

# CSGH Crug Mawr Solar Park CO<sub>2</sub> Analysis Report

March 2019

# Crug Mawr Solar Park

## CO<sub>2</sub> 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 7.5MW solar park located on Crugmore Farm, Penparc, Cardigan. This assessment considers the CO<sub>2</sub> savings made as a result of the solar park's energy production and export to the grid.

### Asset Introduction

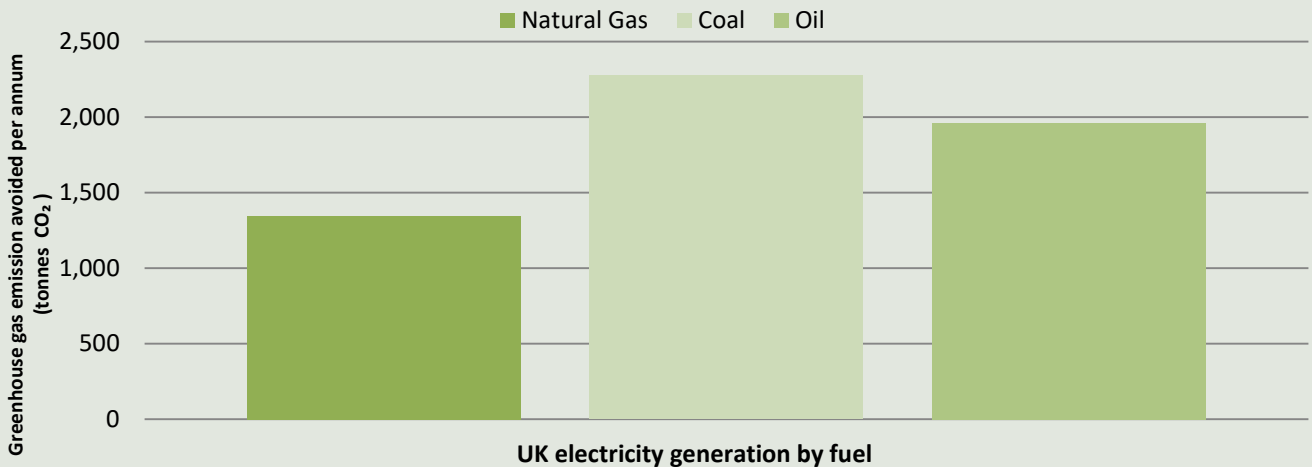
The Crug Mawr Solar Park comprises of an array of ground mounted solar panels giving a total installed capacity of 7.5MW. Each year an average of 7,317MWh of renewable electricity has been produced. Since commissioning in March 2015 the solar park has produced 28,106MWh of electricity. During the course of the installations total lifetime it is anticipated that up to 154,450MWh 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.



### CO<sub>2</sub> Savings

The preceding summary of energy generation from the solar park enables illustration of the quantities of CO<sub>2</sub> that have been avoided had the Crug Mawr solar parks annual electricity production (7,317MWh) been produced by conventional fossil fuel sources.



### GHG Emissions Avoided

Fuel Type	Average Annual (tonnes CO <sub>2</sub> e)	Lifetime Saving (tonnes CO <sub>2</sub> e)
Natural Gas	1,346	28,413
Coal	2,276	41,440
Oil	1,963	48,053

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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 Crug Mawr Solar Park offsets 100% of the equivalent fossil fuel derived energy.

Total Energy Produced (per annum)			UK Generated Electricity	Solar PV Generated Electricity
			<b>0.28307</b>	<b>0.000</b>
<b>Electricity</b>	<b>7,317,000</b>	<b>kWh</b>	<b>2,071,223</b>	<b>0.00</b>
			<b>2,071,223</b>	

### What do these savings mean?

The forecast CO<sub>2</sub> savings the Crug Mawr Solar Park will achieve over its lifetime is equivalent to:

- removing the combined emissions of 803 medium sized diesel cars every year from UK roads for the lifetime of the asset.
- Power 1,962 residential properties based upon the national average electricity consumption statistics.
- Provide enough power to drive a Nissan Leaf 21,520,588 million miles a year – equivalent to driving 864 times around the circumference of the earth
- Boil enough water for 1,280 million cups of tea

### CO<sub>2</sub> Forecast

Based on the quantity of electricity the solar park produces each year, an average of 2,071 tonnes CO<sub>2</sub>e 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 35,764 tonnes CO<sub>2</sub>e will be saved.

### Other Emissions to Air Avoided

In addition to offsetting CO<sub>2</sub> emissions, other greenhouse gas emissions are also avoided including CH<sub>4</sub> and N<sub>2</sub>O. Based on the amount of electricity produced by the Crug Mawr Solar Park per annum, emissions of these gasses which have been avoided have been calculated and shown below.

CO <sub>2</sub> e of CH <sub>4</sub> emissions avoided kg/yr	CO <sub>2</sub> e of N <sub>2</sub> O emissions avoided kg/yr
4,829	11,195

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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 CO<sub>2</sub> 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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