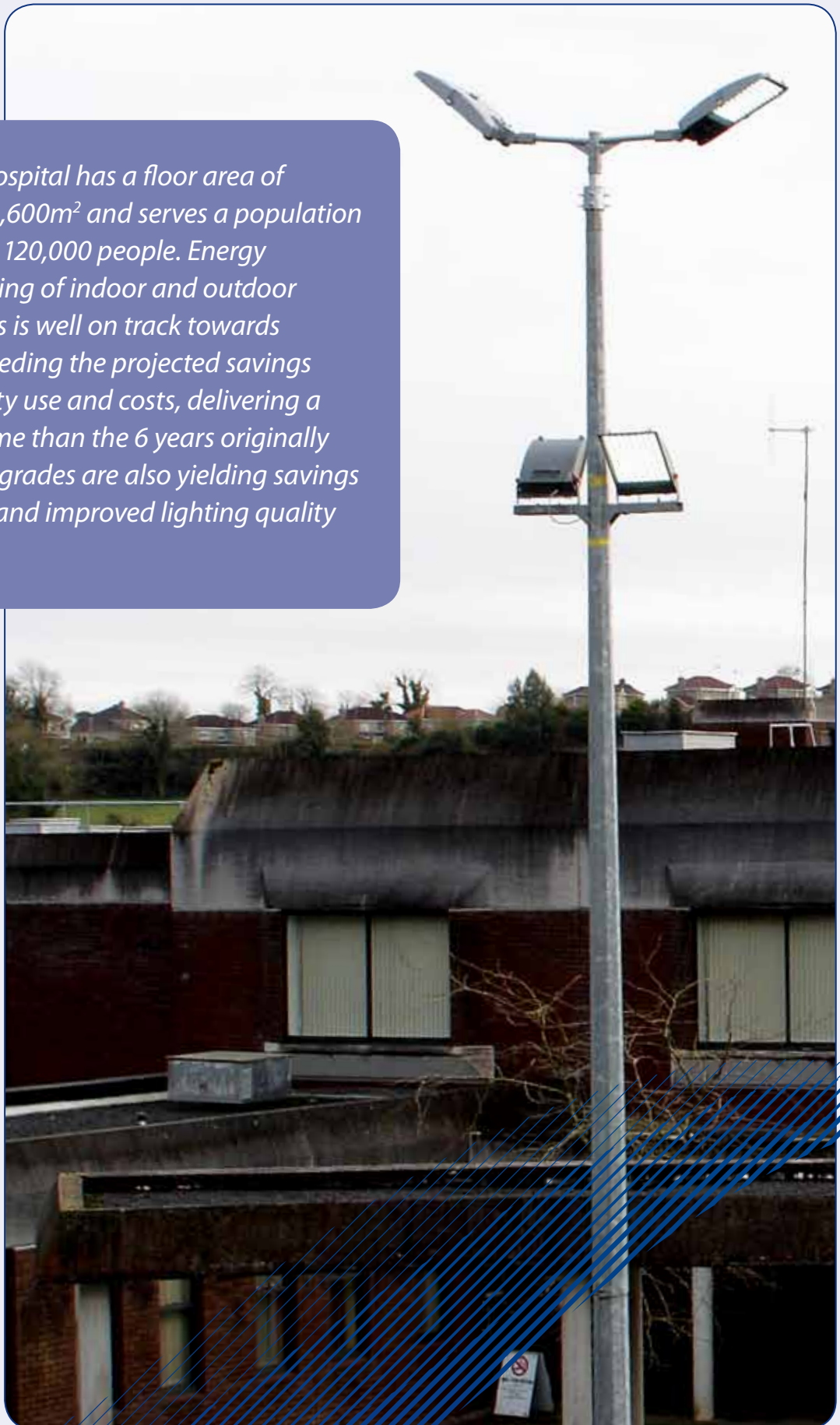


New Life for Old Lights at Cavan General Hospital



Cavan General Hospital has a floor area of approximately 16,600m² and serves a population of approximately 120,000 people. Energy efficiency upgrading of indoor and outdoor lamps and fittings is well on track towards achieving or exceeding the projected savings of 7% on electricity use and costs, delivering a faster payback time than the 6 years originally projected. The upgrades are also yielding savings on maintenance and improved lighting quality and ambience.



Introduction

Cavan General Hospital, situated in a green field site on the outskirts of Cavan town, is a single storey building with a floor area of approximately 16,600m². The hospital provides acute medical services to Cavan County and adjoining areas serving approximately 120,000 people.

Looking to the SEAI scheme of Support for Exemplar Energy Efficiency Projects (SEEEP), the HSE identified an energy efficient lighting upgrade as being the preferred project solution. Apart from a quick payback on the investment it had the merits of a quick project turnaround time, confidence in proven technologies and positive benefits and awareness for hospital users.

Project Overview

The scope of the lighting energy efficiency upgrading in this project was confined to the installation of significantly more energy efficient lamps and fittings for both indoor corridor lights and controls and for outdoor streetlights. The efficiency improvements have resulted in a saving of 7% in electricity consumption.

This prioritisation was influenced by a concern to minimise disturbances to healthcare services.

Early indications are that annual savings from these measures will exceed €30,000, achieving a faster payback time than the 6 years originally projected.

Technology Specification & Installation

Outdoor Lighting Project

The existing streetlight installation consisted of globe type 150W HPS lamp standards. As well as having inefficient ballasts these lanterns had very poor light output due to aging and yellowing of the diffusers, with over 50% of the lumen output being lost. Furthermore, much of this light was directed sideways and upwards, not downwards. The light distribution pattern on the ground was circular which was not ideal for road lighting as the light was not being directed to where it was needed, on the road and footpath.

Other exterior lighting consisted of 500W and 1000W halogen and metal halide floodlights.

The solution was to replace 150W HPS globe lanterns by streetlight lanterns with high frequency long-arc low-pressure mercury discharge lamps, 55W PL-L. Through a combination of these new high light output lanterns and appropriate light distribution design it was possible to provide good lighting levels at less than a third of the wattage previously used. An added benefit is the higher colour temperature which gives a less yellow, more natural light, and much improved colour rendering. The long start-up time of HPS lamps is also eliminated and the new fittings do not contribute to sky pollution.

In addition, the inefficient halogen floodlights were replaced by 100W and 120W LED floodlights. Adequate lighting levels have been achieved at between 12% and 20% of the power i.e. 80% less energy than used previously.

Added benefits are reduced maintenance costs and an improvement in CCTV image quality.

Indoor Lighting Project

Corridor lighting consisted of 600x600mm 4x18W T8 fluorescent fittings. Light output was poor due to aging diffusers. They were in continuous use at all times despite adequate daylight being available through windows along parts of the corridor. These fittings incorporated 9W PL night lights.

Lighting in the main reception lobby was also targeted; these consisted of downlights with 60W incandescent lamps.



The solution here was to replace a total of 445 sets of 4x18W T8 fittings with 3x14W T5 fittings. The higher efficiency of the T5 lamps/electronic ballasts combined with a higher light output through the new diffusers has allowed a saving of 50% in circuit watts to be achieved per fitting with an improvement in lighting levels in corridor areas.

The 9W PL lamps incorporated into the main fluorescents were replaced by separate 2W LED nightlights. To ensure that the amount of artificial light output is appropriate to the amount of daylight present, daylight sensors are incorporated into each fitting. This eliminates the wastage of energy as fittings automatically turn off where there is sufficient daylight.

The highly inefficient incandescent lamps were replaced by 12W LED downlighters. An 80% reduction in power was achieved in the reception area.

Added benefits are an improved working environment and lower maintenance costs.

Benefits

Estimated annual savings from the project at inception were 250,000 kWh or 7% of total electricity consumption for the hospital, saving 134 tonnes of CO₂. This estimate did not take into account the benefits of daylight sensing on the corridor fittings as this is difficult to predict.

Recorded data on electricity usage before and after the installations show that electricity usage is down 9.7%. On this basis, the project should easily deliver the target 7% overall reduction.

The originally calculated savings outlined above are the expected savings for direct replacement of the previous lights with new and efficient equivalents. In reality the savings could conceivably be higher for the following reasons. Firstly, the calculations did not take into account savings that will be attributed to corridor lights operating with daylight sensors. Secondly, the light level in the corridor areas has been vastly improved resulting in a light level of 200 lux being achieved in some corridor areas with a reduced number of light fittings operating. It is therefore envisaged that the ultimate savings will significantly surpass the projected savings.

In addition, the new lamps and fittings result in lower maintenance costs.

Lastly, there has been a very positive response from visitors and reaction from staff across all disciplines to the improved lighting aesthetics.



Project Team

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