

Panther Solar Portfolio CO₂ Analysis Report

March 2019

Panther Solar Portfolio

CO₂ Analysis Report

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 by their 6.47MW solar portfolio which consists of a total of 1,099 individual domestic rooftop solar installations. This assessment considers the CO₂ savings made as a result of the solar portfolio's energy production and export to the grid.

Asset Introduction

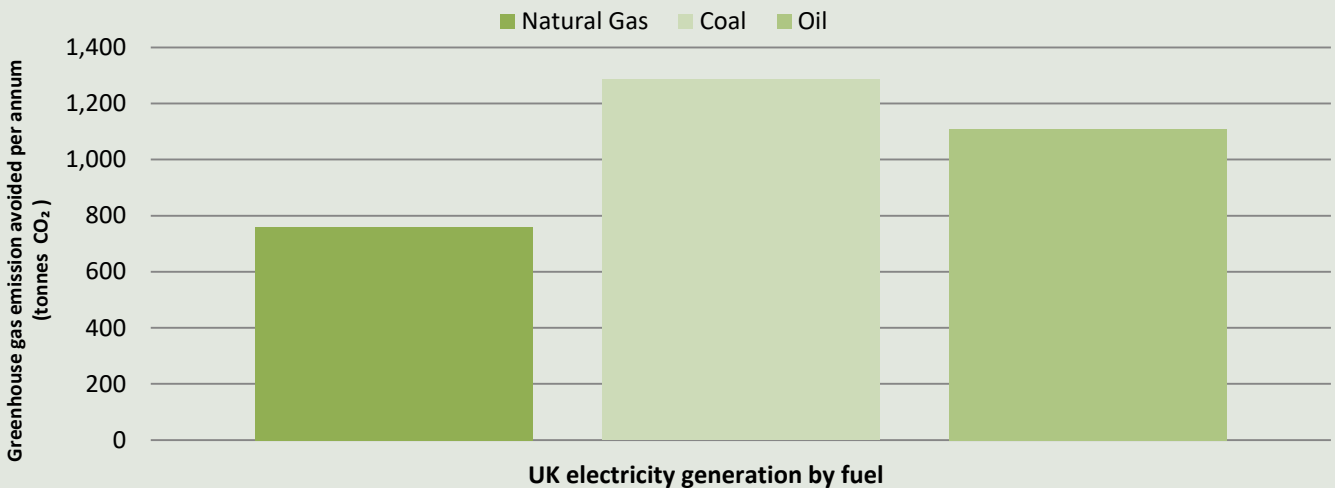
The Panther Solar Portfolio comprises of an array of ground mounted solar panels giving a total installed capacity of 6.47MW. Each year an average of 4,131MWh of renewable electricity has been produced. Since commissioning in January 2012 2015 the solar portfolio has produced 28,943MWh of electricity. During the course of the installations total lifetime it is anticipated that up to 99,747MWh will be produced.

The renewable energy generated by the solar portfolio is fed directly into the grid via the transformer. The grid management system converts the current generated by the generator into an AC current according the requirements and standards given by the local utilities operator.



CO₂ Savings

The preceding summary of energy generation from the solar portfolio enables illustration of the quantities of CO₂ that have been avoided had the Panther Solar Portfolios annual electricity production (4,131MWh) been produced by conventional fossil fuel sources.



GHG Emissions Avoided

Fuel Type	Average Annual (tonnes CO ₂ e)	Lifetime Saving (tonnes CO ₂ e)
Natural Gas	760	18,349
Coal	1,285	26,763
Oil	1,108	31,033

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Energy Production

As there are no green house gas emissions associated with the operational phase of a solar portfolio, the renewable energy produced by the Panther Solar Portfolio offsets 100% of the equivalent fossil fuel derived energy.

Total Energy Produced (per annum)			UK Generated Electricity	Solar PV Generated Electricity
			0.28307	0.000
		Conversion factors		
Electricity	4,131,000	kWh	1,169,362	0.00
		CO₂ Equivalent (kg CO₂e)		
		CO₂ Difference (kg CO₂e)		1,169,362

What do these savings mean?

The forecast CO₂ savings the Panther Solar Portfolio will achieve over its lifetime is equivalent to:

- removing the combined emissions of 518 medium sized diesel cars every year from UK roads for the lifetime of the asset.
- Power 1,108 residential properties based upon the national average electricity consumption statistics.
- Provide enough power to drive a Nissan Leaf 12,150,000 million miles a year – equivalent to driving 488 times around the circumference of the earth
- Boil enough water for 723 million cups of tea

CO₂ Forecast

Based on the quantity of electricity the solar portfolio produces each year, an average of 1,169 tonnes CO₂e per annum will be offset compared to the emissions associated with electricity produced for the UK Grid. It is expected that during the course of the solar portfolios remaining 18 years of operational life, a further 20,042 tonnes CO₂e will be saved.

Other Emissions to Air Avoided

In addition to offsetting CO₂ emissions, other greenhouse gas emissions are also avoided including CH₄ and N₂O. Based on the amount of electricity produced by the Panther Solar Portfolio per annum, emissions of these gasses which have been avoided have been calculated and shown below.

CO ₂ e of CH ₄ emissions avoided kg/yr	CO ₂ e of N ₂ O emissions avoided kg/yr
2,726	6,320

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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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