Response to :

Environmental statement. Volume 2 technical appendices Appendix 15-1 Greenhouse gas emissions assessment document reference EN010141/DR/6.2

Dear Mr Sword

I would be grateful if you would consider the points raised below, and take up the following specific points with the applicant as you see fit, in respect to the quoted Environmental Statement below.

AI has been used to identify and locate some information for this submission, not to write it.

Yours sincerely

Shaun Woodward – Resident - F95D3E8C6

Comments on Table 1 – Source of Equipment and Materials

1/. Mounting Structures
I note the mounting structures have been specified as **Engineering steel**. With a ICE database value of 1.58 to 1.74 kg CO_2e / kg

They will almost certainly be **Electrogalvanised steel,** as previously specified by the applicant, with an ICE database value of 2.45 to 2.79 kg CO_2e / kg

Please recalculate using actual materials and appropriate ICE database figures and update GHG calcs.

2/. Transformers
Are incorrectly stated as being made from electrogalvanized steel. They are most likely made from a highly specialized iron-silicon alloy **Cold-Rolled Grain-Oriented (CRGO) electrical steel**. They also use considerable quantities of copper in windings and the larger 400Kv units use a lot of cooling oil which requires servicing replacement.

Please recalculate using accurate materials and appropriate ICE database figures for the 40 year lifetime and update GHG calcs.

3/. Invertors
Please note inverters are made up of multiple materials which really need to be itemised in a BOM for proper CO2 calculation accuracy. This should be available from makers.

The applicant should be able to select a generic invertor and submit accurate CO2 calcs. Research shows **String inverters are typically 15 to 25 kg CO_2e per kW of capacity**. **Central Invertors are typically 10 to 18 kg CO_2e per kW of capacity.**

Please recalculate using actual materials and appropriate ICE database figures and update GHG calcs for the lifetime use of this equipment plus its recycling CO2 .

<u>Comments on Table 5 - Place of manufacture of equipment, source of material</u>

1/. Fencing

The applicant's assumption that fencing will be locally sourced is questionable. The **f**ence may be UK sourced, but the **Galvanised High Tensile carbon steel wire** will not be manufactured in the UK.

Please use accurate CO2 figures for source of steel wire production, probably India or China, and add transport plus UK or Europe manufacturing into fencing CO2 figures.

<u>Plant vehicles and generators</u>
<u>Table 8 – Energy usage</u>

There is no breakdown of diesel usage and how this has been calculated which means the quoted figure cannot be tested.

Please can the applicant provide a breakdown of how they arrived at 864,000 litres.

This should include lifetime activities on the scheme including cutting grass (Note: This is a 420km journey between arrays for one single 3m wide cut). Cleaning the panels will also be a very slow 420 km journey for those washing them. Over 40 years these figures add considerably to the diesel usage and CO2 footprint. They should be accurately reflected.

The CO2 figures should also include all trenching excavator fuel use, and the fuel use for transport excavators to and from the site. Over a 1000+ trenches were dug by multiple excavators during the archaeology stages of the scheme. Research shows typically a 13 -15 tonne excavator with a 2M wide smooth blade bucket will use about 7 to 10 litres of diesel per hour for such trenching work.

<u>Table 9 - Water usage</u>

The applicant claims 1.3 million litres of water per annum for use in construction, solar PV module cleaning, wheel washing etc.

I dispute this figure on the following grounds.

695,760 solar panels with dimensions of 1.303m x 2.384m (From Canadian solar panel design spec sheet given to me by EPE), = 2,161,275 or 2.16 million sq metres of solar glass to clean.

There are many methods used for cleaning solar arrays, from drones with very low water carrying capacity or using rotary brushes on long poles powered by the pressure of water from a tank(er) and pump. All use significant amounts of pressurised water.

Using a very meagre 500ml per sqM (which is probably unrealistically low) means a single wash of all panels will require 1.08 million litres. I also believe in reality, more than one clean per annum will be required to maintain panel efficiency = 2.16 million litres.

A single wash using only 500ml per panel leaves only 0.22 million litres left for all other annual usage which seems very unrealistic. The BESS water tanks for example are stated to contain 465,000 litres alone.

The applicant also specifies 500,000 litres of water per annum to maintain the 335,375* plantings specified for screening. This equates to only 1.3 litres per plant per annum. 1

> *Note : *5 plants per linear metre for hedging, (double staggered row) x 60Km of fencing/boundary = 300,000 + approx. 375 trees + approx. 35,000 plantings for stated 19 hectare of woodland = Total number of plantings = 335,375.*

Any short period of research online will identify that the panels will require regular cleaning. Particularly during harvest when the dust from Combine harvesting will cover the panels. The inspector should note that EPE originally stated the panels would not require cleaning at all and this would be done naturally by rainwater.

These water-usage figures for 40 years (plus 3 years construction, plus 2 years decommissioning phase) should be revisited by the applicant, and adjusted accordingly for CO2 calculations, and should also include water tanker transport (probably 44 tonne trucks carrying 30,000 litres max) to and from site.

<u>Table 13 – Operational workers distance travelled</u>

Whilst the 50km each way commute journey is realistic, it is highly likely that the tender for the construction of this scheme will be won by a Greek or Spanish company. If so a majority of the (max) 854 construction work force stated are likely to be from these countries (See Cleve Hill solar workforce). If so, the air travel from Spain or Greece should be included. They would clearly return home many times over the 3 year construction period, at the 20 year refit and at the 2 year decommissioning phases.

The figures should be more realistically adjusted for multiple return flights home per worker, and be included in the CO2 calcs.

<u>Decommissioning stage (2070-2072)</u>

It is noted 50% of material will be sent to landfill, and 50% recycled. There are different CO2 implications depending on the exact materials to be recycled.

If for example 90% of all panels and many other materials are to be recycled as originally stated by the applicant. This will produce different CO2 figures if only 50% are recycled as stated here. Which is it? If so this should be accurately reflected in CO2 figures including transport to a recycling point capable of handling such volumes, taking into account tens of other NSIPs scale solar projects will also be shedding millions of panels in the same time frames.

<u>Table 15 – Distance to licenced disposal / recycling centre</u>

The applicant has stated these are ‘assumptive’ figures and ‘conservative’. I would suggest ‘very, very optimistic’.

Only 100km (or 62 miles stated from site to a licenced landfill or a recycling centre seems a minimal distance and is unrealistic for the scale of the material to be processed.

I bring the inspectors attention to the fact that I don’t believe the applicant can rely on massive fictitious recycling plants which don’t exist, or huge landfill sites to accept the millions of tonnes of waste. For this exercise they should use figures based on **current available capacity** for landfill and recycling.

To explain - In this scheme the applicant states a total 50% to landfill at the 20 year refit and 50% at decommissioning, plus at least 50% of the 10% replacement panels stated for general failure and replacement. This equates to:-

347,880 + 347,880 + 34,788 = 730,548 panels to landfill, with other associated infrastructure also destined for similar replacement.

Another 730,648 panels will be sent for recycling.

If ten of the other forty or so current NSIPs solar projects in planning are built roughly at the same time and of similar size they will all be shedding panels around the same point.

Say average number of panels on a typical NSIP project is, say a conservative 3750,000

At 20 year refit and decommissioning stages there will be half of 750,000 to landfill and half to recycling.

Across 40 schemes that will be **15 Million panels for recycling**, and **15 Million panels for landfill,** not including any domestic panels or schemes under the NSIP scale.

Research shows that the largest recycling for crystalline silicon panels is in Texas and they **currently process only 100,000 tonnes per annum, approx 264,000 panels.**

The best UK and European recyclers are currently recycling only in the 10,000’s at best.

I think it is not unreasonable to ask the applicant to work with **current recycling capacity** not using future recycling plant assumptions for Carbon calcs which are stated to be within 100km in the application, unless they include CO2 for building their own recycling plant to deal with the waste they will be producing.

Please may I suggest **the inspector ask the applicant to factor in shipping 730,548 panels to the ‘Solarcycle’ Texas plant,** with the associated transport and shipping traffic movements plus uprated CO2 calculations. This is the only current plant capable of dealing with such volumes.

I am sure the applicant will think this is unreasonable but if I assumed that in say 40 years time this site would be a white elephant, the owners in administration with no ring-fenced fund to decommission it, ist would carry no weight, but neither does the ability for the applicant to landfill such huge volumes without a credible channel for recycling over 730,000 panels.