

# Trinity College, Cambridge ESOS Review

**CLIENT** Trinity College

**SECTOR** Education

**ADDED VALUE** The work was 28 man days for ERA's work and 6 for the Lead Assessor. When finally billed ERA only charged 22.5 man days

**The College was founded by Henry VIII in 1546 and is now the largest college in Cambridge. The College has 180 Fellows, almost 700 undergraduates and 400 postgraduates. The college employs approximately 360 people. The college also has the benefit of a substantial endowment fund.**

Under EU legislation any organisation that is not publically funded and employing more than 250 people was obliged to undergo an Energy Saving Opportunity Scheme (ESOS) review by 5th December 2015. This involved reviewing all areas of energy consumption, across all the assets owned by the organisation. The ESOS review only covered expenditure where, if savings could be identified, these savings would accrue to the organisation.

The College's Junior Bursar, Dr Rod Pullen, whose principal responsibility is the day to day > ERA Success Story Trinity College, Cambridge ESOS Review practical operation of the college, instructed Expense Reduction Analysts to conduct the review. The review was undertaken by Michele Keeves as project leader and Ian Morrison as energy audit specialist.

## THE COLLEGE ESTATE

The core estate consists of extensive listed buildings off Trinity Street, in the centre of Cambridge, to house students and Fellows. Outside the immediate college environs the remainder of the students and Fellows are housed individual terraced properties and purpose built modern student accommodation elsewhere in the City.

## THE ISSUES

The following matters had to be considered:

**Group structure.** The college is the qualifying entity. However, it consolidates its investment property

holdings (part of the endowment fund) in several subsidiary companies and includes them in the energy. These include investment in Felixstowe Docks and Dunsfold Airfield.

**Which of the college's assets need to be included in the review.** Undergraduate accommodation is all included but with post graduates the college charges the individual with a proportion of the energy costs and these needed to be analysed to see if they needed to be included or not.

**Application of the De Minimis rule of 10%.** A number of options were considered around the final 15% of energy costs to see which could be included in the 10%. The De Minimis proportion was then excluded from the review and this reduced the cost of the exercise.

**The Chapel.** Rod Pullen asked if we could come up with recommendations to minimise the energy consumption in the winter. He had experimented with turning off the heating at night and turning it on the next morning. However the volume of air is so great it took too long to heat up.

**Constraints of the listed nature of most of the buildings.** The college is undertaking a major refurbishment of part of the college. This includes state of the art energy controlling equipment. This will set the yardstick as to what can be done. The college took many months to persuade the listing authorities to allow double glazed window units to be used without affecting the visual impact of the Grade 1 listed buildings.

**The start of the academic year.** The review had to be done promptly before early October when the students were to arrive. This would ensure that all the examples of student rooms could be inspected.



It would be more cost effective to build a new college from scratch, on agricultural land owned by the college outside Cambridge, and turn the historic buildings into a Disney style tourist attraction in the centre of the City, but that would change the very nature of Cambridge. That is, however, impossible.

Dr Rod Pullen,  
Junior Bursar, Trinity College

## THE PERFECT CLIENT

The college is the ideal client to benefit from an ESOS review for the following reasons:

The listed nature of the majority of the college's buildings mean it can be expensive to undertake all the work needed to achieve the maximum savings. The college has resources, but needs to prioritise to achieve the optimum results. This is an example to owners of listed buildings throughout the country as to how it can be implemented. Similarly Trinity challenged the listing authorities to make the point that modern energy saving technology can fit into historic buildings and not undermine the objectives of listing, thereby maintaining working buildings as "fit for purpose".

Trinity's approach is also instrumental in achieving the optimum results. It takes the view that the benefit of decision making now should be seen in the quality of the buildings in 50 years' time. This means that the college will continue to provide good quality, state of the art, working space for students to occupy for the foreseeable future whilst recognising that students will inevitably cause a fair amount of wear and tear to the buildings. Rod Pullen made the comment early on that, "It would be more cost effective to build a new college from scratch, on agricultural land owned by the college

outside Cambridge, and turn the historic buildings into a Disney style tourist attraction in the centre of the City, but that would change the very nature of Cambridge. That is, however, impossible."

## THE PROCESS

The review was split into two stages:

**Phase 1 was a scoping exercise.** This confirmed that Trinity was required to have an ESOS review and confirmed the assets owned by the college that needed to be included.

The reference period of 12 months was chosen and the Lead Assessor selected.

An initial review of the different areas of energy consumption and whether or not they needed to be included was undertaken.

Data that was available from the college's records was included and an analysis of where and how gaps in the information could be filled.

Finally it set the number of man days required to complete the review split between ERA and the Lead Assessor.

**Phase 2 to 5 to complete review.** ERA completed the data gathering aspects from a number of sources with the help of Fran Pocock, Rod Pullen's Assistant. The results were analysed to determine where the De Minimis line should be drawn (Phase 2). This was signed off by Rod Pullen.

A site visit was made to Dunsfold Airfield for the final data gathering exercise (Phase 2).

Phase 3 involved selecting samples of buildings/accommodation to do an energy audit on, with ERA undertaking site visits to determine energy consumption profiles, identify energy saving opportunities and finally present recommendations.

At the conclusion of the review an ESOS evidence pack was handed over to the client.



**THE RESULTS**

The saving that offered the most immediate opportunity was Dunsfold Airfield (Jeremy Clarkson's Top Gear production location) where there was an unidentified shortfall. The remainder will be dealt with by the college directly and may include the appointment of an energy manager. The report also recommended the continuing automation of as much of the estate as possible with a building management system which would integrate energy meters and allow for data analysis, mainly for heating and lighting. This would be done in conjunction with devices like occupancy and light level sensors to control lighting.

ERA also came up with a number of specific recommendations for minimising energy consumption in the chapel.

The original quote for the work was 28 man days for ERA's work and 6 for the Lead Assessor. When finally billed ERA only charged 22.5 man days.

<b>ENERGY SAVINGS OPPORTUNITIES</b>	<b>ENERGY SAVING (KWH'000)</b>	<b>COST REDUCTION (£'000)</b>
Lighting (Electricity)	544.6	47.0
Heating, boilers and insulation of pipework (Gas)	780.2	20.0
Behaviour awareness (Gas) – Awareness programme/upskilling employees	552.2	14.2
Behaviour awareness (Electricity) – Awareness programme/upskilling employees	166.3	14.4
Management information – Heating data	552.2	14.2
Dunsfold Airfield	1,008.3	70.0
Felixstowe Docks – Lighting (Electricity) – Replace at end of life	81.8	7.1
<b>Total saving opportunities</b>	<b>3,685.6</b>	<b>186.9</b>
Original cost of all bar the De Minimis exclusion (£900.6K full level of costs)		842.5
Potential percentage saving		22.2%