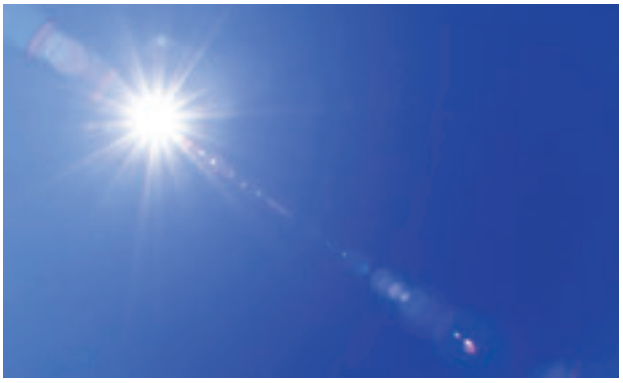
Forestry Commission



Solar energy at Forest Research

Forest Research, an agency of the Forestry Commission, is one of the world's leading centres of research into trees, woods and forests. The research station at Alice Holt in Surrey is situated within the South Downs National Park. The original Alice Holt Lodge dates back to the early 1800s and is one of a number of buildings in a complex of offices and laboratories. The Forestry Commission has occupied the Lodge since 1946, when the Research Station was first established. The laboratory and office extensions were built in 1959, with more laboratories added in the late 1970s. The Forestry Commission's South East Regional office, Seed Trading Branch and Biomass Energy Centre are also based at the site. Total electricity consumption is 677,000 kilowatt hours per annum. As part of a programme to improve energy efficiency and meet government targets on carbon reduction, Forest Research have launched a project to improve their buildings' performance. Initiatives include building renovations, installing thermostatic values to the heating system, increased levels of insulation, and the future installation of double-glazed windows. The Forestry Commission was awarded a £1.5 million grant by the Department for Energy and Climate Change (DECC) in 2009, as part of their Low Carbon Technology Programme, for the installation of renewable technologies. This funding enabled Forest Research to install a solar photovoltaic system to meet some of the research station's energy needs.



Solar Power at Alice Holt research station provides a renewable source of energy reducing reliance on power from the national grid

In January 2010 the state-of-the-art solar PV system was fitted to the laboratory roof at Alice Holt Lodge. A feasibility study was carried out prior to installation to determine whether the roof would take the weight of the new arrays. In preparation upgrades to the building included the installation of the required roofing materials, and provision of a new access route and safety rail. The £130,000 system comprises 185 mono-crystalline solar photovoltaic panels (175 watt panels with a total peak DC rating of 32.375 kilowatts).



Solar PV cells work by converting sunlight directly into electricity, and are able to generate electricity even when the sky is dull or overcast – the amount of electricity produced is directly proportional to the amount of light energy falling on the cells.

The panels cover most of the roof space and are connected to five grid-tied inverters. The PV panels produce DC electricity which is fed to the inverters and converted into 240 volts AC, which is synchronised to the grid, and supplied to the consumer unit/distribution board. Generating electricity at the point of use means there is no need to import the equivalent amount from the grid, saving 0.5 kg of CO_2 for every unit (the value attached to traditional electricity generation systems.) It is anticipated that the system will generate more than 24,000 kilowatt hours of energy a year. Should further funding become available there is space on the roof for additional PV panels and a large external area to install a field of solar panels.

An open day enabled staff to attend a presentation on how the system works and even go on the roof to view the solar arrays in operation.

The electricity system is fully integrated and metered. Electricity usage and savings are communicated to staff as part of the commitment by Forest Research to further reduce the site's carbon emissions.

Our advice

- Carry out a feasibility study to determine the most efficient, compatible and appropriate solution to installing renewable energy systems according to the building's individual needs and energy requirements.
- Use the government recommended ESPO catalogue to select appropriate renewable energy contractors and suppliers.

Achievements

- In the two months that the system has been operational a total of 5100 kilowatt hours of electricity has been generated (3154 kilowatt hours during the month of April 2010 alone).
- Anticipated reductions in carbon dioxide emissions, when compared with traditional forms of energy generation.
- The solar installation will meet approximately 6% of the research station's total electricity requirements.
- The Forest Research team and contractors worked quickly to get the system up and running in just five weeks as one of the funding conditions was that the grant had to be spent before the end of the financial year.
- The flat-roof installation is unobtrusive (it cannot be seen from the ground) and requires little maintenance.
- The system operates through a feed-in tariff scheme – a set rate is paid by the energy supplier for each unit of electricity generated.

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