AARDVARK
Certification Ltd.

JLEN Wind Portfolio

CO_2 Analysis Report

April 2019

Prepared for: John Laing Environmental Assets Group Ltd

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Executive Summary

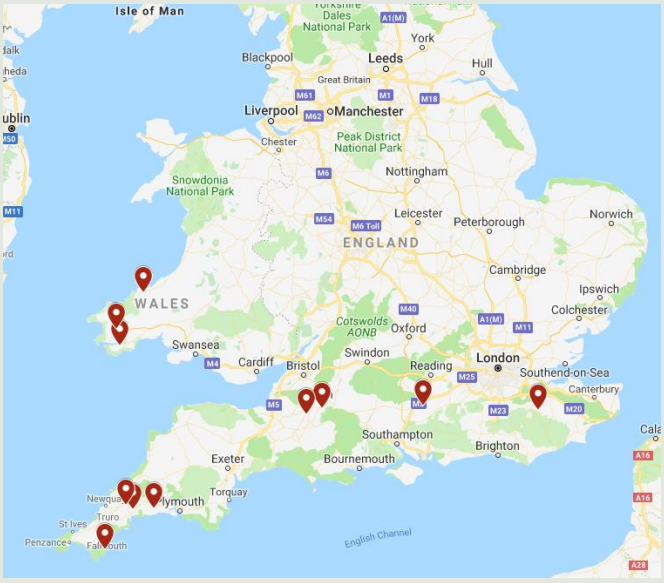
Aardvark Certification Ltd (ACL) has been instructed by John Laing Environmental Assets Group Ltd to assess and report against the carbon savings achieved across their wind turbine portfolio. The portfolio consists of a total of 12 UK based assets, each comprised of either single turbines or multiple turbine installations. The total installed capacity of the JLEN wind portfolio amounts to 169MW with assets distributed across the country.

Asset Introduction

The JLEN Wind Turbine Portfolio is widely distributed across the UK with up to 50% of turbines in Scotland. JLEN hold a 100% stake in all of the wind assets they have invested in. The wind assets are accredited to either the ROC or FiT schemes and all are managed under service contracts with O&M providers.

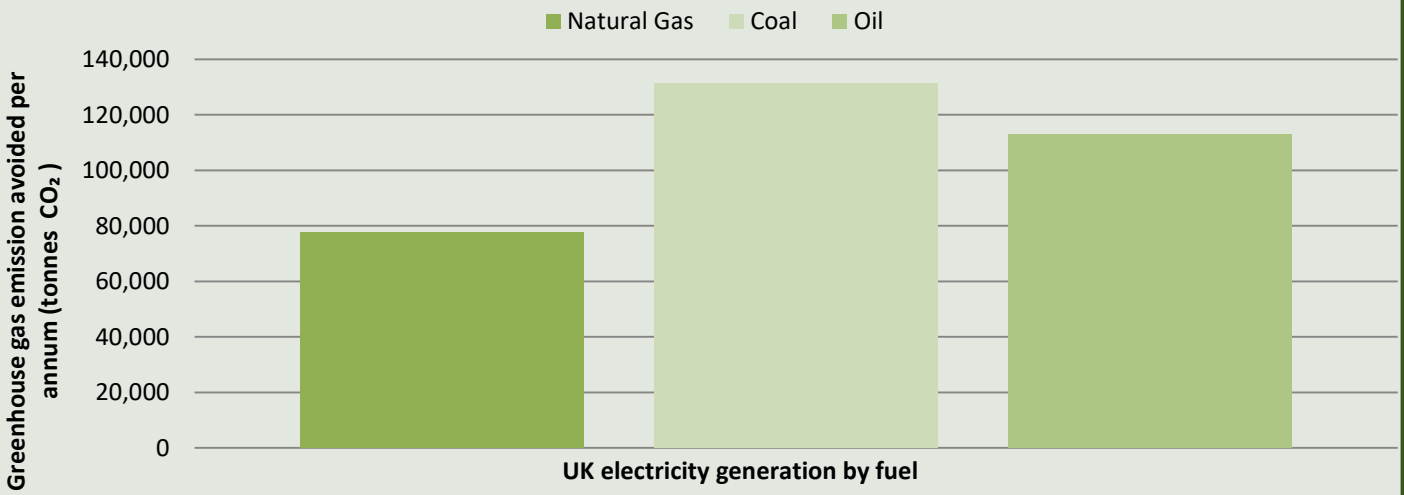
The wind portfolio has produced a total 1,701,226 MWh of electricity to date. During the course of the portfolio's total lifetime it is anticipated that up to 10,407,306 MWh will be produced.

The renewable energy generated by the wind is 100% renewable energy and avoids CO_2 emissions which would have otherwise been produced by fossil fuel derived electricity generation.



CO_2 Savings

Using the energy generation data from the wind portfolio, we are able to calculate the quantity of CO_2 that has been avoided had the JLEN Wind Portfolios average annual electricity production (421,769 MWh) been produced by conventional fossil fuel sources.



GHG Emissions Avoided		
Fuel Type	***Average Annual (tonnes CO_2e)***	***Lifetime Saving (tonnes CO_2e)***
Natural Gas	77,589	1,914,528
Coal	131,221	3,237,921
Oil	113,165	2,792,384

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Energy Production

As there are no green house gas emissions associated with the operational phase of a wind turbine, the renewable energy produced by the JLEN Wind Portfolio avoids 100% of the equivalent fossil fuel derived energy.

		Electricity			t CO_2e			
Asset Name	Installed Capacity (MWh)	Generation to date MWh	Avg Annual Generation MWh	Forecast generation MWh	Emissions avoided to date	Avg annual emissions avoided	Lifetime emissions avoided	Forecast emissions avoided
Bilsthorp	10.2	108,222	19,695	387,335	30,634	5,575	140,277	109,643
CREPL	15.3	158,053	33,532	651,080	44,740	9,492	229,041	184,301
Hall Farm	24.6	270,563	47,833	920,785	76,588	13,540	337,235	260,647
Wear Point	8.2	111,748	24,947	509,335	31,633	7,062	175,810	144,177
Burton Wold	14.4	202,289	46,942	970,135	57,262	13,288	331,878	274,616
New Albion	14.4	78,327	25,796	543,866	22,172	7,302	176,124	153,952
Dungavel	26.0	276,321	84,255	1,832,546	78,218	23,850	596,957	518,739
MM1	2.6	38,778	6,545	129,809	10,977	1,853	47,722	36,745
MM2	11.7	198,647	33,108	629,052	56,231	9,372	234,297	178,066
Castle Pill - EWT	3.2	39,657	6,610	104,108	11,226	1,871	40,695	29,470
Ferndale	6.4	91,055	15,509	244,267	25,775	4,390	94,920	69,145
Llynfi	24.0	127,566	76,997	1,783,764	36,110	21,796	541,040	504,930

What do these savings mean?

The forecast CO_2 savings the JLEN Wind Turbine Portfolio will achieve over its lifetime can be difficult to fully appreciate when stated in tonnes. We therefore convert these figures to real-life equivalents to assist the reader in interpreting the reporting. For the Wind portfolio, the above figures equate to:

- removing the combined emissions of 54,097 medium sized diesel cars every year from UK roads for the lifetime of the asset portfolio.
- Power 113,105 residential properties based upon the national average electricity consumption statistics.
- Provide enough power to drive a Nissan Leaf 1,240,497,059 miles a year – equivalent to driving 49,817 times around the circumference of the earth
- Boil enough water for 73,810,000,000 cups of tea

CO_2 Forecast

Based on the quantity of electricity the wind portfolio produces each year, an average of 119,390 tonnes CO_2e per annum will be avoided compared to the emissions associated with electricity produced for the UK Grid. It is expected that during the course of the wind portfolios remaining operational life, a further 2,464,430 tonnes CO_2e will be saved.

Other Emissions to Air Avoided

In addition to avoiding CO_2 emissions, other greenhouse gas emissions are also avoided including CH4 and N_2O. Based on the amount of electricity produced by the JLEN Wind Portfolio per annum, emissions of these gasses which have been avoided have been calculated and shown below. These values are included in the total CO_2 equivalent values used within this report.

CO_2e of CH_4 emissions avoided kg/yr	CO_2e of N_2O emissions avoided kg/yr
278,368	645,307

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Community Benefits

As well as the various environmental benefits the JLEN Wind portfolio delivers, the majority of individual assets also contribute directly to their respective local communities. The individual renewable energy schemes have in the last year contributed £330,847 to local community funds managed by local parish councils or foundations with ongoing commitments to donate to these funds over the lifetime of the projects. The funding is index linked ensuring that it won't diminish with inflation and will continue to make a meaningful contribution at a local community level. The projects the funds are allocated to are for the betterment of the local community with preference for projects which promote sustainability.

A summary of individual asset community funding for the last payment year is shown below:

Asset	Amount		Recipient
Llynfi Afan	£	96,000	Cymmer and Gwynfi (Neath Port Talbot) & Blaengarw and Caerau (Bridgend)
BL Wind	£	14,573	Northamptonshire Community Foundation
New Albion	£	33,521	Northamptonshire Community Foundation
Dungavel	£	71,281	South Lanarkshire Renewable Energy Fund
Bilsthorpe	£	15,000	split between Eakring and Bilsthorpe Parish Councils
Hall farm	£	39,520	East Riding of Yorkshire Council
Carscreugh	£	41,952	Fund administered by Foundation Scotland
MM2	£	19,000	Conwy County Borough Council
Total	**£**	**330,847**	

Methodology

This report has been prepared in good faith by Aardvark Certification Ltd based on data obtained from the owner/operator of the asset reviewed. Our calculations of CO2 savings are based on IFI Approach to GHG Accounting for Renewable Energy Projects. Baseline Emission Factors used in this analysis are taken directly from the Department for Business, Energy & Industrial Strategy Greenhouse gas reporting: conversion factors 2018.

Liability

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