



PROJECT SUMMARY:



CLIENT

Dundee City Council

PROJECT

Energy Conservation

TIMESCALE:

Jan 2018-June 2018

CONTRACT VALUE:

£1.7m

OVERVIEW

Dundee City Council has already undertaken extensive work to lower its carbon emissions and has achieved a 25% reduction since 2010. The council were looking to reduce emissions by a further 1,000 tonnes per year through identifying and implementing a range of energy conservation measures.

The project, was procured through the Scottish Government's Non Domestic Energy Efficiency (NDEE) Framework and

was valued at £1.7m. We were selected to identify and implement the best package of measures. Vital Energi provided an Energy Performance Contract which guarantees minimal performance in a number of key areas such as carbon reductions and financial savings. This benefited the Council in that they were able to transfer most of the technical and financial risks as Vital Energi guaranteed the minimum payback period.

CHALLENGE

Dundee City Council identified eight of their premises which would benefit from energy conservation measures and these ranged in age from just 2 years old to over 100 years old. After winning the contract, Vital Energi worked with Dundee City Council to further develop their plans and overall identified 46 separate self-funding energy saving measures.

The buildings receiving the upgrades were high energy usage premises and included the Olympia Leisure Centre, Dundee Ice Arena, Central Library, The Crescent, Unit T Claverhouse, Dundee International Sports Centre (DISC), McManus Galleries and Gellatly St. Car Park.

We identified that installing a 50kW

Combined Heat & Power Engine (CHP) in the Dundee Ice Arena would generate significant financial savings and carbon reduction. CHP engines burn gas to generate electricity and then use the heat created during this process to provide heating to the arena, offices, changing rooms, the function suite and the bar/café.

The CHP will save the council 206,000kWhr per year which equals almost 50 tonnes of CO2 reduction. Financially, the engine delivers strong savings, generating over £16,000 of savings per year and by the end of the projects lifecycle it will not only have paid for the initial capex investment, but also generated a significant savings. The other energy generation measure

THE BENEFITS:

- > 1,000 tonnes of carbon reduction which equates to 20% of the client's carbon emissions for the buildings included.
- > Financial savings resulting in payback in just over 7 years at which point the energy conservation measures begin to generate a profit.

- ▶ Part of the works included installing Solar PV panels at three of the Council's premises. These will save 43 tonnes of carbon emissions per annum



“ This project has been a great success for Dundee City Council. The Energy Performance Contract was a new way of working for the Council which has allowed us to make a step change in the scale and speed of installing energy saving measures in our estate. ”

ANDY MARNIE , ENERGY OFFICER - DUNDEE CITY COUNCIL

▶ THE SOLUTION

delivered on behalf of the council was the installation of photovoltaic panels at three buildings. The solar panels will generate over 200,000 kWh of savings and 43 tonnes of carbon reduction per year for the duration of the energy performance contract, and will return the initial investment in 15 years.

Upgrading the Lighting Network to Improve Both Efficiency and Quality.

We have extensive experience of delivering lighting upgrades in busy, public buildings and begin each project by working with the public and stakeholders to minimise disruption. This can be done through various ways, such as working outside of core hours or creating “zones” where disruption is kept to a small area.

Our surveys concluded that lighting upgrades at the Dundee Ice Arena, Central Library, Unit T Claverhouse Building, DISC, McManus Galleries and Gellatly Street Carpark would reduce energy usage by over 600,000kWh/yr per year and would fund themselves in under 8 years, making it the biggest contributor to reducing the council's emissions.

We oversaw the complete replacement of 5,504 fittings and converted a further 2,090 fittings to LED throughout the council's estate with additional units provided to the Council's team for maintenance purposes. They also installed motion sensors where

appropriate, which mean that lights are safely activated and deactivated during times of occupation, which further lowers energy usage. The old fluorescent lighting was removed and disposed of in accordance with Waste Electrical and Electronic Equipment.

Overall the LED lighting saves 659,533kWh and almost 300 tonnes of carbon per annum. Alongside this the lighting system provides savings of approximately £70,000 a year, which gives a total payback period of 7.4 years. Another benefit is a reduction in maintenance.

Reviewing & Upgrading the Heating, Cooling & Ventilation Systems.

Heating, Cooling & Ventilation are three areas where there has been significant technological advancements and not only are the products much more efficient and reliable than previous generations, the controls are more sophisticated in handling the complex needs of a building to ensure optimal comfort levels at all times.

The heating infrastructure was old enough to warrant several upgrades. At the Olympia Leisure Centre we were able to recommission three boilers. This process involved checking essential areas such as safety, but also ensure if it is set up to achieve maximum efficiency. If a boiler hasn't been commissioned for several years its efficiency can be severely reduced and commissioning is

a cost effective way to achieve savings.

Another upgrade involved replacing 10 boiler burners with modern equivalents at the Dundee Ice Arena and McManus Gallery. On its own this upgrade will generate 62 tonnes of CO₂ reduction each year.

While the Council's cooling infrastructure was relatively modern, there were still opportunities for improvement. We were able to replace two air conditioning units with modern units at DISC as well as the upgrade of fans in the air handling units at two buildings.

At the Dundee Ice Arena the perimeter exits were allowing heat to transfer between areas which resulted in the air conditioning being activated more often than necessary. Our solution was to replace 22 fire door exits throughout the building which stopped the heat leakage and reduced the need for air conditioning. Whilst this was one of the smaller upgrades, it still generates savings of 77,000kWhr each year and is a good example of how Vital works to identify every saving possible. All savings are also independently verified by 3rd party experts.

Since the completion of the first phase, Vital Energi have been awarded “Basket 2” which will see them deliver further energy conservation measures across the Council's estate.