

CSGH Shoals Hooks Solar Park

CO₂ Analysis Report

March 2019

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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 by their 14.78MW solar park located on Shoals Hook Farm, Haverfordwest, Pembrokeshire. This assessment considers the CO₂ savings made as a result of the solar park's energy production and export to the grid.

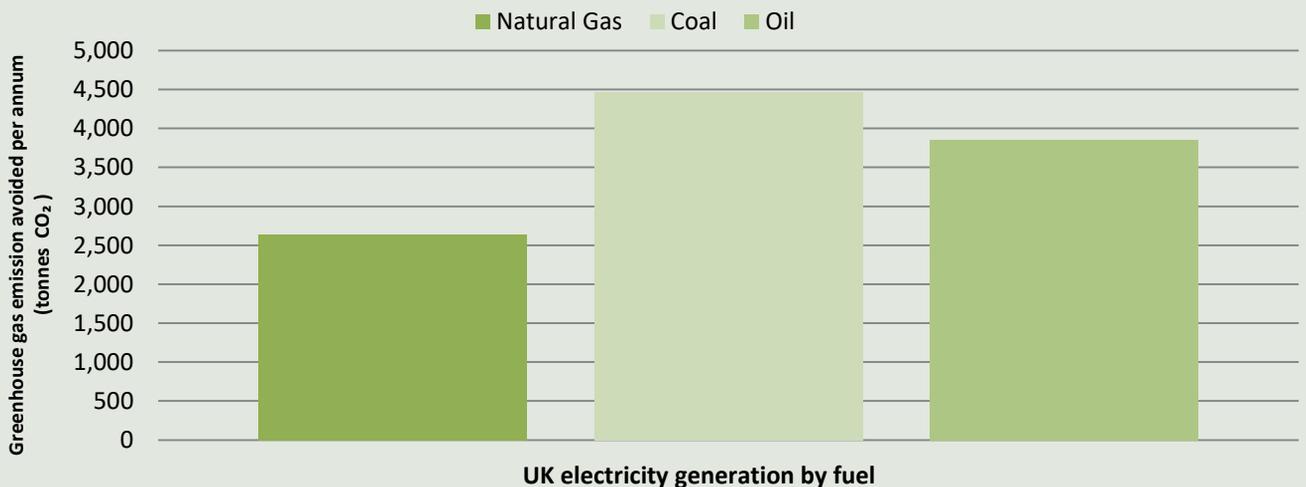
Asset Introduction

The Shoals Hooks Solar Park comprises of an array of ground mounted solar panels giving a total installed capacity of 14,78MW. Each year an average of 14,370MWh of renewable electricity has been produced. Since commissioning in March 2015 the solar park has produced 55,195MWh of electricity. During the course of the installations total lifetime it is anticipated that up to 303,317MWh will be produced. The renewable energy generated by the solar park 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 park enables illustration of the quantities of CO₂ that have been avoided had the Shoals Hooks solar parks annual electricity production (14,370MWh) 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	2,644	55,798
Coal	4,471	81,383
Oil	3,856	94,368

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Energy Production

As there are no green house gas emissions associated with the operational phase of a solar park, the renewable energy produced by the Shoals Hooks Solar Park 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
Electricity	14,370,000 kWh	4,067,716	0.00
	CO₂ Difference (kg CO₂e)		4,067,716

What do these savings mean?

The forecast CO₂ savings the Shoals Hooks Solar Park will achieve over its lifetime is equivalent to:

- removing the combined emissions of 1,577 medium sized diesel cars every year from UK roads for the lifetime of the asset.
- Power 3,854 residential properties based upon the national average electricity consumption statistics.
- Provide enough power to drive a Nissan Leaf 42,264,706 million miles a year – equivalent to driving 1,697 times around the circumference of the earth
- Boil enough water for 2,515 million cups of tea

CO₂ Forecast

Based on the quantity of electricity the solar park produces each year, an average of 4,068 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 parks remaining 21.2 years of operational life, a further 70,236 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 Shoals Hooks Solar Park 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
9,484	21,986

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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

This document contains information and may contain conclusions and recommendations. Every effort has been made to ensure that the information is accurate and that the opinions expressed are sound. However, Aardvark Certification Limited cannot be made liable for any errors or omissions or for any losses or consequential losses resulting from decisions based on the information.



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