

Low carbon case study no. 1: Uclan non-domestic solar PV and CHP



About the project

The University of Central Lancashire (Uclan) is committed to reducing its environmental impact and becoming one of the greenest universities in the country. The University wanted to consider ways of generating its own low carbon energy on its main Preston campus. This has led to the installation of a number of low carbon technologies:

- 270 Sharp Monocrystalline 180 watt solar photovoltaic (PV) modules on the roof of the Students Union.
- 216 Sharp Monocrystalline 180 watt PV modules on the roof of Uclan's Media Factory building.
- 2 solar tracking stations which are the first and only commercial scale dual axis tracking arrays in the UK.
- 7 micro Combined Heat and Power (CHP) units installed across the Preston campus.

About the renewable energy technologies installed:

The solar PV modules work by photons within daylight hitting the panels and reacting with electrons in the panels solar cells. The newly energised electrons create an electric DC current which is sent to an inverter and converted to AC current which can be used in the universities buildings.

The solar tracking stations have a hydraulic system which allows them to track the sun to maximise the capture of solar rays. They are fitted with a wind monitor so that if the wind speed is too fast the panels lie horizontal.

The micro CHP units use fossil fuel to generate electricity but unlike a standard power plant they capture the heat which is also generated and supply it to the universities buildings. This makes it a more efficient way of using fossil fuels and is therefore considered a carbon reducing technology.

CO₂ emissions saved

The manufacturers of the CHP units estimate that each unit saves 12,674 kg CO₂ per year. It is estimated that the solar trackers save 6,134 kg CO₂ per year.

Source of grants

Energi Investments Plc installed the PV modules and were able to secure a 50% grant from the Low Carbon Buildings Programme Phase 2 (now closed) on behalf of Uclan.

Capacity

The PV modules on the student union have a capacity of 48.6 kWp. The Media Factory has a capacity of 38.9 kWp.

The Benefits

- The University has reduced its carbon footprint.
- By generating its own energy, Uclan is reducing its reliance on energy from the grid thereby reducing its costs.
- The solar tracking stations and solar roof modules are linked to public displays which show how much energy is being produced and how much CO₂ is being saved. This increases awareness of environmental issues and raises the profile of Uclan as a green university.
- The technologies are being used as an educational resource by the University.

Key Issues to consider

- CHP is best used in buildings that require long and consistent heating periods to maximise efficiency. The campus buildings are linked together on an energy grid so if there is limited demand in one building energy can be transferred to other buildings.
- There is limited maintenance required for the PV modules and CHP units. The hydraulic system of the solar tracking stations will require some maintenance.
- The tracking stations cannot function effectively if the wind speed is too high.

Further Information

Uclan's Environment and Sustainable Development activities

www.uclan.ac.uk/sustainability

Energi Installations plc (installers of the PV modules and solar tracking stations)

www.energiplc.co.uk

Baxi-Senertec UK (the CHP installers)

www.baxi-senertec.co.uk

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