Business Update – Solar Panels

Information correct as at 09:00am on 07.10.2022

The return on investment has improved on solar panels
Now economic to install on most dairy farms
Limited in size by the National Grid capacity for many farms
Producing excess for the grid does not pay as well, so aim to use as much on farm as possible

While the government has announced a reduction in energy bills for businesses, this is only guaranteed until March 2023. Producing more energy on farm could save money from next summer and will lower carbon footprint scores, as well as making farms more sustainable in the long term.

Solar PV panels on existing buildings are one of the easiest ways to do this. This note runs through an example of the possible economic gain and the step-by-step process of installing them.

Economics and Return on Investment

The efficiency of production from panels will vary on location, the direction they face and weather, for this example we have used 82%, on a 50KW installation.

The benefit to the farm will depend on the amount that can be used "in house", with excess sold to the National Grid. Despite some supplier projections, using it all every day is unlikely because it is not produced or used evenly, so we base use at 80% with 20% sold to the grid and 90% used with 10% sold in the table below, with surplus sold at 12p/KW. Prices can vary with a likely range from 6p to 18p/KW.

This example is based on a £60,000 installation cost on a 10-year loan, at interest at 5%.

Electricity price p/KW	Estimate of KW produced	Payback (years) when 80% used on farm	Payback (years) when 90% used on farm
60p	41,000	3.2 years	2.9 years
48p	41,000	4 years	3.7 years
38p	41,000	5.2 years	4.7 years

Step by Step Tips

Solar panels must be connected to the National Grid, this requires form filling and can cause delays. This will limit the size of the installation, but the companies quoting to install panels can help with this.

Planning permission is not usually needed to mount them on existing buildings, but check with your local planning authority. Other types of installation probably do need planning permission.

The roof of the building may need strengthening, which may increase the cost. Get a quote to check if this is necessary, it may not cost as much as you fear.

If funding via a bank loan, ask about "green loans" which may have no arrangement fee. As inflation is high and costs are increasing, be wary of short-term finance leaving you short of cash. Always check the interest rate is fair and shop around.

Get quotes as soon as possible, as there is a delay in sourcing panels and a queue for installation. Typically, the cost will be about £1,000 per KW, be wary of cheaper quotes and always try to find someone to vouch for potential suppliers. On top of this there will be an electrician's bill and fee for connection to the grid, this can vary but we usually start with a budget of £10,000 per installation.

Ask the companies quoting for the calculations on energy production, which will depend on the way they face and your geographic location. South is ideal, but south-east or south-west do not reduce the electricity produced by as much as you might expect. Be aware this is not guaranteed production, so you may wish to do your own calculations on 10 or 20% less to be sure the return is viable.

How much should you put up?

The National Grid connection is likely to be the limiting factor, otherwise it is reasonable to install as much as you can afford to fund and/or use on the farm. For a 200-cow dairy farm 40-50KW is a good start point if you want to start getting quotes. The return on investment is relatively short compared with the lifespan of panels, with many on farm for 10 plus years now without any issues.

Maintenance: Typically, you just need to get them cleaned once or twice a year, as they do get dusty. We recommend using a cleaning contractor, who has the right equipment to do this safely.

Maximising the benefit

To get the most out of the installation means using electricity when it is being produced and evening out the use, so for example the main ice building takes place before afternoon milking. Slurry separators and or water heaters may be better timed to come on after morning milking. Water heaters may benefit from extra insulation to keep the water warm.

Alternatives

If solar panels are not possible to install on your farm you could consider:

- Thermal solar panels which preheat water for washing, etc, and do not need a grid connection
- Wind turbines – those of a decent scale require a large capital outlay, usually do require planning permission and will need a connection to the National Grid
- Ground source heat pump installations to preheat water and houses
- Ways to reduce energy use on your farm e.g. bigger plate coolers, heat recovery systems, variable speed vacuum pumps, LED lights.