Briefing

# Why new solar farms boost UK food security

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green alliance...

## Background

The UK government has a target to generate 70GW of electricity from solar by 2035. Meeting this ambition quickly will be an essential part of delivering the government's mission to achieve clean power by 2030. It will also reduce the major threats posed to food production by climate change and nature decline.

The energy secretary Ed Miliband approved three solar farms in July 2024 – Sunnica, Gate Burton and Mallard Pass – which will add a combined 1.4GW to the existing 15.5GW of solar power generated across the UK. These three farms will deliver two per cent of the 2035 target.

It is often claimed that large scale solar farms are a threat to domestic food production, as they are sited on farmland. But this is inaccurate as solar farms are generally built on land which does not produce a significant amount of food and the amount of solar needed to meet government targets will use roughly half the area currently taken up by golf courses.

Our analysis shows that climate change's impact on reducing food production is already greater than the reduction that would be caused by using low grade farmland for solar farms.

Climate change and biodiversity loss are identified as the greatest threats to domestic food security by the government's 2021 UK Food Security Report. Climate change can be mitigated by investing in clean energy, like solar.

## Is there public support for solar energy?

Solar is consistently the most popular form of renewable energy. The government's Public Attitudes Tracker in spring 2024 found 88 per cent of people supported solar, making it the most popular form of renewable energy. Eighty three per cent of people would be 'happy' or 'very happy' to have a solar farm in their local area.

Solar farms are also popular with farmers. Many find that leasing some of their less productive land to a solar energy company provides them with

reliable income, complementing their existing activities and ensuring their farms can remain profitable.

## What impact is climate change having on food production?

Climate change is already having a huge impact on food production, both in the UK and overseas. Shortages on supermarket shelves in recent years have been caused by wet weather, heatwaves, and increased pests and diseases in the UK, as well as the impact of extreme weather overseas reducing imports. It is clear that climate change is disrupting food production here and now.

Food production in the UK is expected to be significantly reduced in 2024, following the wettest 18 months since records began in 1836. This year, England will produce 26 per cent less wheat than in 2023. This lost production could have fed 18 million people.

Our analysis shows the loss of wheat in 2024 alone is 5,761 times greater than the amount of food production that would be lost to the three new solar farms approved in July.[1]

Research from the Energy and Climate Intelligence Unit (ECIU) suggests the wet winter of 2023-24 has reduced the UK's ability to feed itself by nearly a tenth.

## How do solar farms boost food production?

Solar is a major source of clean energy. Decarbonising the energy system is a central part of reducing carbon emissions, thereby protecting against the threat of increasingly volatile weather.

The Met Office and World Food Programme have demonstrated that a rapid and sustained reduction in carbon emissions, along with adaptation efforts, would help to avoid increasing food insecurity driven by climate change.

Solar farms are generally installed on low quality farmland, less well suited to growing food, meaning they have very limited impact on the amount of food produced but offer an important income stream for farms that does not vary with the weather. In 2023, renewable energy production added on average £5,900 to the average lowland grazing farm's income of £23,000.[2]

Indeed, food production can often continue alongside solar panels in many cases. Under agrivoltaics – essentially solar panels on stilts, where crops are grown below the panels – crop yields fall on average around eight per cent, compared to conventional cultivation, but in drier years yields can actually rise. Many solar farms are home to grazing animals, like sheep, which can be kept side by side with standard panels.

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## Endnotes

[1] We assumed the three solar farms would take 35 hectares of grade 2 agricultural land, 292 hectares of grade 3a land, 1,339 hectares of grade 3b land and 411 hectares of grade 4 land, according to their plans (see: Gate Burton, Mallard Pass and Sunnica). The plans show that no grade 1 land, which is the most productive for agriculture, is affected. We assumed that grade 2 and grade 3a land is arable (and that the area of arable land in England is approximately equal to the area of grade 1, 2 and 3a land in England) and that animals graze grade 3b and 4 land. Therefore, we estimated the percent of production lost from these areas, given the National Food Strategy's analysis that 84 per cent of the calories produced in the UK come from the 37 per cent of farmland that is arable, and 16 per cent of calories are produced on the 63 per cent of farmland that is grazed. Given estimates of calorie availability in the UK of 3.344 kcal per person per day, with 49 per cent of calories produced domestically, we calculated the calories that would be lost to the three solar farms. In contrast, the 27 per cent reduction in wheat production in 2024 compared to 2023, using standard estimates of energy density, is 5,761 times more food lost than that lost due to the three solar farms.

[2] 2023 farm income taken from the Department for Environment, Food and Rural Affairs' (Defra's) estimates. Income from renewable energy was estimated as the five year average from 2018 to 2022, since the most recent year was not available.