

Friends at Broadmayne School (FABS) – Solar PV

Project cost

£4,750

Estimated Savings

£400 / 2 tonnes of CO₂e per year

Equipment / Installer

3.72 kW solar PV rooftop array (12 panels) - Tincleton Solar Systems

Grant
awarded:
£1,900

Estimated
Annual
Savings: **£400 /
2 tonnes
of CO₂e***

The Project

FABS (Friends at Broadmayne School) is the Parent Teacher and Friends Association of Broadmayne First School. As a registered charity, they bring together parents, teachers and the wider community to help raise funds and provide support for the school. They are also responsible for the day-to-day running of the school's open-air swimming pool.

In a bid to reduce the associated emissions and running costs of the swimming pool, FABS secured funding from Low Carbon Dorset to install solar PV panels on the school roof. These panels are expected to generate just over 3,000 kWh of electricity each year, which will help reduce running costs and cut the pool's carbon footprint by over 20%.

Getting started

The heating and running of swimming pools is often very costly and energy intensive. In 2018, when Broadmayne First School began making plans to improve their pool's plant room and storage building, they decided to also investigate ways they could tackle these high costs and emissions.

The Broadmayne pool is 12m by 7m with an average depth of around 1m. And is available for use by the school in term time and the wider public in the summer



*CO₂e, or carbon dioxide equivalent, is a term used to describe different greenhouse gases in a common unit. For any quantity and type of greenhouse gas, CO₂e signifies the amount of CO₂ which would have the equivalent global warming impact. And allows us to express a carbon footprint consisting of lots of different greenhouse gases as a single number.

holidays. As a result, it is heated from June until mid-September by a gas boiler, and from May to September they use a 750-W electric pump to circulate the water.

The school's increased need for energy in the summer to run the pump makes an obvious case for installing solar panels – with solar PV generating the most energy when the pool's demand is at its peak.

Solar PV

Prior to contacting Low Carbon Dorset for support, the school had planned to install solar panels on their new poolside building. However, a site visit from Low Carbon Dorset immediately flagged that shading from near-by trees would heavily impact on the amount of energy that could be generated from these panels. With the help of the Low Carbon Dorset technical officer, a more suitable location was identified (on the neighbouring school building), and a grant was awarded to help cover 40% of the costs of the installation and commissioning of the panels.

After structural strengthening work was conducted, a 3.72kWp solar PV array was installed on the roof of Broadmayne First School. It is anticipated that this array will generate 3,035 kWh a year, **this electricity will power the pool's pump through the summer months, and when the pump is not in use will provide power to the school.** It is estimated that the pool and school will use around 90% of the power it generates, saving them on average just under £400 a year. This means that, with the help of the grant, the panels will pay for themselves in 7 years - this is 5 years quicker than without the grant!

By generating their own power renewably, it is estimated that the school will save around 2 tonnes of CO₂e a year, reducing the carbon footprint of the pool by 21%. And the reduction in their energy bills as a result helps secure the future of this highly valued community asset.

The installation of the panels has also provided an excellent opportunity for pupils to learn about renewable energy and fits in well with the school's wider work around sustainability.



Other recommended measures:

As the heating of the pool is a major contributor of the school's greenhouse gas emissions during summer, it was recommended that pool-related efficiency measures should be the first thing to consider when looking at reducing emissions. Recommended efficiency measures included **turning the temperature of the pool down**. This is by far and away the largest, and simplest, potential efficiency saving available. Even a small reduction in temperature can lead to large savings.

Another recommended measure was **the use of a pool cover**. This would conserve energy in two ways, firstly it stops heat leaving the surface of the water, and secondly it reduces evaporation from the surface which is a large cause of heat loss. The pool cover should be kept on whenever there isn't direct sunlight on

at least half of the pool, when it is windy, or when the air is especially dry.

It was also recommended that they explore **swapping the pool's heating system from mains gas to an air-source-heat pump (ASHP)**. ASHPs use electricity to move heat, rather than to generate it, and therefore can use electricity far more efficiently than traditional electric heating. A benefit of an electric heating source is that it will mean nearly all the electricity generated by the school's solar panels will be used, ensuring the largest possible financial savings. A rough cost to install an 18kW ASHP (the size needed for Broadmayne school's pool) is £4.5K, and annual savings to the school are likely to be around £250 a year. The swap to a heat pump would also result in large emissions savings, and would nearly halve the pool's carbon footprint, saving over 3 tonnes of CO₂e a year.



'It has been a wonderful opportunity for the school PTA to significantly reduce CO₂ emissions and costs over time, whilst continuing to provide an important facility for the school and local community.'

Friends at Broadmayne School