

# John Laing Environmental Assets Group

## Diverse renewables exposure

Since its launch in March 2014, John Laing Environmental Assets Group (JLEN) has built up a diverse portfolio of wind, solar, anaerobic digestion, waste and wastewater projects. It uses most of the revenue from these to pay an attractive yield (currently 5.9%) and the balance goes to reinvest in new projects, to help maintain the long-term value of the portfolio in real terms. JLEN is targeting an IRR between 7.5% and 8.5% (net of fees and expenses) on its £1 issue price over the long-term.

## Progressive dividend from investment in environmental infrastructure assets

JLEN aims to provide its shareholders with a sustainable dividend, paid quarterly, that increases progressively in line with inflation, and to preserve the capital value of its portfolio on a real basis over the long term. It invests in environmental infrastructure assets with predictable, wholly or partially index-linked cash flows supported by long-term contracts or stable regulatory frameworks.

Environmental infrastructure comprises projects that utilise natural or waste resources or support more environmentally-friendly approaches to economic activity. This could involve the generation of renewable energy (including solar, wind, hydropower and biomass technologies), the supply and treatment of water, the treatment and processing of waste, and projects that promote energy efficiency.

Period ended	Share price total return (%)	NAV total return (%)	Earnings per share (pence)	Dividend per share (pence)
31/03/15*	12.6	6.4	5.85	6.00
31/03/16	(2.5)	3.1	3.01	6.054
31/03/17	16.8	8.9	9.31	6.14

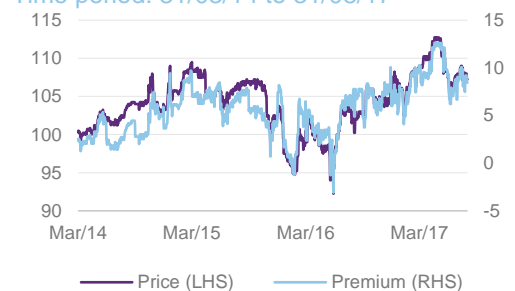
Source: Morningstar, Marten & Co. \*period from launch 31 March 2014

<b>Sector</b>	Renewable infrastructure
<b>Ticker</b>	JLEN LN
<b>Base currency</b>	GBP
<b>Price</b>	107.0
<b>NAV</b>	100.0p
<b>Premium/(discount)</b>	7.0%
<b>Yield</b>	5.9%

\*as at 30 June 2017, Morningstar estimate is 98.89p

## Share price & premium/(disc.)

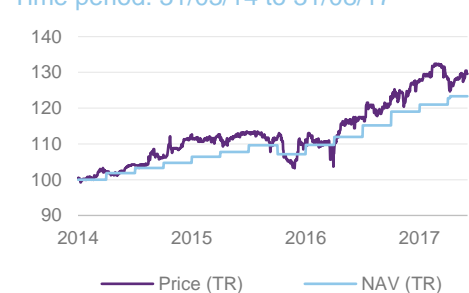
Time period: 31/03/14 to 31/08/17



Source: Morningstar, Marten & Co

## Performance since inception

Time period: 31/03/14 to 31/08/17



Source: Morningstar, Marten & Co

<b>Domicile</b>	Guernsey
<b>Inception date</b>	31 March 2014
<b>Adviser</b>	John Laing Capital Management
<b>Market cap (GBP)</b>	405m
<b>Shares outstanding</b>	378.5m
<b>Daily vol. (1-yr. avg.)</b>	643,649 shares
<b>Net gearing</b>	Nil

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## Introducing JLEN

Renewable energy (including solar, wind, hydropower and biomass technologies), the supply and treatment of water, the treatment and processing of waste, and projects that promote energy efficiency. JLEN doesn't invest in new or experimental technology.

You can access the company's website at [www.jlen.com](http://www.jlen.com)

Cash used to fund dividend and maintain capital base

John Laing Environmental Assets Group (JLEN) invests, through a subsidiary, John Laing Environmental Assets Group (UK) Limited (UK Holdco), in infrastructure projects that utilise natural or waste resources or support more environmentally-friendly approaches to economic activity. This could involve the generation of renewable energy (including solar, wind, hydropower and biomass technologies), the supply and treatment of water, the treatment and processing of waste, and projects that promote energy efficiency. It is aiming to build a portfolio that is diversified both geographically and by type of environmental asset. This emphasis on diversification helps differentiate JLEN from its peers which tend to specialise in solar or wind.

Reflecting its objective of delivering sustainable, inflation-linked dividends and preserving its capital, JLEN doesn't invest in new or experimental technology. A substantial proportion of its revenues are derived from long-term government subsidies.

JLEN's projects generate cash that JLEN uses to fund its dividend while reinvesting the balance in new assets to maintain its capital base. As the UK government has cut subsidies, the number of new projects under construction, particularly in solar, has declined but there is a considerable pool of existing projects that may become available for sale, there are opportunities in other OECD countries and John Laing Group (JLG) has a sizeable pipeline of projects that it could offer to JLEN under a formal agreement which gives JLEN the right of first offer when JLG is looking to sell environmental infrastructure assets (see page 13). The market for environmental infrastructure assets is fragmented and assets are not homogeneous. A large part of the efforts of the advisory team are focused on seeking out suitable opportunities and due diligence.

### Advisory team

Chris Tanner taking on sole lead responsibility for the fund

JLEN is advised by John Laing Capital Management (JLCM or the advisers), a subsidiary of JLG. The team was headed up, until recently, by David Hardy and Chris Tanner. On 19 May 2017, JLEN announced that David Hardy would be moving to take up the lead advisor role at John Laing Infrastructure Fund (JLIF), which is also advised by JLCM. There is no overlap between the two funds. Chris Tanner, who has over 15 years' experience of investing in this area and has been joint head of the team since JLEN was launched, will take lead responsibility for the fund and a process is underway to recruit a replacement for David.

Chris joined JLCM in January 2014. Prior to this, Chris was a principal in Henderson's private equity infrastructure team, often working closely with John Laing on a range of special projects, including the buying of investments in environmental infrastructure, as well as corporate refinancing and valuations. For the 18 months prior to joining the advisers he was on secondment to JLG, focused on renewable energy business as corporate finance director. Before joining Henderson in 2007, Chris worked at PricewaterhouseCoopers for 11 years including seven years in the infrastructure concessions team, where he focused on project finance advisory for both public and private sector clients, covering a wide range of projects with a strong focus on the waste sector.

He is assisted by Jane Tang (investment director) and Muxin Ma (senior investment manager), both of whom have extensive experience in the PPP and environmental infrastructure marketplace, and Gaby Amiel (asset manager) who is responsible for operations strategy for JLEN's wind and solar projects.

## The renewables market

JLEN's portfolio is focused currently on solar and wind power generation, and waste and wastewater treatment

JLEN's portfolio is focused currently on solar and wind power generation, anaerobic digestion, and waste and wastewater treatment. The advisers see scope for the inclusion of other technologies, including biomass and energy from waste projects at some point in the short-to-medium term.

Over the past couple of decades, we have been waking up to the need to protect our environment and tackle climate change and now we are starting to achieve meaningful results. Governments around the globe signed up to the Kyoto Protocol in 1997 with the aim of curbing the production of greenhouse gases but, initially, progress was slow. The UK agreed to a renewable energy target of 15% of energy consumption by 2020 (in 2005 this was just 1.5% according to the Department of Energy and Climate Change). The Scottish government opted for a target of 20% (in-line with the EU). In 2015, the UK government admitted that it might not meet its 2020 target but the shortfall is in the transport and heat elements of the target, not power generation where great change has been achieved.

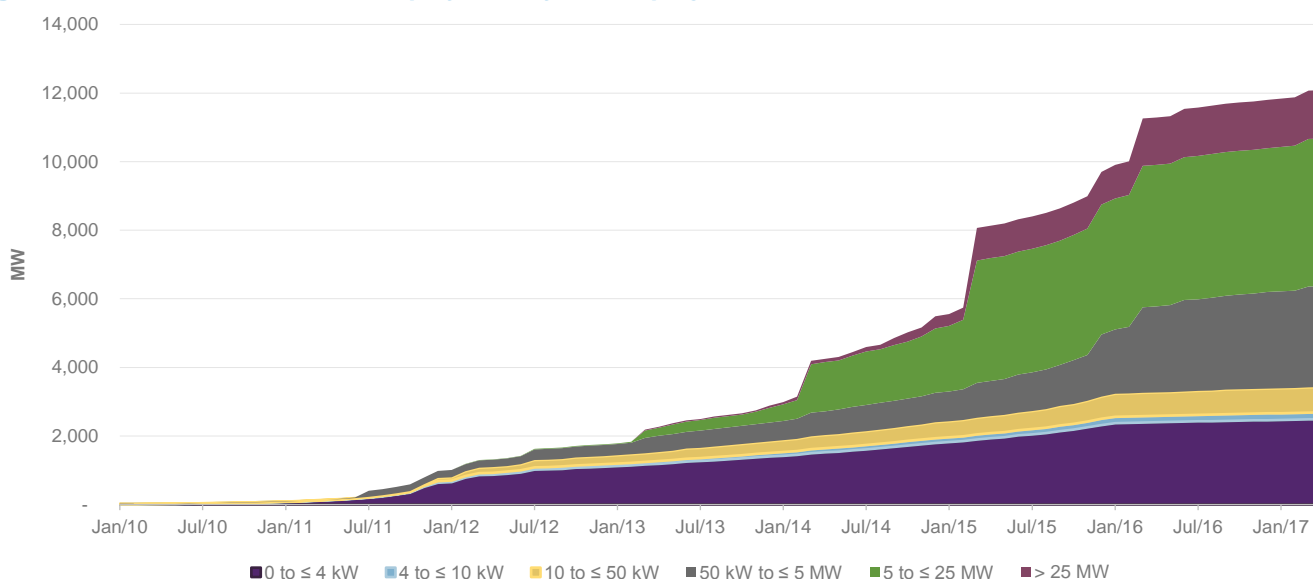
There are over 6,300 onshore wind turbines in the UK and this is the leading technology for the generation of electricity from renewable sources

The leading technology for the generation of electricity from renewable sources in the UK is on-shore wind. In 2016, this sector contributed 21TWh to generation in the UK, or a quarter of all renewable energy production (this was despite relatively low wind speeds in 2016). RenewableUK reckons that there are now in excess of 6,300 onshore wind turbines distributed over more than 1,250 projects. The proliferation of onshore wind turbines has met with some resistance, however. The UK government has removed all forms of subsidy for new onshore wind farms from 2016 and has tightened the planning process governing the approval of new onshore wind farms.

A subsidy increase in 2009 drove a sharp growth in new solar power projects

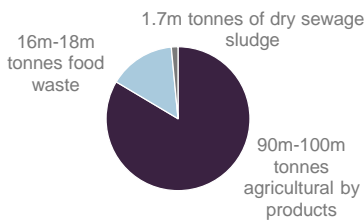
In 2009 subsidies for solar power production were increased in the UK and this market took off; so fast in fact that the subsidies were cut repeatedly over successive years and therefore growth in new projects may tail off sharply from here. JLEN says that opportunities still remain to expand its portfolio, as there are a number of projects being completed under transitional arrangements, and there is a healthy secondary market in existing projects. There is a similar story in the onshore wind market. The chart in Figure 1 shows the growth in solar power production capacity in the UK since 2010. Small scale installations accounted for the bulk of production capacity before 2013.

Figure 1: UK cumulative solar PV deployment by size of project



Source: Department for Business, Energy, & Industrial Strategy

**Figure 2: Anaerobic digestion feedstock sources**



Source: NNFCC

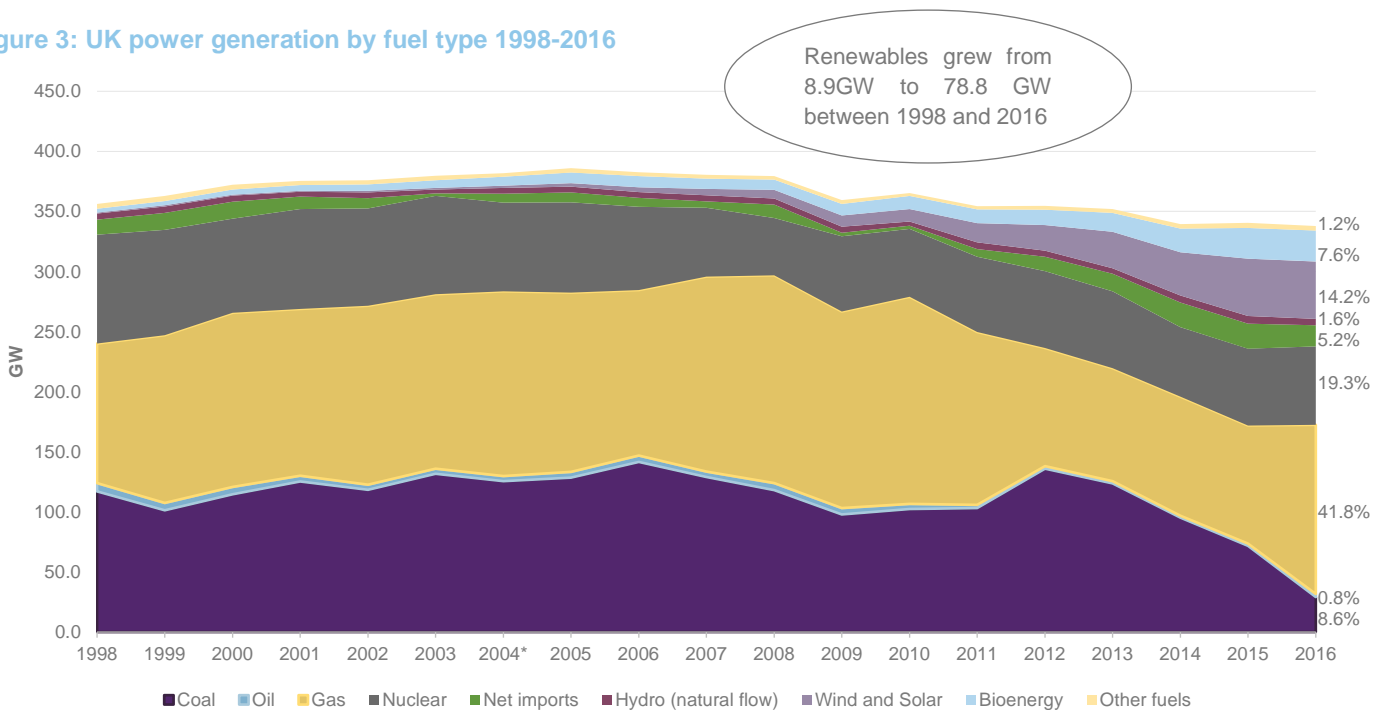
Anaerobic digestion is a bacterial process that takes place in the absence of oxygen that converts biomass (animal waste, food waste and crops, for example) into biogas, carbon dioxide and biofertiliser. Once the biogas has been upgraded, biomethane can be fed straight into the UK’s natural gas pipeline network or burned in a power station to produce power and heat.

The National Non-Food Crops Centre (NNFCC) estimate that the UK produces over 100m tonnes of organic material that could be used as feedstock for anaerobic digestion. It says that one tonne of food waste can produce about 300kWh of energy. Its data suggest that a tonne of animal slurry is lower yielding and a tonne of purpose-grown crops is higher yielding. It also says that processing all the UK’s food waste with anaerobic digestion would produce enough electricity for 350,000 homes. Sending this material to landfill could result in the methane escaping into the atmosphere, which is worrying from a climate change point of view as methane absorbs much more heat than CO<sub>2</sub>.

**The future lies with wind, solar and waste**

Figure 3 shows how the fuel mix of the UK’s energy generation has changed since 1998. The stark decline of coal (analysts, Carbon Brief, said that wind power production overtook coal power in 2016, contributing 11.5% of UK electricity against 9.2% for coal), the reliance on gas and the slow shrinkage of nuclear (where there are also question marks over new stations) are all evident. The interconnectors with EU power generators (notably French nuclear) have become more important. However, there is a question mark over the future of power imports post Brexit. Hydroelectric power is important but there is little scope for continued growth here. Biomass has become much more important following the conversion of Drax power station to run on imported wood pellets but the station’s green credentials have been questioned. The future seems to lie with renewable energy. The case for this is strengthened given the advances in battery technology which might help smooth the intermittent weather-related variations in solar and wind production.

**Figure 3: UK power generation by fuel type 1998-2016**



Source: Department for Business, Energy & Industrial Strategy

Two thirds of the prices underpinning revenues are stable and predictable

## Revenue

JLEN's wind and solar assets generate revenue both from sales of electricity and from subsidies. The prices of over two thirds of revenues are stable and predictable. While electricity prices fluctuate with the market, revenues from green benefits and PFI payments are underpinned by stable and predictable prices. The revenue mix at the end of March 2017 was 32% from electricity sales, 53% from green benefits and 15% under PFI contracts.

Subsidy regime

## Subsidies

The subsidy regime in the UK has evolved over the years as new priorities have been emphasised by government. The subsidies are index-linked (to RPI).

**Renewables Obligation Certificates (ROCs)** were one of the main mechanisms for the provision of subsidies to new renewable energy projects between April 2002 and March 2017. Electricity suppliers either bought ROCs from generators each year or paid a price per MWh set by the government who, in turn, passed the proceeds to the generators. All new projects got 1 ROC per MWh between 2002 and 2008 but, since then, the number of ROCs attached to a project has varied by type of generation. The intention was to encourage the development of certain forms of generation over others. For example, hydroelectric schemes attracted, routinely, lower subsidies than offshore wind. The subsidies are paid for 20 years from the date of the commissioning of the project. Solar projects generating more than 5MW ceased to attract ROCs from April 2015 (although projects with planning permissions at that time were 'grandfathered' into the scheme). Similarly, the scheme was terminated early, in April 2016, for on-shore wind projects.

**Non Fossil Fuel Obligations** were the precursor to ROCs. Renewable energy supplies attracted a technology specific premium to the pool price. The subsidies were funded by the Non-Fossil Fuel Levy.

The **Feed-in-tariff (FIT)** scheme is still in force. This is only available for projects producing less than 5MW. New projects attract a subsidy per kWh for electricity produced. The overall cost of new accreditations under the FIT scheme to the government has been capped however. Pre-2012 FITs are paid for 25 years and 20 years post 1 August 2012. These subsidies are index-linked.

Subsidies are still available for some renewable energy generation technologies that the government wants to encourage. These take the form of **contracts for difference (CfD)s**. Currently, these apply to offshore wind, wave and tidal stream power, advanced waste conversion technologies, anaerobic digestion, biomass with combined heat and power (CHP) and geothermal power. No CfD projects feature in JLEN's portfolio to date although they may in the future.

Figure 4 shows CfD prices as published in March 2017. The budget for these is limited so that projects attracting lower CfD prices are more likely to be successful in securing subsidies.

Figure 4: CfD strike prices (in £/MWh in 2012 prices)

Heading	Projects completing in 2021/22	Projects completing in 2022/23
Offshore wind	105	100
Advanced conversion technologies (with or without CHP)	125	115
Anaerobic digestion (with or without CHP) greater than 5MW	140	135
Dedicated biomass with CHP	115	115
Wave	310	300
Tidal stream	300	295
Geothermal (with or without CHP)	140	140

Source: Department for Business, Energy, & Industrial Strategy

French subsidies are funded by a levy on consumers

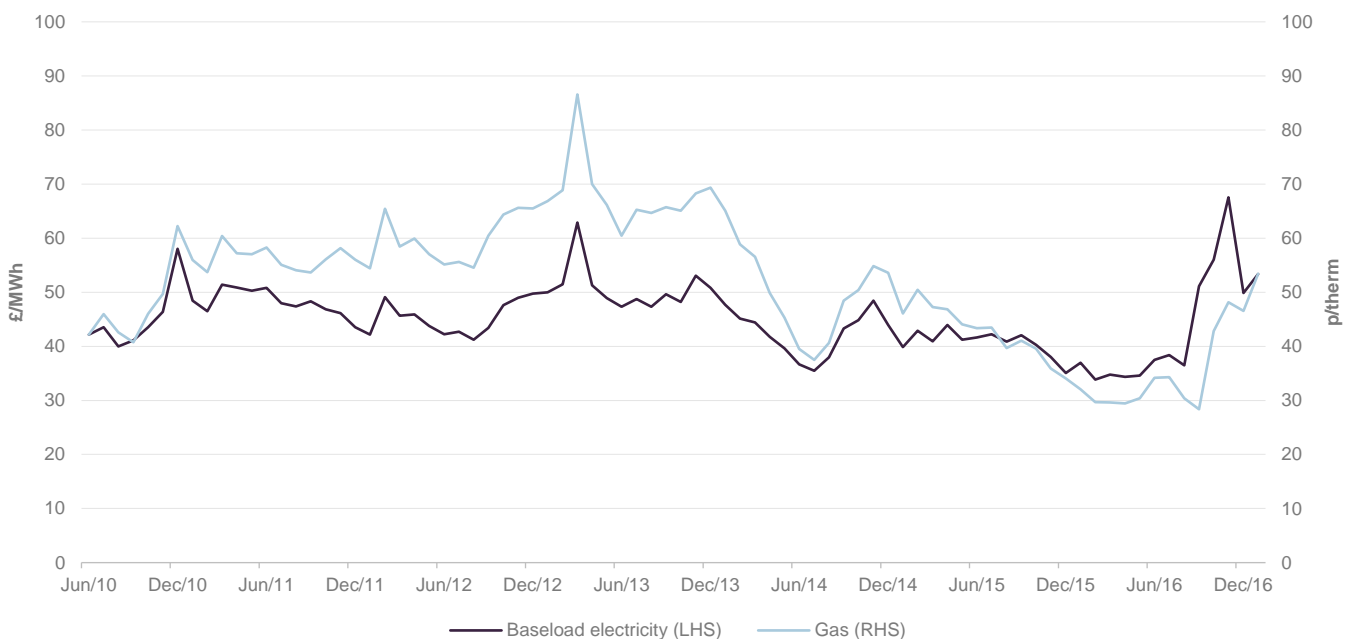
The French system is based on Feed in tariffs. In France, wind production can be sold at fixed prices which include an element of subsidy derived from a levy on power purchases by consumers. For wind projects commissioned since 2006, for the first 10 years the power purchase agreement is set at 82€/MWh (indexed to inflation). For the remaining five-year period, the subsidy varies by output.

Solar FITs vary by the date the power purchase agreement is signed, the type of installation and the project's production capacity.

### Electricity sales

Electricity produced by JLEN's projects is sold through power purchase agreements (PPA) either at fixed prices or based on prevailing spot prices (prices are set every half hour). Since gas plants tend to set the price of electricity, gas prices have a direct impact on electricity prices.

Figure 5: Baseload electricity prices versus gas prices in the UK



Source: Ofgem

For some years, power prices were declining in line with falling gas prices. This changed in the summer of 2016 however, in part as a result of sterling weakness in the

wake of the EU referendum. Although power prices are off their November 2016 peak, they are higher than they have been.

The chart in Figure 5 shows figures for baseload electricity prices. Typically, these apply to stations that take a long time to fire up and shut down such as nuclear and coal fired stations. The grid also needs stations that can adapt rapidly to fluctuations in demand, 'peaking plant'. Their output can achieve higher prices. Some forms of renewable energy can operate like baseload but the unpredictable nature of wind and solar power production means that, if they are operating in the spot market, they have to take whatever the prevailing price is.

JLEN's wind and solar renewable assets are all connected to regional electricity distribution networks rather than the national transmission network that larger power plants are typically connected to. This means that, in general, JLEN's assets are generating electricity closer to consumers of that electricity on the same distribution networks, and that carries a range of small financial benefits for electricity suppliers who do not otherwise have to make use of the transmission network. The electricity suppliers pass a proportion of these back to the generator through the PPA. These 'embedded benefits' are location dependent, and can typically range from £1-£5/MWh. They can be subject to change as Ofgem reviews the basis for receiving them periodically to ensure that they are consistent with the desired development of the electricity network as a whole.

A typical solar plant gets two thirds of its revenues from sources that do not face a price risk. For an onshore wind farm this is 50%-55%

JLEN provided some examples in its December 2016 prospectus that illustrate the combined effects of subsidies and power sales on revenues. The advisers suggest that a typical onshore wind farm with 0.9 ROCs and receiving wholesale electricity revenues according to prevailing market prices will receive around 45%-50% of its revenue from the sale of power, a similar amount from the ROC buy-out price, and the balance from the ROC recycle price and embedded benefits. A solar PV plant receiving 2 ROCs/MWh receives approximately twice as much revenue from ROCs than from the sale of power, while a pre-2012 solar FIT project will receive approximately 85% of its revenues from the FIT.

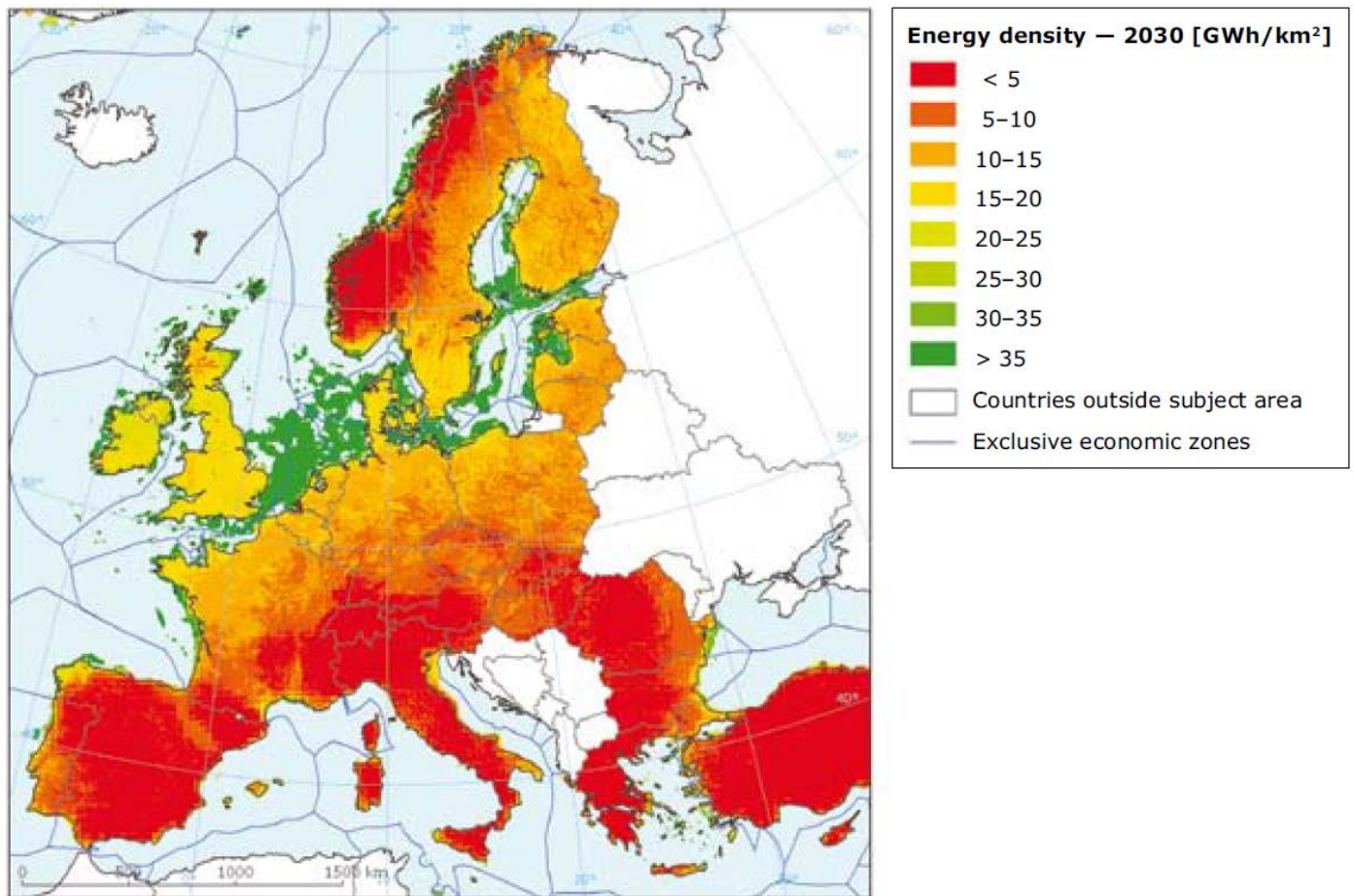
The UK gets some of the highest average wind speeds in Europe as is evidenced in Figure 6. Nevertheless, these are variable (see page 17).

Wind variance of 11% from the mean 90% of the time and 7% for solar

Revenue from sales of electricity from JLEN's wind farms varies according to wind conditions and, likewise, revenue from solar plants varies according to solar irradiation levels. JLEN say that, based on historical analysis, the variance in wind speeds is expected to be less than 11% from the mean 90% of the time. JLEN cite the example of 2010, when wind speeds were 10% less on average than long-term averages, as an illustration of the potential impact. The equivalent figure for solar is 7%.



Figure 6: European wind power potential



Source: European environment agency

### Anaerobic digestion revenues

Once the biogas that JLEN's anaerobic digestion plant produces has been upgraded into biomethane, it is sold at prevailing market prices for natural gas. The plant attracts a subsidy under the Non-Domestic Renewable Heat Incentive. Eligible installations receive quarterly payments over 20 years based on the amount of heat generated. The level of subsidy has varied over the years. For JLEN's scheme, the rate is £79 per MWhth (Megawatt hour thermal) adjusted in line with RPI. The plant also has a 0.5MWe CHP (Combined Heat and Power) engine which attracts a subsidy under the FIT regime.

### Water & waste revenues

In 2007, in response to EU directives on waste to landfill, the government set out an aggressive programme of tax increases designed to raise the cost of landfill while prioritising PFI/PPP projects designed to encourage recycling and incineration (for both power and heat). This helped create a number of potential investments for JLEN. However, the government is no longer creating new PFI/PPP projects (on the basis that it has more than met its targets for reduction in landfill volumes).

Waste and wastewater revenue varies by throughput

With waste and wastewater treatment projects, revenues tend to vary by throughput although contracts may be structured in such a way that handling a 'base load' of waste/wastewater provides the bulk of revenues.

The East London Waste Authority Waste and Dumfries and Galloway Waste projects in JLEN's portfolio both have guaranteed minimum tonnage levels, set in the contract, that cover the bulk of the projects' costs and margin. Cost and margin would be covered, in the case of the East London project, at 400,000 tonnes while the contract guarantees a level of 350,000 tonnes.

For Dumfries & Galloway, there is a guaranteed minimum payment based on 89% of modelled tonnage levels up to and including the contract year ending 2025 and 80% of modelled tonnage levels thereafter.

Revenues from the Tay Wastewater project are banded so that over 90% of revenues are earned on the first band. JLEN thinks that the volume of wastewater treated will exceed the first band under likely scenarios. As an example, in 2003, one of the driest years on record in the UK, volumes were 12% below long-term averages.

## Maintenance costs

Facilities management, operation and maintenance are all outsourced

The facilities management, operation and maintenance of JLEN's investments is subcontracted to a range of service providers. The life of these contracts varies considerably across the portfolio. For example, the operators for the waste and waste water projects are on whole life contracts whereas, for the other assets, these contracts can be considerably shorter.

Solar panels are guaranteed for 25 years by their manufacturers. Wind turbine contracts have product guarantees that typically cover the cost of replacing a faulty part. Operators will provide JLEN with compensation where output has fallen as a result of poor performance, insurance cover is available for lost output.

The turbines are warranted to have a 20-year life and should continue beyond this, although this is affected by location and usage. Some problems, such as grid connection failures, are JLEN's problem however. They had one instance at Monksham, for example, where a lightning strike took out production for six-to-eight weeks. Insurance is in place to cover material damage, third parties and business interruption. In the case of the Monksham lightning strike, this covered substantially all of the costs and losses.

There is a portfolio effect whereby the advisers can negotiate lower maintenance costs and insurance costs for a collection of assets as compared to a single asset.

## Valuation

NAVs are based on discounted cash flows

JLEN publishes NAVs on a quarterly basis based on valuations prepared by the investment adviser. These are approved by the board prior to publication. There is no publicly quoted price for the projects that JLEN invests in and so the projects are valued on the basis of discounting the cash flows over the life of the project at a rate that reflects what market evidence is available for project pricing. At the year end, an independent specialist will advise the board on the suitability of the discount rate, amongst other things. The weighted average discount rate as at end March 2017 was 8.2%.

The asset lives for the wind and solar assets are estimated to be 25 years.

Forecasts of electricity output are based on long-term models and use a central base case of the amount of electricity that is expected to be generated by each project 50% of the time. They have to build possible outages into the model – they assume that wind

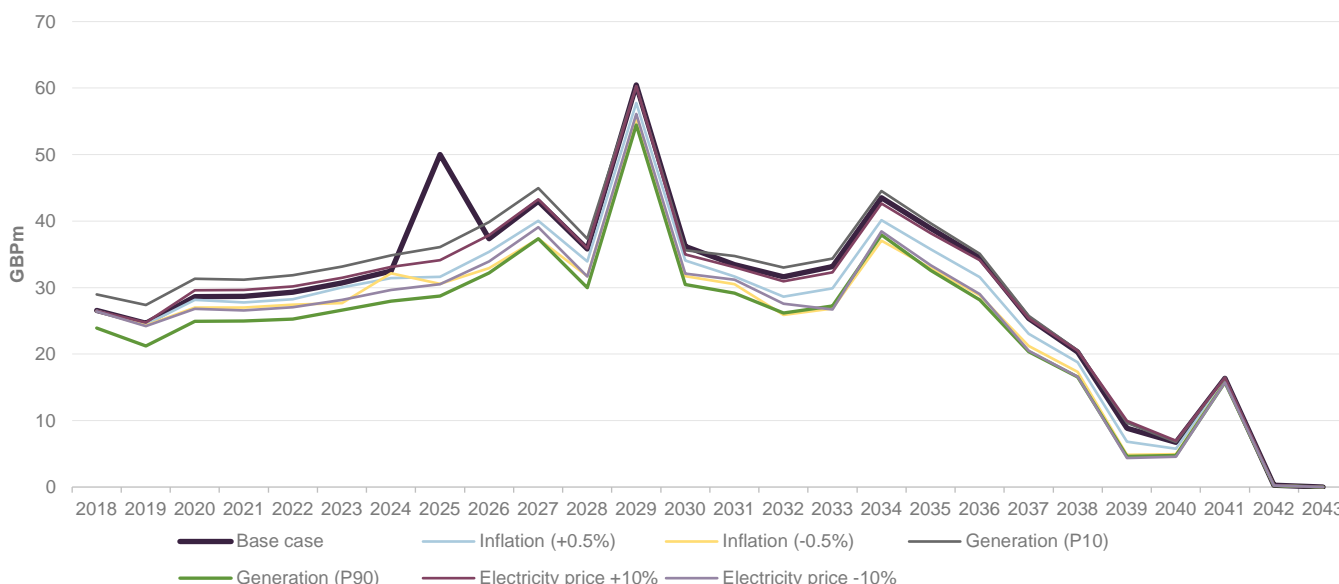
projects are available for production 97.7% of the time and solar projects are available 98.9% of the time.

Electricity prices are modelled based on fixed price agreements or, where these do not exist, forecast prices. For the first two years JLCM use market rates to forecast prices, where fixed price arrangements are not in place. For periods beyond two years it uses long-term forecasts supplied by an external consultant as adjusted for project-specific arrangements.

Forecasts of waste and wastewater volumes are based on the client’s own projections where available and independent studies where appropriate.

Prevailing tax rates are used. It also has to take into account inflation projections. In March 2017, their inflation assumptions were set at 3.7% for 2017, 3.3% for 2018 and 2.75% per annum thereafter for the UK and 1.5% per annum for France.

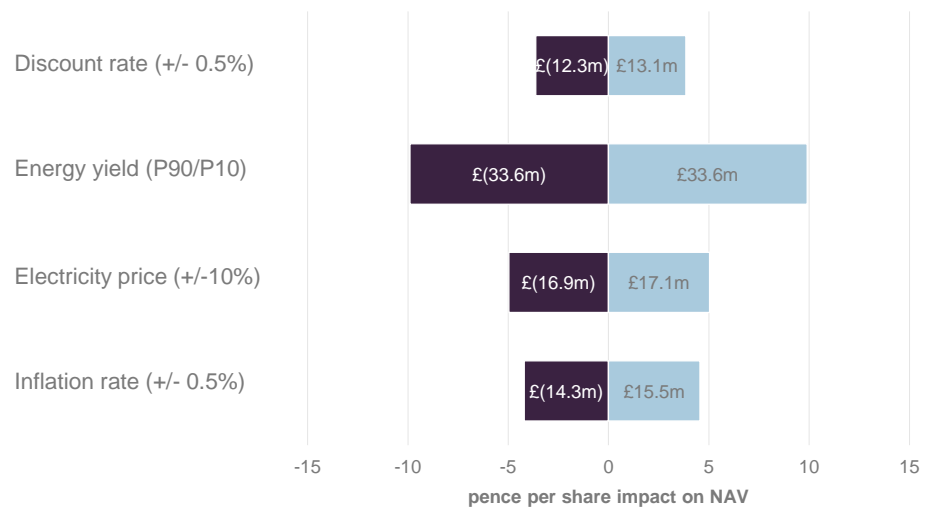
Figure 7: Forecast cashflows and variances (excluding reinvestment) as at end September 2016



Source: JLEN, as at end September 2016 (before Moel Moelogan, Plouguernevel and Vulcan Renewables deals)

Figure 7 shows JLEN’s forecast cashflows based on the above assumptions and Figure 8 shows how the NAV might move given various scenarios. ‘P90’ and ‘P10’ against the electricity yields show the impact if electricity yields moved to 10% off their worst and highest assumptions respectively. It is important to point out that the figures in Figure 7 show aggregate cashflows and variances for the projects that were in the portfolio at the end of September 2016. It takes no account of the surplus cash flows that are available for reinvestment once dividends have been paid or the deals that have been completed since September 2016.

Figure 8: NAV sensitivity to various factors



Source: JLEN, as at end March 2017

## Investment process

£345m pipeline of assets potentially available from John Laing Group

In March 2017, JLEN estimated that it had a pipeline of £345m worth of assets potentially available to it from JLG between then and December 2019. The first offer agreement between JLEN and JLG is explained below.

The advisers have also built up good working relationships with other developers and there is no restriction on purchasing assets from outside the John Laing Group. The advisers aim to maintain the diverse nature of the portfolio. The approach is a cautious one. Although JLEN can invest across all OECD countries, to date investments have focused on the UK and, more recently, France. The advisers say they are unlikely to have a scattering of projects across a number of countries, preferring to concentrate on countries and regulatory/subsidy regimes that they know well or where they have relationships with established partners. Some opportunities are brought to them for appraisal by specialist consultancy firms operating in the area.

Prices are negotiated at arms-length and reflect the advisers' assessment of the potential risks and rewards from each project. This includes a review of the project's capital structure. The target is that returns from projects cover JLEN overheads and dividends to investors, and generate an element of surplus for reinvestment.

### Investment restrictions

- No more than 15% of the portfolio to be invested in assets under construction or that are not yet operational.
- At least 50% invested in the UK and the balance invested in other OECD countries.
- No new investment to exceed 30% of NAV (or 25% of NAV based on the acquisition price, taking the value of existing assets into consideration).

John Laing Group and JLEN have a first offer agreement between them

### First offer agreement

JLEN has a first offer agreement (which runs to February 2018 and then is a rolling one-year contract) with JLG whereby it may acquire assets that JLG wishes to sell. The agreement is a right of first offer for relevant investment interest in environmental infrastructure projects within the EU and EFTA that are consistent with JLEN's investment policy. JLEN will only proceed with an offer that passes its due diligence and where it feels the price is commensurate with the risks involved. To deal with potential conflicts of interest when buying from JLG, distinct committees, separated by 'Chinese walls', are established to deal with purchases and sales of assets. Independent valuers report on fair market values. The independent directors have to approve each transaction.

The day-to-day facilities management, operations and maintenance of the projects is contracted to third parties

### Ongoing management

The day-to-day facilities management, operations and maintenance of the projects is contracted to third parties and part of the adviser's role is overseeing these arrangements, including approving payments.

### Disposals

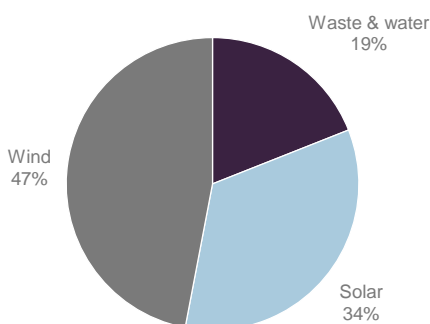
JLEN usually holds its assets for the long-term and no disposals have been made to date. It may however sell assets when the advisers feel the sale price justifies it or when there are other valid reasons for doing so. The directors may choose to return the proceeds of disposals to investors but may reinvest them.

### Hedging

When they invest in assets in currencies other than sterling, the advisers may choose to hedge the currency exposure back to sterling. The advisers may also hedge interest rate risk and inflation risk. All hedging is at the board's discretion.

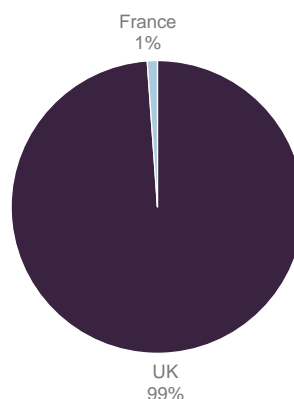
## Asset allocation

Figure 9: JLEN portfolio by type as at 31 March 2017



Source: JLEN, Marten & Co

Figure 10: JLEN portfolio by location as at 31 March 2017



Source: JLEN, Marten & Co

The portfolio comprises investments in 24 projects. Figures 9 and 10 show how the portfolio was distributed by asset type and geography at the end of March 2017, before

the acquisition of Moel Moelogan wind farm, the four ground mounted solar plants, the CSGH portfolio comprising, Crug Mawr, Golden Hill, Higher Tregarne and Shoals Hook, and Vulcan Renewables. 68% of the portfolio's revenues were inflation-linked at the end of March 2017 and 53% of revenues were derived from subsidies (32% exposed to electricity prices).

## Solar

The solar portfolio comprises a number of projects. Amber operates across two locations, Branden operates across three locations and CSGH operates across four locations. Panther is a portfolio of smaller rooftop and ground mounted schemes scattered across the UK mainland. 1,033 of these are domestic installations, 52 are at farms and 14 are school rooftops. All are 100% owned except Monksham where the original Enterprise Investment Scheme investors have a 13% interest in the economics of the project.

Figure 11: JLEN's solar portfolio

Project	Location	Ownership	Capacity (MW)	Commenced	End of project life	Subsidy type
Amber (Five Oaks)	West Sussex	100%	4.8	July 2012	2036	FIT
Amber (Fryingdown)	Hampshire	100%	5.0	July 2012	2036	FIT
Branden (Luxulyan)	St Austell, Cornwall	100%	3.0	March 2013	2037	2 ROCs
Branden (Treddinick)	St Austell, Cornwall	100%	5.8	March 2013	2037	2 ROCs
Branden (Victoria)	St Austell, Cornwall	100%	5.9	March 2013	2037	2 ROCs
CSGH (Crug Mawr)	South Wales	100%	7.5	March 2015	2042	1.4 ROCs
CSGH (Golden Hill)	South Wales	100%	6.3	March 2015	2041	1.4 ROCs
CSGH (Higher Tregarne)	Cornwall	100%	4.9	March 2014	2040	1.6 ROCs
CSGH (Shoals Hook)	South Wales	100%	14.8	March 2015	2041	1.4 ROCs
Monksham	Frome, Somerset	87%*	10.7	March 2014	2039	1.6 ROCs
Panther	Various UK	100%	6.5	Various	2036/2039	FIT
Pylle Southern	Shepton Mallet, Somerset	100%	5.0	December 2015	2040	FIT

Source: JLEN, Marten & Co. \*combined generation capacity of 28.5MW

## Wind farms

Figure 12: JLEN's wind portfolio

Project	Location	Ownership	Capacity (MW)	Commenced	End of project life	Subsidy type
Bilsthorpe	Nottinghamshire	100%	10.2	March 2013	2038	1 ROC
Burton Wold extension	Burton Latimer, Northamptonshire	100%	14.4	September 2014	2039	0.9 ROC
Carscreugh	Dumfries & Galloway	100%	15.3	June 2014	2038	0.9 ROC
Castle Pill	Milford Haven	100%	3.2	October 2009	2034	1 ROC
Dungavel	South Lanarkshire	100%	26.0	October 2015	2039	0.9 ROC
Ferndale	Rhondda Valley	100%	6.4	September 2011	2037	1 ROC
Hall Farm	Routh, East Yorkshire	100%	24.6	April 2013	2037	1 ROC
Le Placis Vert	Saint Gounéo, Brittany	100%	4.0	January 2016	2040	FIT
Moel Moelogan	Llanrwst, Conwy	100%	14.3	2003/2008		1 ROC
New Albion	Kettering, Northamptonshire	100%	14.4	January 2016	2040	0.9 ROC
Plouguernevel	Brittany	100%	4.0	May 2016	2041	FIT
Wear Point	Pembrokeshire	100%	8.2	June 2014	2039	0.9 ROC

Source: JLEN, Marten & Co

The wind portfolio is located predominantly in the UK with two small wind farms in Brittany, France. The UK wind farms, with the exception of Moel Moelogan, are held through JLEAG Wind, which in turn is a 100% subsidiary of JLEAG Wind Holdco which in turn is owned by UK HoldCo.

JLEAG Wind is financed with a non-recourse portfolio debt facility. The outstanding balance at 30 September 2016, adjusted for the inclusion of the Dungavel and New Albion debt at that date (but excluding Moel Moelogan which was financed by UK Holdco's revolving credit facility), was £118.1m. Interest rate hedging through a long-term step-up swap was put in place at completion.

## ■ Anaerobic Digestion

On 29 August 2017, JLEN announced the acquisition of Vulcan Renewables, an anaerobic digestion plant at Hatfield Woodhouse near Doncaster. The vendors were VCTs managed by Downing LLP. The plant has been operational since October 2013. It has a capacity of 5MWth and predominantly produces biomethane, which is sold as gas into the grid. The plant also has a 0.5MWe CHP engine. The plant attracts subsidies under the FIT and Non-Domestic Renewable Heat Incentive schemes, both of which are inflation-linked.

## ■ Waste

### Dumfries & Galloway

- JLEN, through its subsidiaries, owns 80% of the equity and 100% of the shareholder loans in Shanks Dumfries & Galloway Holdings, a subsidiary of which has a PFI concession to process municipal waste until 2029. The other 20% of the equity is owned by Renewy (formerly Shanks PFI Investments Limited). The sites have been operational since 2007.
- They operate a Mechanical Biological Treatment (MBT) plant, together with a number of other associated facilities including a transfer station and composting plant. The MBT plant produces solid recoverable fuel (SRF) as well as other recyclable items.
- Revenue is linked to the weight of waste processed. There is a guaranteed minimum tonnage (89% of target until 2025 and 80% thereafter), which underpins the project's revenues.
- The Dumfries & Galloway waste project was financed by a long term £25.2m non-recourse project finance debt facility in 2008 and this is amortising so that the final repayment is due in September 2025. The balance outstanding as at 30 September 2016 was £18.7 million. The loan principal is hedged via an interest rate swap expiring in March 2025.

### East London Waste Authority

- The project is based in East London and processes waste from the East London Waste Authority (ELWA) which is responsible for the disposal of the waste from the four London Boroughs of Redbridge, Barking and Dagenham, Havering and Newham. The PFI concession agreement runs until 2027. Again, Renewy has a 20% equity stake in the project holding company.
- The sites became operational in 2006 and 2007. Waste processing is performed through a combination of facilities constructed and developed as part of the project, the largest of which are two MBT facilities which treat approximately 360,000 tonnes of residual waste per annum and, as before, produce SRF and other recyclable material.

- The ELWA Waste project also involves the operation of four refurbished Re-use and Recycling Centre sites and two Materials Recycling Facilities, one for material rejected from the Re-use and Recycling Centres and the other processing recyclable material that has been separated from household waste. In total, the facilities are capable of processing 700,000 tonnes of waste per annum.
- The ELWA Waste project is financed by a long term £110m non-recourse debt facility, of which £95.2 million was drawn down, following completion of the facilities, in Q2 2008. Repayment commenced in September 2008 and final repayment is due in March 2026. The balance outstanding as at 30 September 2016 was £64.8 million. The loan principal is hedged via an interest rate swap expiring in September 2025.
- Again, revenue is based on the weight of waste processed, with the ELWA SPV's costs and margin covered from revenues relating to tonnage up to 400,000 and a guaranteed minimum tonnage of 350,000 tonnes. Renewy is the operator and it is required to source third party waste to process if ELWA waste is forecast to be below 420,000 tonnes, JLEN says that waste flows have not fallen below 400,000 tonnes per annum since the ELWA Waste project has been operational.
- ELWA's Frog Island MBT facility attracted headlines when it caught fire in August 2014. Operationally, the project was able to adapt waste processing and insurance covered the cost of rebuilding the facility. The project was fully restored in August 2016 and JLEN's NAV was unaffected.

## Water

### Tay Wastewater

- The Tay Wastewater project services a 700-hectare area between Dundee and Arbroath, at the mouth of the Tay estuary, in East Scotland under a PFI concession agreement which runs until 2029. JLEN has a one third stake in the project's holding company.
- The Tay SPV's physical assets comprise 35km of pipeline, seven pumping stations and a wastewater treatment plant at Hatton.
- The project receives an index-linked tariff from Scottish Water based on the volume of wastewater treated and the quality of sludge and effluent produced by the treatment process. Since January 2009, a revised banded tariff structure has been applied which ensures that the majority of the Tay SPV's revenues are earned at relatively low volume levels, thus reducing the impact to project revenues from variability in wastewater flow volumes.
- The secured debt comprises privately placed £103.3 million 7.12% non-recourse secured bonds due in 2028. The outstanding balance at 30 September 2016 was £66.1 million.

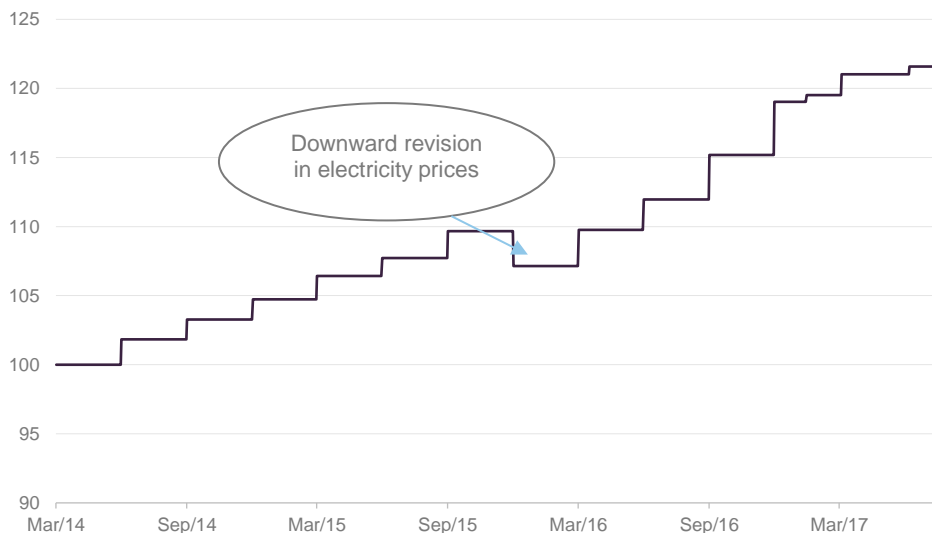
## Potential acquisitions

JLEN's December 2016 prospectus listed a number of assets owned by JLG which might be eligible for its portfolio. To date, the only acquisitions since the prospectus was published have been the Moel Moelogan wind farms, the four CSGH solar projects, Crug Mawr, Golden Hill, Higher Tregarne and Shoals Hook, and Vulcan Renewables. All of these were acquired from third parties. The list included a range of potential investments including biomass CHP plants, wind farms in the UK, France, Ireland, Sweden and Germany. The advisers also highlighted a healthy level of third party opportunities.



## Performance

Figure 13: JLEN NAV total return performance since launch rebased to 100



Source: Morningstar, Marten & Co

Over the fund's fairly short life span, performance has been held back by low power prices and subsidy changes

Since launch, JLEN has been held back to an extent by changes in power prices, which fell for much of the period (see Figure 5). This is a problem that has affected all similar funds. However, as discussed on page 7, power prices have picked up from recent lows. At the valuation point in March 2017, JLEN adjusted its long-term electricity price assumptions, increasing them by 6.9% on a time-weighted basis (over 25 years). Market forward prices over the next two years rose by almost 25% to an average of €45/MWh for winter and €40/MWh for summer. JLEN has responded to higher short-term prices by fixing prices under existing power purchase agreements for up to two years. At the end of March 2017, 88% of their electricity exposure in the renewables portfolio was fixed for summer 2017 at €39/MWh on average and 40% was fixed for winter 2017 at €41/MWh on average.

Small hit from unseasonably low wind speeds in Q4 2016 may have reversed in Q1 2017

JLEN has reported that the final quarter of 2016 saw particularly low and unseasonal wind speeds across the UK. This meant that generation across the wind portfolio was about 25% below expectations in that quarter (the previous couple of quarters had been in-line with budget). The net impact on the NAV was 0.4p per share. The situation reversed in Q1 2017 when wind speeds were higher than usual. Over the year to 31 March 2017, electricity generated by the wind portfolio was 15% below budget.

On a normalised basis, electricity generation from their solar assets was 5% below budget for the year ended 31 March 2017. Solar assets performed in-line with budget in Q4 2016 but solar irradiation was lower than averages in the summer of 2016. In addition, Branden experienced some technical issues and Monksham was hit by a lightning strike, 75% of the park was generating electricity by the end of September but it did not come back into full operation until December 2016. These two events reduced electricity production by a further 7%. Insurance covered substantially all of the costs and losses associated with the Monksham strike. Events such as these underscore the attractions of having a diversified portfolio of assets.

These negatives have been masked by the uptick in power prices in H2 2016, however.

Wastewater volumes were below budget following a dry winter although this had little impact on revenue given the banded payment mechanism. Frog Island resumed full operations in August 2016 (see page 16).

## Peer group

JLEN's asset mix makes it stand out from its peers

You can access up-to-date information on the peer group at [www.quoteddata.com](http://www.quoteddata.com)

JLEN sits within the AIC's renewable energy sector alongside six other funds. There are some differences between the funds. JLEN is the only fund in this peer group to incorporate environmental infrastructure assets such as anaerobic digestion, water and waste projects within its portfolio. Bluefield, Foresight and NextEnergy are all pure solar plays while Greencoat UK Wind and Greencoat Renewables are focused exclusively on wind at present. The Renewables Infrastructure Group (TRIG) holds both solar and wind projects. JLEN's more diverse portfolio aims to smooth returns to investors.

Figure 14 compares the performance of the funds (excluding Greencoat Renewables, which is a recent entrant to the sector) while Figure 15 highlights some of the key differences between them. To a large extent, variations in performance between the funds reflects differences in the asset mix. The closest fund to JLEN, in that it has both wind and solar assets, is TRIG. Only JLEN has environmental infrastructure elements to its portfolio. We would caveat the performance analysis below by pointing out that the sector is relatively young (the first fund to launch, Greencoat UK Wind, pre-dates JLEN by a year). It may be too early in the life of these funds to make any valid conclusions from this analysis. JLEN would argue that, over time, the extra level of diversification offered by its portfolio should help smooth returns.

Figure 14: NAV total return peer group performance over periods ending 31 August 2017

Heading	3 months (%)	6 months (%)	1 year (%)	3 years (%)	Since 31/03/14 (%)
<b>JLEN</b>	1.9	3.6	10.2	21.1	23.3
Bluefield Solar	0.0	-0.8	11.4	22.8	32.4
Foresight Solar	0.8	0.5	10.3	21.2	26.7
Greencoat UK Wind	1.5	4.2	11.6	26.1	29.8
NextEnergy Solar	0.2	4.0	11.5	23.3	n/a
TRIG	4.5	4.5	11.4	21.4	25.4
Peer group average	1.4	2.5	11.2	23.0	28.6

Source: Morningstar, Marten & Co

Figure 15 shows that JLEN is the smallest fund in the peer group. Size does have an impact on running costs (as a fund grows its fixed costs are spread over a larger base) and this helps explain JLEN's higher than average ongoing charges ratio. (NB this was calculated before its February 2017 fund raise). Each of the funds in the peer group trades at a decent premium to net asset value, reflecting investors' desire for yield from assets with a low correlation to equity markets. The yields are all fairly similar except for Bluefield Solar which has a policy of paying out almost all of its net revenue without making new investments.

Figure 15: peer group comparative data as at 4 September 2017

Heading	Market cap (GBPm)	Premium (%)	Yield (%)	Ongoing charge	Average valuation discount rate (%)
<b>JLEN</b>	405	7.0	5.9	1.46	8.2
Bluefield Solar	414	10.1	6.5	1.24	8.3
Foresight Solar	455	6.8	5.7	1.16	7.5
Greencoat UK Wind	899	12.7	5.3	1.37	8.0/9.0
NextEnergy Solar	646	10.9	5.7	1.28	7.9
TRIG	1,022	8.9	5.9	1.09	8.4

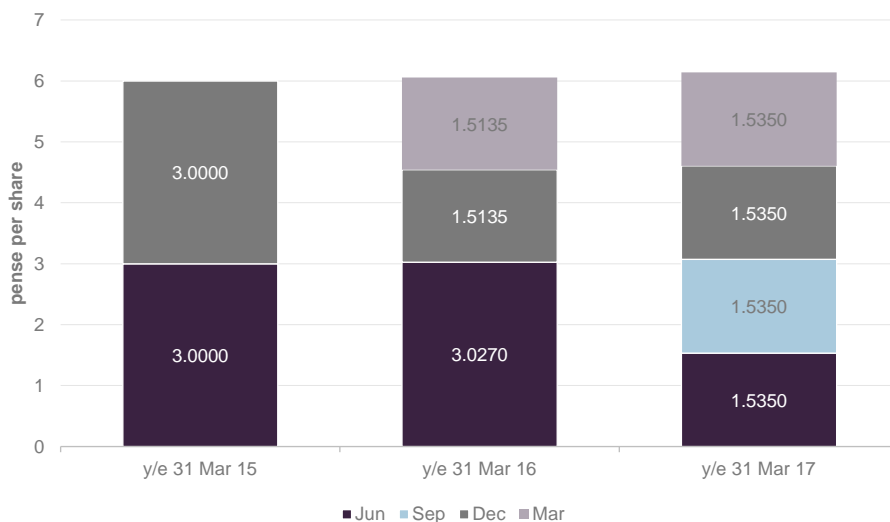
Source: Morningstar, Marten & Co

## Dividend

6.14p dividend target for year ended 31 March 2017

At launch in 2014, JLEN targeted an annualised dividend of 6.0p in its initial year. The aim each year is to increase the dividend in line with inflation. Figure 15 shows all the dividends declared since launch. As you can see, the fund switched from paying semi-annual dividends to quarterly dividends with effect from March 2016. For the year to 31 March 2017 JLEN declared dividends totalling 6.14p. For the year ended 31 March 2018, JLEN is targeting a dividend of 6.31p. Dividends are expected to be paid quarterly, normally in June, September, December and March.

Figure 16: JLEN dividends declared or forecast to be declared since launch



Source: JLEN

## Premium

Figure 17: JLEN premium/(discount) since launch



Source: Morningstar, Marten & Co

Range of discount control features including a discount triggered discontinuation vote

Since launch, JLEN has traded at an average premium of 5.7%. Over the past year, it has traded between a discount of 3.1%, for a short period post-Brexit, and a premium of 11.4%.

If needed, JLEN has powers to repurchase its shares into treasury. These would only be reissued at a premium to net asset value. JLEN would consider using tender offers to control its discount if necessary. In addition, if, on average, the shares traded at a discount of 10% or greater over its financial year, JLEN's board would propose a resolution at the next AGM that the company ceases to continue.

Tiered management fee, no performance fee

## Fees and costs

As highlighted on page 18, JLEN's ongoing charges ratio is 1.46%. The advisers get a base fee of 1% on the first £500m of adjusted portfolio value and 0.8% on the balance. Their contract runs until March 2018 from when it can be terminated on one year's notice. There is no performance fee.

Administration services are provided by Praxis Fund Services Limited in exchange for a fee which ranges from £65,000 if the NAV is £250,000,000 or less, to £75,000 if the NAV is greater than £250,000,000 and up to £450,000,000 and £80,000 if the NAV is greater than £450,000,000. Plus £500 per annum for its services in relation to its compliance with FATCA, and additional fees for its services in relation to the reporting obligations under the AIFM Directive (which vary according to the number of EEA States in which the company is required to comply with reporting obligations under the AIFM Directive as a result of its marketing activities).

## Capital structure and life

JLEN is domiciled in Guernsey and listed on the main market of the London Stock Exchange. It invests through a subsidiary, John Laing Environmental Assets Group (UK) Limited (UK Holdco) in which it may own both equity and loan notes.

JLEN has 378,477,029 ordinary shares in issue and no other classes of share capital. Under a placing programme that commenced in December 2016 and runs until 15 December 2017, JLEN can issue up to 150m new shares. 55m shares were issued under the placing programme in February 2017 and a further £40m placing in July has been used to repay the company's revolving credit facility. Unissued shares cannot be issued at a price less than the NAV plus a premium to reflect the costs associated with the issue.

JLEN has an indefinite life but continuation votes may be triggered if its shares trade at a discount for a prolonged period of time (see Premium on page 19). The company's financial year end is 31 March and, typically, AGMs are held in August.

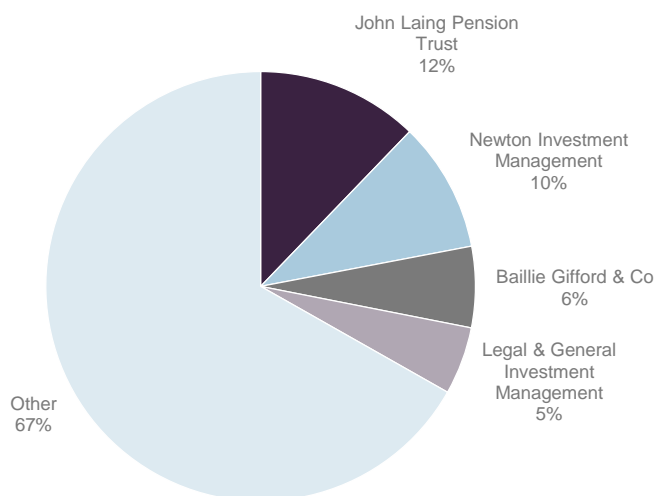
## Gearing

Gearing is permitted at the fund level up to a maximum of 30% of net assets. Gearing is provided by a £130m multi-currency revolving credit facility with a margin above LIBOR (or, in respect of loans denominated in Euros only, EURIBOR) of 2.00%-2.25% depending on JLEN's loan-to-value ratio. Interest rate risk is hedged out using swaps.

In addition to the revolving credit facility, the stable, predictable cashflows generated by the underlying projects make it easier to borrow money secured against them. At the project level, JLEN is constrained to a maximum 65% gearing on gross project value for renewable energy generation projects and maximum 85% gearing on gross project value for PFI/PPP type projects. Actual project gearing is much lower than this. At the end of March 2017, project-level gearing across the whole portfolio was 42.9%. Within this, project-level gearing in the renewable energy projects was 32.7% and in the PFI processing assets 59.8%. This finance is non-recourse to the fund.

## Major shareholders

Figure 18: Major shareholders as at 31 March 2017



Source: JLEN

## Board

The five directors are all non-executive and independent of the adviser. They all took up their positions on the launch of the fund. The bill for the total remuneration and benefits in kind payable to the directors is capped at £300,000 per annum.

**Richard Morse**, the chairman, is a partner at Opus Corporate Finance where he heads the environmental practice. He was head of the utilities and energy team at Dresdner Kleinwort Wasserstein, before taking up senior roles in the energy and utilities practices at Goldman Sachs and Greenhill International, and a senior adviser role at Matrix Corporate Capital. He has boardroom experience of Bazalgette Tunnel Limited, Woodard Corporation, Private Infrastructure Development Group, and Howard de Walden Estates Limited. Richard has previously been Deputy Director General of Ofgem and a senior adviser to the Department of Energy and Climate Change (DECC).

**Christopher Legge** worked for Ernst & Young in Guernsey from 1983 to 2003, was its head of Audit and Accountancy from 1990 to 1998 and was appointed managing partner in 1998. Since his retirement from Ernst & Young, Chris has held a number of non-executive directorships in the financial services sector. He is a Fellow of the Institute of Chartered Accountants in England and Wales.

**Denise Mileham** was previously an executive director of Kleinwort Benson (Channel Islands) Fund Services, where she acted as head of fund administration and deputy head of fund services (which included custody). She has also had roles at Close Fund Services, Barclaytrust and Credit Suisse, where she undertook a number of roles, including compliance officer in the fund administration department. She has been a Fellow of the Securities and Investment Institute since 2006 and is also a member of the Institute of Directors, the Guernsey NED Forum and the Guernsey Investment Fund Association and has sat on their Technical Committee.

**Peter Neville** has more than 36 years' experience in the financial services and financial services regulatory sectors, in the UK and overseas, being director general of the Guernsey Financial Services Commission from 2001 until 2009. He currently holds a number of non-executive directorships. He was a non-executive director of Mytrah Energy Limited and a member of the board and chairman of the Audit and Risk Committee of the Channel Islands Competition and Regulatory Authorities ("CICRA"). He was involved in establishing the Investment Management Regulatory Organisation in the UK, and established the Maltese regulatory regime for funds and investment management firms. Peter is a Fellow of the Institute of Chartered Accountants in England and Wales.

**Richard Ramsay** is a chartered accountant with considerable experience of the energy sector and the closed end fund industry. His energy sector experience includes: leading the Barclays de Zoete Wedd team that privatised the Scottish electricity industry; a period at Ofgem as Managing Director Finance and Regulation; and working as director of the Shareholder Executive, principally involved with government businesses in the nuclear sector. He currently chairs Northcourt, a managing agency focused on the global nuclear insurance market. He has been a director of two investment trusts and one venture capital trust and is currently chairman of Seneca Global Income & Growth Trust (which is also a client of Marten & Co).

Figure 19: The Board

Director	Role	Appointed	Age*	Fees†	Shareholding*
<b>Richard Morse</b>	Chairman	12/12/13	57	62,700	83,042
<b>Christopher Legge</b>	Chairman of Audit Committee	12/12/13	61	37,000	29,896
<b>Denise Mileham</b>	Chairman of Nomination Committee	12/12/13	67	37,000	28,160
<b>Peter Neville</b>	Chairman of Risk Committee	12/12/13	70	37,000	29,896
<b>Richard Ramsay</b>	Director	12/12/13	67	47,300	53,813

Source: Marten & Co, \* as at March 2017, † fees proposed for 2017/18 financial year

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