

## Overview

**City of Cardiff Council (CCC) is using Re:fit in order to optimise the energy efficiency of certain properties, improve their building performance, reduce CO<sub>2</sub> emissions and save money. Re:fit was seen as an ideal approach to contribute to the Council's desire to be an exemplar in energy saving and carbon management and meet CCC's stringent carbon-management objectives.**

The Council is involved with a number of European projects promoting energy-saving and water-saving initiatives, and was the first authority in Europe to publicly display the energy consumption of its built estate (via the internet). It is also the first organisation in Wales to contract through the Re:fit framework.

With more than 300 properties in the Council's property portfolio and an energy spend of £10 million per annum, the potential benefits could be significant. The first tranche of CCC's Re:fit programme covers eight properties, including City Hall, a range of schools and the historic Cardiff Castle.

The Council commissioned Local Partnerships to support the development and delivery of its Re:fit project. This included the development of the project scope, production of the tender documents and support through the evaluation and contracting process.

The Re:fit project will deliver significant improvements across the initial buildings including:

- upgrades to the Building Energy Management System for each property
- improvements to the heating and heating-control systems
- lighting upgrades, including installation of LED lighting
- generation of renewable energy through the use of solar PV.

The success and approach of Re:fit has led to solution development work commencing on a further 18 properties as part of a rolling programme of energy-savings retrofits.

<b>Project:</b>	City of Cardiff – Phase 1	
<b>Savings:</b>	£166,000 reduction in energy spend per annum 22% net reduction in annual energy costs	945 tonnes of CO <sub>2</sub> per annum saved (24%)
<b>Value:</b>	£1,230,000*	Simple payback of 8 years
<b>Timescale:</b>	Installation completing in 2017	
*Part of £4 million City of Cardiff Re:fit programme		



*“Senior management and politicians are keen to realise savings across the Council's portfolio. The Re:fit project is an exciting opportunity to help deliver ambitious energy savings and contribute to the 35 per cent reduction in greenhouse gas emissions across the Council's built estate by 2022, identified by the Carbon Reduction Strategy. This project also supports the ideal of cost-neutral investments and setting the exemplar for other organisations in the city and across Wales to follow.”*

**Adam De Benedictis, Energy Manager, City Operations, City of Cardiff Council**

## Summary of Energy Conservation Measures (ECMs)

The project encompasses a wide range of energy-efficiency measures. These are listed below.

### Building Energy Management Systems (BEMS)

This involves initial work to ensure correct performance of existing controls and the addition of building-specific systems where most appropriate. The next stage covers remote management and continuous commissioning to ensure that buildings perform in accordance to occupancy requirements and are continuously optimised to reduce energy wastage.

### LED lighting upgrades

This involves the installation of high-efficiency LED lighting, either through the retrofit of LED lamps into existing fittings or the complete replacement of fittings where cost effective. This approach ensures that the works are as cost effective as possible through maximising the lifetime of the existing assets. Due to the extensive life expectancy of LED lighting over the existing installed lamps, there is a significant annual maintenance cost saving to be realised in the future by less-frequent lamp changes and the immediate effect of new lamps throughout.

### Energy-efficient fans

By replacing the existing fans, the same air volume can be delivered while significantly reducing energy consumption. A feedback loop will allow fan speed to be modulated, adjusting air volume to meet the requirements of a varying load, further reducing energy consumption. As well as reducing power consumption, this measure will reduce maintenance by eliminating belt drives.

### Tea boiler controls

Although a fairly minor Energy Conservation Measure, beverage boilers are often core components of office life and can have high-usage levels. Therefore, new controls that provide hot water without unnecessary out-of-hours heating will enable lost cost and small, but very visible, energy savings to be made.

### Solar PV

On-site renewable-energy generation is provided through more than 200kWp of high-efficiency roof-mounted solar PV at two schools. This reduces the amount of electricity procured and provides an ongoing income stream. It also provides a highly visible improvement that can form the basis of educational activities.

### Valve jackets and thermal insulation

There are more than 30 plant and boiler rooms across the eight Phase 1 sites. All of them are due to benefit through tailored thermal insulation jackets and certain sites will see poor pipe lagging addressed. This is a low technology measure that helps to support basic energy-management good practice.

## Energy efficiency and financial savings through Re:fit

Re:fit is a procurement framework and support service available to all public sector organisations in the UK. Since 2009 it has been helping organisations to deliver “spend-to-save” environmental retrofit projects that both improve their buildings and, importantly, make substantial guaranteed financial savings.

For more information about the National Re:fit Programme, contact [robert.mckinnon@local.gov.uk](mailto:robert.mckinnon@local.gov.uk) or phone 07920 702 297.