bank**
INVESTMENT FOCUS: Debt provider, M&A Acquirer

**UK Waste Resources and Energy Investments Fund**
INVESTMENT FOCUS: Project sponsor

**Unicredit Spa**
INVESTMENT FOCUS: Debt provider

**Union Investment Group**
INVESTMENT FOCUS: Project sponsor, M&A Acquirer

**UrbanWind**
INVESTMENT FOCUS: M&A Acquirer

**Urbaser SA**
INVESTMENT FOCUS: Project sponsor

**Vattenfall AB**
INVESTMENT FOCUS: Project sponsor

**Velocita Energy Developments Ltd.**
INVESTMENT FOCUS: Project sponsor

**Vitruvian Partners LLP**
INVESTMENT FOCUS: M&A Acquirer
**Clean Energy Pipeline**

**Directory**

**W**

**Wacker Chemie AG**  
Munich, Germany  
www.wacker.com  
**INVESTMENT FOCUS:**  
Minority / Partnership

**Walker Morris LLP**  
Leeds, UK  
www.walkermorris.co.uk  
**ADVISORY FOCUS:**  
Legal advisory - Project finance

**Watson, Farley & Williams LLP**  
London, UK  
www.wfw.com  
**ADVISORY FOCUS:**  
Legal advisory - Project finance, Legal advisory - M&A

**Westmill Solar Farm Co-operative Ltd.**  
UK  
www.westmillsolar.coop  
**INVESTMENT FOCUS:**  
Project sponsor

**WH Ireland Group plc**  
Manchester, UK  
www.wh-ireland.co.uk  
**ADVISORY FOCUS:**  
Financial advisory - Venture capital & private equity

**White & Case LLP**  
New York, NY, USA  
www.whitecase.com  
**ADVISORY FOCUS:**  
Legal advisory - Project finance

**William Tracey Group**  
Linwood, UK  
www.williamtraceygroup.com  
**INVESTMENT FOCUS:**  
M&A Acquirer

**Wirsol Solar AG**  
Waghäusel, Germany  
www.wirsol.de  
**INVESTMENT FOCUS:**  
Project sponsor

**X**

**Xylem Inc.**  
Rye Brook, NY, USA  
www.xyleminc.com  
**INVESTMENT FOCUS:**  
M&A Acquirer