Case study

RESOURCE EFFICIENT SCOTLAND

Growth that doesn't cost the earth

Carbon Neutral Exemplar – Castle Semple Visitor Centre

The Castle Semple Visitor Centre in the Clyde Muirshiel Regional Park has become a showcase building for Renfrewshire Council. It aims to be a carbon neutral building and to raise awareness of energy efficiency technologies with the 80,000 visitors to the centre.

Key Facts

- Undertaken by the Energy Management Team
- Phased implementation of energy efficiency measures starting with changing light fittings
- Upgrading lighting cost £6,660 with a payback of 4.5 years
- Photovoltaic panels to generate electricity and Solar Thermal panels to generate hot water cost £30,000; overall payback of 9 years
- Programme also includes Lighting Controls, an Air Source Heat Pump and Heating Controls
- On-going programme as new technologies become available and feasible.
- Funded from the Energy Efficiency Fund established by Renfrewshire Council to implement energy efficiency projects

Background

As part of its Carbon Management Plan, Renfrewshire Council has made a commitment to reduce its carbon footprint by 25% of its 2008 baseline by 2014. As part of this commitment, the Council decided that a site to showcase energy efficiency technologies was required. The Castle Semple Visitor Centre provided an ideal location; it attracts 80,000 – 90,000 visitors a year and could be used to raise awareness of energy efficiency and provide practical demonstrations of technologies.

Process/Methodology

Key Steps

For the individual projects implemented so far the key steps have been to:

- Analyse the existing energy consumption of the building and identify where savings could be made
- Understand the potential costs of each energy efficiency option
- Identify a specific area (e.g. lighting) and consider the business case for implementation – the specific capital costs, what cost savings could be made, and what the payback period would be
- Tender for the individual technologies
- Implement the measures
- Monitor the energy use and success of the measures.

A Phased Approach

The Castle Semple project has taken a phased approach. So far the Energy Team has:

- Upgraded fluorescent tubes from T8 to T5
- Introduced lighting controls in low traffic areas
- Implemented heating controls to limit the time the heating is on
- Installed an air source heat pump in the café area
- Installed Photovoltaic and Solar Thermal Panels.

Stakeholder engagement

Throughout the project the Energy Team has worked closely with the Clyde Muirshiel Regional Park. The park and the Council have a shared vision for energy efficiency, the park's objectives are to encourage and enable learning and to promote and foster environmentally sustainable development; which aligns with the aims of the Visitor Centre. The Team found that the staff at the Visitor Centre were a captive audience. This meant that there was buy-in to the measures implemented and more successful results.

Key Outcomes

Craig Doogan, Energy Team Leader, says that raising energy awareness was the key driver for the project not the financial savings that could be made. The Centre is a hub for the public, local community and schools to learn about the environment and understand how to reduce their fuel bills and ultimately their own carbon emissions. The Council is currently rolling out Photovoltaic (PV) technology in some schools in its jurisdiction and is using Castle Semple Visitor Centre to demonstrate the technology in practice.

The benefits

The benefits realised through this project include:

- Enhancing the reputation of the Council
- Providing transferable information, education and skills to the community

- Demonstrating what can be achieved with an existing building – it is a good example of a retro-fit project
- Technologies that don't need active management by staff on site
- The Visitor centre has become an exemplar site for people to visit and learn about energy efficiency.

The carbon and cost savings of the overall project have not yet been calculated; however Table 1 shows, for each individual project, the estimated costs, savings and payback.

This is an on-going programme. For each project the best available technology at the time was used.

Therefore, to remain exemplar, cutting edge and to showcase the most current technologies the project will be work in progress for some time.

Next Steps

There are plans in place to replace the fluorescent lights with LED (light-emitting diode) for further energy savings and they are considering replacing the heating with a biomass boiler that would use a self-sustaining source of fuel - woodchip from the woodland in the regional park. Once the boiler is installed, it is expected that the building will be carbon neutral. A wind turbine is also being considered, and the regional park is planning to purchase electric cars for use in and around the grounds. Any excess electricity generated by the wind turbine could be exported to the grid and used to offset the electricity used by the electric cars.

Priority	Recommendations	Estimated annual savings			Estimated cost (£)	Payback period (years)
		(£)	CO_2 (tonnes)	(kWh)		
1	Wood pellet boiler (100kW) and wet radiator system	7,923	34	66,568	57,000	7.19
2	LED lighting throughout	508	3	5,362	3,000	5.91
3	15 kW wind turbine	8,405	15	28,750	35,000	4.16
TOTAL		**16,837**	**52**	**100,680**	**95,000**	5.64

Table 1 Castle Semple Carbon Neutral Options 2013, Carbon Trust, Feb 2013

Top Tips

1. Undertake site visit to obtain good quality initial baseline data
2. Break into smaller, more manageable projects
3. Engage with the building users
4. Get a budget in place which can be utilised going forward
5. Site selection is crucial to maximise impact and exposure

"*Furthermore, collaborate with partners – collaboration with the regional park and establishing a good partnership and working relationship has been key to the success of the project so far*" Craig Doogan, Renfrewshire Council