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# As profits dry up, farmers are pivoting from seeds to solar

Solar panels can provide a consistent flow of money and security

By **SOPHIA EPSTEIN**  
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Credit **Getty Images / NurPhoto / Contributor**

husband died. “I had to hire contractors and it just wasn’t paying,” she says, “so I was going to sell up.”

Instead, she covered 30 acres of her land in solar panels. “It’s a lifesaver,” says Wilson, who doesn’t run the solar farm herself. She rents the land to an energy company, which turns out to be a much more reliable business venture than growing grain. “Farming has gone ludicrous,” she says. “It’s actually beyond a joke. It’s got to the point now where growing wheat and barley isn’t profitable.” That’s why she, and many farmers, are farming solar energy too.

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“It offers secure income for farmers and landowners, which is scarcer than hen’s teeth at the moment,” says Chris Thyer, rural associate director at GSC Grays

unpredictable weather and for those in the city, the loss of EU support payments post Brexit. “Everyone is worried about what’s going to happen this year.”

Renting out fields is the go-to option. “From the farmer’s perspective, their core business is still going to be farming,” Thyer says. “All of this is someone else’s project that’s happening on their land.” The farmers can focus their energy on tending to their other fields of sheep and vegetables, while the solar panels provide a consistent flow of money and security.

When Wilson got into solar, government subsidies were still in place, so small 30-acre plots were still a worthwhile investment. Now, the subsidies are gone, so the projects need to be bigger to make real money, because installing the panels costs a massive amount. Thyer secured planning permission for a 200-acre solar project in Yorkshire late last year, for example, which will power 15,000 homes. A project of that scale “could cost tens of millions to build,” he says.

This need for massive acreage makes farming land even more desirable, because it’s hard to find the space elsewhere. In cities, you’d be lucky to get a couple of rooftops. And on the outskirts of urban areas, you’d be competing with housing developments. “So it only really works in more remote locations,” says Thyer.

There are rules though. You can’t cover up the most fertile land. Planning permission will only be granted to lower-yield fields or grass used for grazing. When the solar panels are installed, the fields can still be used, either by filling them with bumblebee-friendly flowers or using them to graze small animals like sheep or goats. So, Thyer says, “any loss to food production would be minimal.”

It isn’t just happening in the UK. Research has found that farmland is likely to be one of the best places for solar farms to be created. If less than one per cent of the world’s agricultural land was converted to solar panels, it would be able to produce enough electricity for the entire world’s demand, academics at Oregon State University [have found](#).

Converting farmland to solar doesn’t mean that the land can’t be used for agriculture. In Europe, they’re testing a hybrid system that puts solar panels and full-force vegetable farming in the same fields. Fraunhofer, a German research organisation, has been working with a farm near Konstanz in South Germany for more than three years on a project that uses the same familiar solar panels, just propped 12 metres in the air. The setup is high enough that tractors and harvesters can still work below it, so crops can be grown underneath. They’ve given it the catchy name: agrophotovoltaics (APV).

“It doesn’t completely cover the canopy, so there is still some light coming through,” says Iris Lewandowski, chief bioeconomy officer at the University of Hohenheim, who works on the project. “The only difference for the farmers is that they have to make sure they don’t drive into the pillars.”

else, not matter how infertile – so this is a way to get solar panels onto farmland without repurposing it entirely. There are also other options available: in the Netherlands work is underway on creating [Europes largest](#) floating solar farm. As available land in the country is sparse the solar farm is being built on a sandpit lake. The technology could make previously unusable spaces a boom for solar farms.

But the dual-harvest system also seems to work. The team at Fraunhofer have been monitoring the crop yields from below the APV system for several years. Most years, production levels dropped about ten per cent because of the shade, but in hotter years, such as 2018, some of the crops actually benefitted from being blocked from the sun. Potatoes and wheat both saw a three per cent increase, but the biggest winner was the celery plants, which saw a 12 per cent gain.

“The yield wasn’t effected,” says Lewandowski, meaning there were the same number of plants as expected, “but it grew more leaves.” While the number of celeriac (celery root) produced was about the same as usual, the protection from the solar panels boosted the amount of celery (celery leaves) harvested. “The microclimate underneath the solar panels changed and that impacted the development,” she says. That’s good news, especially for arid regions.

Fraunhofer did a pilot project on a farm in Maharashtra, India, where they were growing cotton and tomatoes. The shade from the panels not only protected the tomatoes and cotton from the heat, it also prevented water from evaporating, and led to a 40 per cent higher yield of both crops. The Oregon State University academics have also looked at the viability of using solar panels as part of a dual-harvest and have also observed success. “Researchers have successfully grown aloe vera, tomatoes, biogas maize, pasture grass, and lettuce in agrivoltaic experiments,” they [write](#).

“In Europe, regions that would really benefit would be in the south, like Spain,” says Lewandowski, or any other arid location. More temperate regions are more likely to see crop yield losses of about ten per cent. That’s not the end of the world, as the power generated by the panels would be enough to counteract the loss economically. But the initial investment in the giant 12-metre-high steel structure is massive, so that may put investors off. “I don’t know the break even point,” says Lewandowski, “but if I was to advise someone to go for it, it would be in an arid region.”

Thyer agrees. “The UK isn’t the sunniest place in the world, so it’s never going to be as efficient as somewhere closer to the equator,” he says. “So the cost of having to put the panels on such tall pillars suddenly gets prohibitively expensive. We’re doing the best we can out of the situation we’ve got.”

Converting the not-quite-fertile fields into solar farms seems to be a profitable enough endeavour. Wilson makes £30,000 per year alone on rent from her solar

...any more, says Wilson. "I don't think it's fair that I should have to subsidise my industry like this."

While there's an argument to be made that the solar panels are only temporary and the ground below could benefit from having 40 years of rest, it doesn't feel like anyone will be rushing back. Wilson is planning the exact opposite. "We've just secured grid connection for another 100 acres for 2024," she says. "If I could have every single acre be solar, I would."

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