Verbal representation made by Alasdair Broadbent at Cottam Open Floor Hearing 2, 07/12/2023

For any project to be viable the benefits have to clearly outweigh the costs. To make that conclusion one must be in possession of all the key facts. But for this scheme that is very difficult because all of the benefits presented are theoretical and changeable to be decided at a later date, whereas the cost are all too real.

It's very difficult to have any faith in the developers plans when even the key benefit, the energy generation of the scheme, is a wildly inflated estimate being based on the technical capability of the panels, not their realistic expected output. That system is fine for conventional power stations that can run at their capability, but when used by solar is misleading.

According to a report from the department of Business, Energy and Industrial Strategy the load factor current being achieved by solar facilities in the UK, is only 10.2% [Department for Business, Energy and Industrial Strategy,2021]. Therefore, the actual capability of this 600MW plant is more likely to be 61MW. But this is by no means a guaranteed value as the applicant has so many caveats such as not specifying the panels type (fixed or tracking) or even the panel technology they will use.

To make matters worse that generation is an average with the load factor being heavily weighted to summer months where it gets up to 15%, this reduces to less than 6% in winter months when the capacity is actually needed.

Compounding things even further is the fact that the power generated is all during the day when demand is low; and there is no energy produced when it is actually needed. This is a limitation understood by the developer. With battery storage of unspecified capacities being hailed as a solution to bridge the gap. Unfortunately, storing meaningful capacity in batteries isn't really feasible and certainly not achievable on a national scale. The way other stations improve this issue it to have pumped hydroelectric energy storage, which would be better idea than batteries other than that it would require hilly land something Lincolnshire isn't known for so potentially there are better locations for this sort of facility.

Without the developer being able to guarantee a minimum generation, I don't see how a fair decision can be made on this application.

Another area I would like to highlight is there is much conflicting information provided to the public and there are several schemes in this areas, making understanding and keeping track of them though the application process impossible for most people. A sceptical person would wonder if that was an intentional ploy. This issue is highlighted by the difference in generation figures given by what should be very similar projects.

Based on information given to me by Tillbridge (see attached email), they would put solar panels on 900 hectors and produce 122MW/hr (12.4MW/hr using a utilisation factor of 10.2%), but Cottam using 1150 hectors will get 600MW (61MW). So supposably, Cottam will be achieving nearly four times the amount per hector than Tillbridge predict.

So, either Cottam have a must better solution, which they should be sharing with Tillbridge, or Cottom is extremely optimistic. And it would be awful if this application was approved based on a belief it could generate a lot more than it will in reality.

Using Tillbridge's numbers: Cottam would only produce 16MW, which is less than an energy from waste plant which would require 10 hectors of land.

One of the main arguments for this and similar projects is, grid security. Which considering the likely generation, it won't have any significant effect on. But it most definitely will be at the expense of food security. In 2020, the UK imported 46% of the food it consumed [Department for Environment Food & Rural Affairs, 2021], so removing farmland from production will mean we are more dependent on imports. In a situation a where international relations deteriorate or there are shortages, I know I would much rather have to limit my energy usage than ration food.

The food that would have been grown on the land will still be required, which would need importing. Assuming wheat was grown on the same amount of land and using 8t/ha as the average wheat yield [Lincolnshire Pride, 2023], importing that wheat would produce carbon release from the burning of fossil fuels, assuming it was imported from Cannada and transported by a bulk carrier emitted 3.54 grams of CO_2e per metric ton of goods shipped per kilometre [Tiseo, 2023]. The distance between United Kingdom and Canada by cargo ship is 2,502 Nautical Miles (4,634 Kilometres / 2,880 Miles). This distance is measured by sea between Liverpool and Halifax. [Fluent Cargo, 2023]

Therefore, the carbon impact would be:

=8 x1400=112,000t x 3.4x 4634=1,764,627g/ 1,765 t of carbon per year.

There are many other less easily measured consequences. For example, a secondary product from grain production is straw, which has many uses such as bedding for livestock. So, with the tens of thousands of acres planned for solar, it could result in shortages or additional imports.

Conclusion

Solar panels are a good technology when installed in the right circumstances. In the USA there are areas that achieve a load factor of 29% [U.S. Energy Information Administration. (2019)] on land akin to desert which maybe a fair exchange. But unlike that situation we are talking about using valuable farmland to get a third of the benefit which I think is ludicrous.

We should only be considering technologies that that the minimum possible impact and that work alongside our way of life. An example of this is wind turbines which although divisive, they take a fraction of the footprint of solar and allow the land round them to still be farmed.

Humans have been damaging our planet for centuries a fact we are now aware of, therefore it is our duty make sure we don't inadvertently cause more damage while trying to reduce our impact. The wrong action is worse than doing nothing. Which is that I believe this is… the wrong action.

Comments on statements made by Mr. Phillips on behalf of the applicant at the open hearing 2, 07/12/2023

Claim: There is no food security issue.

This is the same as saying there is no energy security issue. It is true that we have been able meet our demands for both by supplementing what was produced in the UK with imports. But being fully self sufficient is the only way to have complete security. In 2020, the UK imported 46% of the food it consumed [Department for Environment Food & Rural Affairs, 2021] and 28% of its energy requirements. Both of these areas of security are important, and one shouldn't be sacrificed at the expense of the other.

This claim is also not an opinion shared by The UK Food Security Report (UKFSR) who have highlighted the issues and report that we have faced shortages as recently as 2020 during the first wave of the covid 19 pandemic [Dimbleby 2021].

Claim: The plant will produce 500MW (the inspectorate highlighted that the connection was 600MW).

Paragraph 7.8.62 in Chapter 7 (Climate Change) of the Environmental Statement (linked here) details that the Scheme has an estimated total energy generation figure of around 35,590,658 MWh over the estimated 40-year assessed lifetime.

This is an average of 101.6MW/hr when adjusted for a load factor of 10.2% reduces to 10.4MW.

This is also in conflict with the developers claim that high density solar produces 1205 GWh/Yr/Ha,

35,590,658 MWh divided by 40= 890 GWh/Yr/Ha.

Table 7.1: Annual electricity generation per hectare for different generation technologies

Technology	MW	Ha	Assumed Load Factor	Annual Output GWh/Yr/Ha
Onshore Wind - High	6	10.0	30%	1577
Solar - High	1	0.8	11%	1205
Onshore Actual - Low	6	16.0	30%	986
Solar - Low	1	1.6	11%	602
Biogas	1	450.0	100%	19

I requested a breakdown of the expected generation and the assumptions behind the calculations but have only been given the same as the above which doesn't state how they have calculated their estimated generation figure.

The figures given by the applicant have numerous conflicts and exaggeration that don't stand up to scrutiny.

I hope that the examination authority has technical engineering support that are able to fact check the applicants claims and have information beyond just the figures presented.

Claim: This Scheme will hive carbon zero.

All over the information the term capacity is used, "*The Scheme will provide a significant capacity of low-carbon generation to national system adequacy targets*;" the capacity is significant, but the

actual production will be 10.2% of that. Comparing the carbon release per MW capacity looks good but if you compare it to carbon release per MW expected the situation become much worse.

"7.8.63 Based on the total energy generation of the Scheme and the worst-case assumption for total lifespan project GHG emissions of 754,545tCO2e, in Option B, the intensity of the Scheme is estimated to be 21.2gCO2e/kWh."

Is this based on capacity as it needs to be adjusted to account for the load factor? That would affect the potential benefit 10 fold.

References:

Department for Environment Food & Rural Affairs. (2023). United Kingdom Food Security Report 2021: Theme 2: UK Food Supply Sources. [Online]. GOV.com. Last Updated: 5 October 2023. Available at: https://www.gov.uk/government/statistics/united-kingdom-food-security-report-2021/united-kingdom-foo [Accessed 01 December 2023].

Department for Business, Energy & Industrial Strategy. (2022). UK ENERGY IN BRIEF 2022. [Online]. . Last Updated: 2022. Available at: https://www.gov.uk/government/statistics/uk-energy-in-brief-2022 [Accessed 19 December 2023].

Fluent Cargo. (2023). United Kingdom to Canada By Air freight, Cargo ship or Road. [Online]. fluentcargo. Available at: https://www.fluentcargo.com/routes/united-kingdom/canada [Accessed 01 December 2023].

Lincolnshire Pride. (2023). Farming in Lincolnshire. [Online]. Lincolnshire Pride. Last Updated: 15 August 2023. Available at: https://www.pridemagazines.co.uk/lincolnshire/food-and-drink/farming-in-lincolnshire/08-2023 [Accessed 01 December 2023].

Ian Tiseo. (2023). Average carbon footprint of cargo ships in the United Kingdom (UK) in 2023, by type. [Online]. Statista. Last Updated: 11th October 2023. Available at: https://www.statista.com/statistics/1233482/carbon-footprint-of-cargo-ships-by-type-uk/#:~:text=In%2 [Accessed 01 December 2023].

U.S. Energy Information Administration. (2019). Southwestern states have better solar resources and higher solar PV capacity factors. [Online]. TODAY IN ENERGY. Last Updated: 12th JUNE 2019. Available at: https://www.eia.gov/todayinenergy/detail.php?id=39832 [Accessed 01 December 2023].

Henry Dimbleby. (2021). The National Food Strategy: The Plan. UK Food Strategy Review. [Online]. 01 July 2021. Available at https://www.nationalfoodstrategy.org/the-report/ [Accessed 19 December 2023].

Chart 2: Quarterly Solar PV load factors by FIT year