P-06-1344 Moderate quality agricultural land (grade 3b) should be used for food security not solar farms - Petitioner to Committee, 26 April, 2024

CAEVOD's response to Welsh Government report: The impact of solar photovoltaic sites on agricultural soils and land quality: review of impacts.

Thank you for the opportunity to comment on this report.

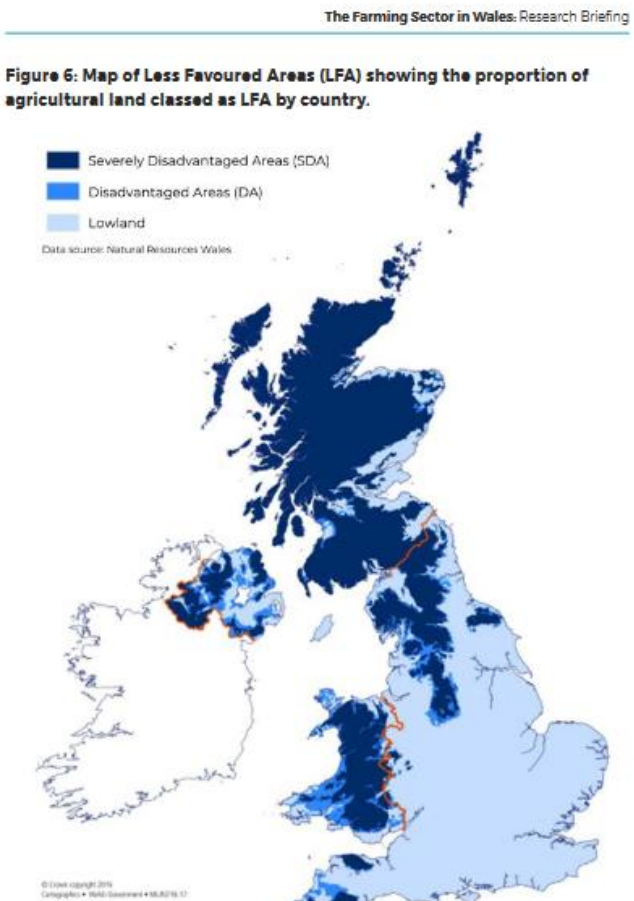
1. It is good to see the clear linking of construction/decommission activities to soil compaction and the consequential reduction in agricultural land grade regardless of the initial wetness class of the soil. Unfortunately, this report concentrates on BMV land and gives little evidential consideration of grade 3b agricultural land, which is the subject of our petition. We have previously highlighted how important 3b land is given the small amount of BMV land in Wales. The report reminds us that grade 3b is perfectly capable of contributing to our food security, producing moderate yields of a narrow range of crops, principally cereals and grass or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year. The Welsh Government's Soil Policy and Agricultural Land Use Planning Unit state that there is often only a very fine line between grades 3a & 3b, which suggests that a similar link between construction/decommission activities and reduction in land grade would be expected. This finding supports our argument that if 3b land is used for solar farms then it will not be possible to return it to its previous use to grow commercially viable crops after decommissioning, leading to a reduction in Wales' food security. It is good to see that some compaction effects can be reduced for example by the use of tracked vehicles but 3b land is already limited in its ability to produce commercially viable crops. It seems likely that any construction compaction would have permanent consequences.
   We welcome the inclusion of 8.3 BMV v non-BMV agricultural land in the report but suggest that its position at the end may result in the report's most relevant key findings for Wales and the importance that needs to be attached to the protection of 3b land may be overlooked so they are stated below:
   - ' in many instances the soils on BMV agricultural land may potentially be easier to restore after decommissioning than non-BMV.'
   - 'On any land with heavier soil types in wetter, cooler climates the soil is likely to be more susceptible to damage during the construction, operation and decommissioning phases.'
   - 'There will be a shorter safe window for construction, decommissioning, aftercare and even sheep grazing through the operational phase.'
   - ' Where droughtiness is the main limitation the characteristics of a sandy soil profile with a moderately stony subsoil may be altered during soil handling and affect the water holding capacity of the soil profile at decommissioning, leading to a change in the ALC grade.'
   - 'The management history of non-BMV agricultural land will influence the baseline soil reference values and the potential carbon capture benefit of solar PV sites.'
   - 'There may also be greater environmental risks during construction, operation and decommissioning on non-BMV agricultural land. Soils may be at field capacity or

have a clayey or silty soil texture with a landform resulting in surface water runoff. In such instances there may be a greater risk of soil erosion and pollution of water courses.'

2. The report clearly describes the large amount of soil disturbance that happens during the construction of a solar farm. In addition, our own research similarly found that runoff from solar panels can result in rivulets. Both scenarios can lead to soil loss by erosion. As described in the 4.4 The Influence of Solar Developments on Soil Loss and Erosion 'However, the steepness of the slope would be an even stronger influence.' highlighting the importance of ensuring that solar farms avoid sloping land.

3. We object to the inclusion of unsubstantiated statements advocated by solar developers: 2.2 Overview of Operational Phase 'Grass on the site is often grazed by sheep, particularly in Wales.' and 2.4.4 Operational Phase 'Land between and underneath the PV panels is often grazed by sheep…' Whilst it is true that sheep farming is important in Wales, these are meaningless comments without factual evidence to support them. Our observations of solar farms both locally and further afield is that sheep rarely graze under solar panels; the vegetation is cut by machine instead.
   Most cattle and sheep farming actually happens on Less Favoured Areas of land in the UK which are not profitable for crop production. '79% of all land in Wales is classed as Less Favoured Area (LFA). This EU designation refers to areas where geographic, soil or climatic conditions constrain productivity and make farming more difficult. In Wales this reflects the mountainous terrain, steep slopes on upland farms and high rainfall.' *https://research.senedd.wales/media/iuch3jz1/22-47-farming-sector-in-wales.pdf*

   The following map illustrates where these areas are in comparison to the more favoured lowland areas which are most commonly used for commercially viable crop production.



It is clear that the very areas that are most suitable for crop production are being sought after by solar developers due to their flatter land, better transport links and grid connections making construction easier. Sheep are being promoted in solar farm proposals in an attempt to offset the loss of crop producing land, not because the land is only suitable for grazing by sheep (or cattle). The report highlights in 2.4.4. Defra's blog (2021) https://defrafarming.blog.gov.uk/sustainable-farming-incentive-pilot-guidance-remove-soil-compaction/ that sheep 'in high numbers can produce a solid compaction layer 2cm to 6cm deep over a wide area' suggesting their introduction to a solar farm would compound soil compaction and degrade land quality further, not enhance it. 4.1 Potential Impacts on Soils during Operational Stage 'Grazing of grassland by sheep required careful management. Excessive stocking rates and/or grazing on soils susceptible to damage during wet weather, may negatively impact the soil during the operation phase and may pose environmental issues such as increased surface water runoff.' Unfortunately, this report has not had the remit to explore how often the vegetation under solar farms is actually grazed by sheep, what stocking rate would avoid compaction issues and whether sheep grazing would continue to be viable over the lifetime of a solar farm as the nutritional quality of the grass becomes depleted over time (the stated intention of solar proposals is not to use fertilisers to maintain it). Given that Wales is trying to reduce its carbon emissions, is introducing sheep grazing at all onto agricultural land that can be used to grow crops really going in the right direction?

4. It is of concern that in 2.4.5 Decommissioning 'the impact of pile pull-out on agricultural land and soil is a 'grey' area with few conclusions having been drawn to date.' Huge numbers of piles would need to be removed at this stage – surely the impact of this should be determined before they are put in in the first place?

5. The report only explores the impact of solar voltaic panels on the BMV agricultural soils and land quality. Consideration of their effect on agricultural productivity is only given a cursory reference, 'The impact of soil compaction is well documented (Batey, 2009) and crop growth, yield and quality may be adversely affected.' 3.3 Soil Compaction and Droughtiness 'On solar PV sites both disturbed and undisturbed land at decommissioning may be affected by the introduction of unremediated soil compaction. This could reduce the crop available water of the soil profile, changing the ALC grade in the soil droughtiness assessment and may result in downgrading and /or loss of BMV'. 5.2 Evidence Base 'At the point of decommissioning there is likely to be a residual impact of soil compaction across solar PV sites. The impact may affect the agricultural use of the land and decisions about cropping and yields.' Figure 6 in the report clearly shows the discrepancy between vegetation growth under solar panels compared to between rows of solar panels. 4.3 The Influence of Shading and Microclimates beneath panels on soil microbial activity 'The above ground plant biomass was four times higher in the gap between arrays and the control areas compared to the biomass under the PV arrays.' 5.3 The Main Issues affecting Reversion to Agriculture 'Most standard steel products corrode, particularly in the upper part of the pile and this may adversely affect the ability to extract the piles after

40 years.' These piles will either be left in the ground or dug out, both solutions will further damage the soil and the former is likely to result in a downgrade of even BMV land to grade 4 or 5.
It is clear from the above points that the effect of solar farms on short- and long-term agricultural productivity must be investigated further as a matter of urgency to protect our food security. The Institute of Biological, Environmental and Rural Sciences (IBERS) at the University of Aberystwyth has a long history of crop research and perhaps would be well placed to explore the effect of solar voltaic cells on agricultural productivity on all agricultural land grades and so provide guidance on the best agricultural use of land beneath solar panels.

6. Whilst it is welcomed that the report comments on the unknown effects of contamination of the soil by the zinc coating on the galvanished metal posts, it is disappointing that there is no reference to the unknown effects of contamination of the soil by the coating applied to solar panels or the chemicals used to clean them. Once in the soil, how will these be removed so that the food produced from the site either during operation or after decommissioning is safe to eat?

7. It is concerning that without remediation the report finds that there is the introduction/ reduction in the depth of a slowly permeable layer after compaction which 'prevents the downwards movement of water in the soil profile and can lead to surface water perched at shallow depth for periods of the year, particularly autumn through to spring, and particularly problematic in wetter soil types or wetter areas. This can negatively impact the flexibility of agricultural land, potentially lowering quality and ALC grade.' What has been left out here is the potential increase in flood risk to the surrounding area if the water that previously descended further into the soil profile can't do so.

8. The report states that 'further evidence is required to substantiate the benefits of SOM at solar PV sites and the claims cited by developers in planning applications.' We would add that this needs to be done now and before further agricultural land in Wales is approved for solar farm use. 4.5 A Summary of Claimed Benefits to Soil from previous cases 'The case studies do not give any site-specific detail on benefits to soil in the supporting documents for the planning application.' This is alarming given that benefits to the soil are often cited in by developers yet this suggests at planning approval level no real consideration is given to whether such benefits are attainable in reality.

9. 5.3 The Main Issues influencing Reversion to Agriculture raises some concerning points:

    - 'A soil in West Wales with a medium clay loam texture and clay content of 24% will have a shorter window for soil handling and trafficking than the same soil in East Anglia. The impact of climate and climatic zones should be built into the design statement at the pre-planning stage of a site.' Is this really being considered when assessing suitable site selection in the DNS process?

- The report highlights the lack of real planning for the decommissioning of a solar farm at the planning approval stage. Our observations of local planning applications for

  solar farms are similar; because 40 years is a long way off detailed planning is kicked into the long grass. 5.4 Summary ‘The finance available for the required decommissioning and the timings of these operations may be an influencing factor on the reversion to agriculture. There may be financial constraints, time penalties and contractual performance issues that affect the decommissioning programme and the quality of remediation works.’ This illustrates that there are no guarantees that it will be financially possible to redress the damage to soil structure and agricultural productivity.
- The report highlights in several places that conditions for soil handling (such as those used in construction/decommission activities) are not suitable during the winter months. 8.2 Restoration of Agricultural Land ‘Commercial pressures can influence a restoration programme, resulting in work taking place in unsuitable conditions, resulting in damage to the soil and potentially loss of BMV.’ Are non-soil handling periods included in the timescales cited by solar developers or included in planning conditions attached to planning approvals?

Although the UK government has so far been unwilling to protect 3b land, we understand from our local MP Alun Cairns that there is increasing concern about the long-term effects of solar farms on all grades of agricultural land. We hope that the petitions committee will consult with the new Welsh Minister for Climate Change and Rural Affairs and express our continued concerns that the use of 3b land for solar farms is threatening our future food security because the amount of BMV land in Wales is so limited.