Green Parkland - *green energy*

FOCUS feature GREEN ENERGY

Set in ten acres of Norfolk parkland, the Kings Lynn Caravan and Camping Park is green in every sense of the word

Whilst the guests enjoy the surroundings the facilities that keep them comfortable are as sustainable as they can be. The Park has won a place in Green Tourism Business Awards for its approach to this important part of its offering to the public.

The Park is open all the year so that first class heating and especially hot water provision is essential for its guests. When the new facility block was built in 2010, Daniel Yallop the owner of the Park set a brief to ensure the best service for his customers but with the lowest possible carbon footprint.

Specialist renewable energy contractors, EnergyWorx2, looked first at the type of renewable energy that would fit with the demand pattern of the Park's guests and the need to ensure large volumes of hot water at peak periods. Also they had to bear in mind the need for regular care and maintenance of the hot water services. Key factors here were the cost and safety issues of guarding against *Legionella* infections within the hot water distribution and especially the shower system.

Pick the right energy

As the majority of the demand for hot water is during the summer solar thermal was the preferred choice for tackling this part of the requirement. This fitted in well with the building of the new block as solar panel could be built into the roofs during construction. In all 27 sq metres was installed which EnergyWorx2 calculated should provide around 65% of the summer time hot water load using the sun's free energy. Solar panels were installed around three sides of the building giving a good coverage of the most useful orientation of the sun; to the East, South and West.

To provide further energy an air source heat pump was installed which can top up during non-sunny days and through the winter. In addition the solar assists the heat pump to run the heating system in the block via underfloor heating. Air source heat pumps extract heat from the outside air, typically giving around three or more units of heat for every unit of electricity used to power them. This combination of solar and heat pumps meant that no boiler back up from gas or oil was required on site.

The Ratiotherm Oskar multilayer storage vessel.

The facility block at the Kings Lynn site.

Getting systematic

As important as the renewable energy sources was the method of control and downstream system applied. This centred on the Ratiotherm Oskar multilayer storage vessel. Rather than just storing water the Oskar ensures that any energy provided by the solar panels and heat pumps is used to its maximum efficiency. Imagine a watery multilayer sponge cake with the hottest water available at the top and lower temperature water in each lower layer. The top layer provides the hot water to plate

◆ An aerial view of the facility block showing roof-mounted solar panels.

heat exchangers serving each of the banks of showers and taps with the controls of the exchangers holding the water down to a safe 48 deg C even though the solar store may be in the 90's deg. C. A circulating system provides the water at the shower heads on demand.

In-built safety

Shower heads in facilities like leisure and camping grounds are at risk of *Legionella* infection as the shower may remain unused for many days or weeks. The surest way of ensuring that bacterium do not form in the system is a daily purge of water over 62Deg C. At the Kings Lynn Park this is provided by a small electric flow heater built into the system which, when instructed by the system, injects a slug of the higher temperature water around each block of showers. This approach says Daniel has saved a tidy sum in energy costs. "Each session of *Legionella* cleaning costs us a few pence rather than pounds it would need if we had to heat to whole 2000 litres up to 62deg. C"

Daniel is able to keep a close eye on how the system is performing as each part is monitored and data logged. This can give an hourly daily or weekly record of demand and how the renewable sources are performing. The system data is live in 'real-time' on the Internet at; http://81.149.179.52:99/GRAFIK.htm

Though the heating and hot water services give the greatest scope for energy saving in the Park Daniel has not overlooked other potential eco saving devices. Lighting is as far as possible provided by low energy lamps and movement sensors turn these off when the site is quiet. Sunlight also helps with the lighting as well as the water heating. Solar tubes are fitted in each block which directs sunlight into the facility via a tube with a reflecting surface. Water use is carefully controlled with a maximum shower time setting. Further water saving comes from rainwater being used to flush the toilets.

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"From our guests point of view scarcely any of the effort and cost for being sustainable is visible. That's how it should be; they are not coming here for a lecture on energy. What I am quietly pleased with is that every guest has probably consumed 75% less energy than they do at home and of course it is good for my bottom line," reflects Daniel.

RESOURCES

EnergyWorx 2 Tel: 01704 211708
Web: www. ratiotherm.co.uk