

## Introduction |

This case study looks at four local authorities that have taken a lead in installing photovoltaic and solar thermal systems in very different contexts and from different starting points. It demonstrates the range of opportunities for incorporating renewables in council activities.

### The case studies are:

1. Cheshire County Council - Kingsmead Primary School
2. Daventry District Council's Solar Plan
3. Gloucestershire County Council - Wilderness Centre Eco-House
4. Powys County Council - County Hall PV Installation

## Local Authority role |

### Cheshire County Council - Kingsmead Primary School

Cheshire County Council has developed Kingsmead Primary School in Northwich, as an exemplar of sustainable construction and collaborative working. The project demonstrates how low energy, sustainable construction - design and renewable energy can be used in the development of a school.



Photo 1.

Solar PV Panels on the Roof at Kingsmead School.

### Daventry District Council's Solar Plan

In 2001, Daventry District Council received funding from the Energy Saving Trust's Carbon Reduction Pilot (now the Innovation Programme) to undertake a feasibility study looking into the possibility of supplying and installing domestic solar thermal and photovoltaic systems in Northamptonshire.

### Gloucestershire County Council - Wilderness Centre Eco-House

As a part of developing and restoring the Wilderness Centre, the county council has worked with Severn Wye Energy Agency and staff at the centre to install PV on the roof of its Eco-House. This was the Centre's first step towards becoming a low carbon exemplar through a combination of energy efficiency measures and generating renewable energy on-site.

### Powys County Council - County Hall PV Installation

In commissioning a photovoltaic installation at County Hall, Council Members realised from the outset that the installation would have a long payback time. However, their decision was based on wanting to demonstrate PV and wanting to stimulate the market for PV modules, rather than financial considerations alone.



Photo 2.

PV panels being installed at the Wilderness Centre.

## Context and funding |

### **Cheshire County Council - Kingsmead Primary School**

The school was built to minimise energy use, for example through passive solar gain and super insulation. It utilises three forms of renewable energy; photovoltaics, solar water heating and biomass.

The solar PV system cost £28,000 and is mounted on the south facing roof. It is a five kilowatt peak system and is expected to contribute 3,000 kilowatt hours per year to the school's total electricity demand of 20,000 kilowatt hours per year, saving an estimated 1.6 tonnes of carbon dioxide per year. It is hoped that any surplus electricity generated (at times of low demand) will be exported back to the grid. Partial funding for the PV system was obtained from the DTI Solar grant programme.

The solar water heating (SWH) system cost £15,500 and is mounted on an A-frame on the south facing roof. It is estimated that the SWH system will save approximately 0.4 tonnes of carbon dioxide per year. The water heated by the system will be stored in a low-pressure heat store, before further heating by the biomass system. No specific funding was obtained for the SWH system, however a grant from the Regional Development Agency was used to part subsidise the purchase, because a local company was used to install the system.

### **Daventry District Council's Solar Plan**

Daventry District Council is pro-active in the promotion of energy efficiency in its area. It has played a key role in the establishment of the Northamptonshire Home Energy Efficiency Partnership (NHEEP) and has implemented a number of successful energy efficiency schemes. Solar energy was identified as a readily applicable domestic renewable energy source. Solar is a highly visible, environmentally friendly product, and accessible to most fuel rich households. It is compatible with most forms of heating systems and in rural areas that are off the gas network, solar is an economic supplement to oil or electricity as the fuel source for homes.

The project aims to establish a mechanism for supply and installation of both solar thermal and photovoltaic systems to domestic properties in Northamptonshire at discounted prices.

#### **Key objectives of the 'Solar Plan' scheme are to:**

- **raise awareness of domestic solar systems;**
- **ensure that both solar technologies are available at accessible prices;**
- **access external grant sources available;**
- **encourage the development of a local solar industry and develop a local network of installers;**
- **encourage the incorporation of systems in new housing by housing associations and other developers;**
- **promote compatibility of solar thermal systems with combination and condensing boilers;**
- **raise awareness for council and housing association staff, and others who give advice on housing related issues;**
- **further improve cost effectiveness by targeting properties that are having major works carried out to their roof, having a boiler/heating system replaced and targeting new housing developments.**

### **Gloucestershire County Council - Wilderness Centre Eco-House**

Gloucestershire County Council runs The Wilderness Centre to provide over 50 day and residential courses per year in Environmental and Outdoor Education and Personal and Social Development. The centre serves schools and youth groups, predominantly from Gloucestershire but also further afield - catering for more than 2,000 young people each year. In addition, it runs day visits and teacher training courses and can be used by youth groups during weekends. As such it has an important function in demonstrating renewable energy. The PV system was installed on the roof of a traditional stone cottage in the grounds of the centre, which is being refurbished as an Eco-House. Visitors are able to monitor PV generation through a read-out device and then calculate carbon emissions for the duration of their course. The scheme also demonstrates the dual use of PV panelling as a weatherproof roofing material.

A particular value of the PV installation has been the employment of local contractors and young people on the Prospect Training and Young People's Learning Programme courses run at the Centre. This will result in employment opportunities for young people as on-site maintenance staff, with experience of renewable energy installation.

Another advantage of using the roof-integrated solar panels over other renewable energy installations was that the visual impact is very low as the outline of the building remains unchanged.

The system cost £19,858.30 plus VAT, including installation. There are no routine maintenance costs for the system. Funding was obtained from the DTI Major Photovoltaic Demonstration Programme. This provided 50% of the cost with the remainder of the funding coming from Gloucestershire County Council and the EDF Green Energy Fund.

### **Powys County Council - County Hall PV Installation**

Since 2001 Powys County Council has been involved in the Campaign for Take Off, an EU scheme promoting and rewarding renewable energy communities. This involved working closely with local partners (including the Welsh Development Agency, Powys Energy Agency, Dyfi Eco-Valley Partnership and Wales OPET Cymru) to submit plans and targets for renewable energy production in the county. The project covered all appropriate renewable technologies. Amongst a range of different renewable energy technologies, the Powys team set ambitious targets of:

- 5,000 sq. m of solar water collectors
- 100 kWp of PV installations

Within this context, Powys has installed the 10.08 kWp PV units at County Hall. Funding was from a combination of the DTI's PV Grant and European Objective Two funding. The Council also provided 5% of the cost from its own energy efficiency fund.

- Total installed cost of £56,965

## **Process/partners |**

### **Cheshire County Council - Kingsmead Primary School**

Several departments within the council worked together on the partnership, including education (who provided the funding and were the "client"), the county council's property management, environmental planning service. The main partner was a Project Management company along with an architectural practice, consulting structural engineers and electrical and schematic engineers.

Design was initiated in April 2003 and planning permission was obtained in summer 2003.

### **Daventry District Council's Solar Plan**

Daventry District Council is the lead organisation in the feasibility study, along with the other local authorities in Northamptonshire (South Northamptonshire and East Northamptonshire District Councils, Northampton, Corby, Kettering and Wellingborough Borough Councils) and a major power generating company. The scheme is managed on a day-to-day basis by the local authorities, with the support of a partnership consisting of the scheme suppliers and an installer-training organisation.

### **Gloucestershire County Council - Wilderness Centre**

The Wilderness Centre, Severn Wye Energy Agency (SWEA), Solar Energy Installations, Gloucestershire County Council and the Local Education Authority worked together to develop the project. SWEA, through the Community Renewables Initiative (CRI) assisted in a variety of ways, including pre feasibility study, locating funding sources and completing the funding applications.

The 2.73 kW system is arranged in a 9.8m by 2.4m array. The system generates 2,040 kWh per year, and it is anticipated that, in combination with energy efficient lighting and appliances, the PV system will make the Eco-House element of the centre self-sufficient in electricity. Any surplus electricity is used elsewhere on site. The array will offset 877.2 kg of CO<sub>2</sub> a year, adding up to 21.8 tonnes over 25 years (the guaranteed lifetime of the system) and 34.8 tonnes over 40 years (the anticipated lifetime).

### **Powys County Council - County Hall PV Installation**

The Council's mechanical and electrical engineers worked with a local renewable energy company to design and install the PV system. The company dealt with most of the PV grant application process. The PV installation only took a matter of months, including planning. There was some minimum disturbance to some Council meetings whilst the support framework for the modules was fitted.

There are 84 120 Wp modules; Kyocera KC-120-2, in eight strings, and connected to four inverters fitted to the south-facing roof, designed to complement the building's design. A digital display board has been installed in the foyer of the County Hall detailing the current power output and cumulative generation.

## Project/spin-offs

### **Cheshire County Council - Kingsmead Primary School**

The building has stimulated design options for future schools and other developments in Cheshire; the council are stipulating sustainable construction as a requirement in tender specifications. The County Council also has sustainable construction and design guide documents which help to enforce the principles of sustainable construction and design through the planning process.

### **Gloucestershire County Council - Wilderness Centre**

The PV system has significant educational value especially as the centre monitors and displays its carbon emissions, showing the impact of the PV system. The Centre has gone on to install a 100 kW wood pellet fired heating system to replace its oil boilers and solar water heating. The Wilderness Centre also manages the Plump Hill field study centre and has installed demonstration systems for PV, solar water heating and a roof mounted wind turbine at the centre. Gloucestershire County Council is increasingly considering renewable energy within its capital programme and now has an increasing portfolio of micro-generation projects on its properties.

### **Powys County Council - County Hall PV Installation**

Powys County Council continues to work closely with the local company on both a wood fuel energy services company and the Eco-Valley Partnership.

## Contact, sources of advice

### **Cheshire County Council**

Further information can be found on the school's website: [www.kingsmead.cheshire.school.co.uk](http://www.kingsmead.cheshire.school.co.uk) and from the Cheshire Renewable Energy Initiative (CREI) website: [www.cheshirerenewables.org.uk](http://www.cheshirerenewables.org.uk).

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### **Daventry District Council's Solar Plan**

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### **Wilderness Centre Eco-House**

### **Powys County Council - County Hall PV Installation**

#### **Environmental information:**

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- Printed on Era Silk FSC 75% recycled paper. REGENSW March 2007