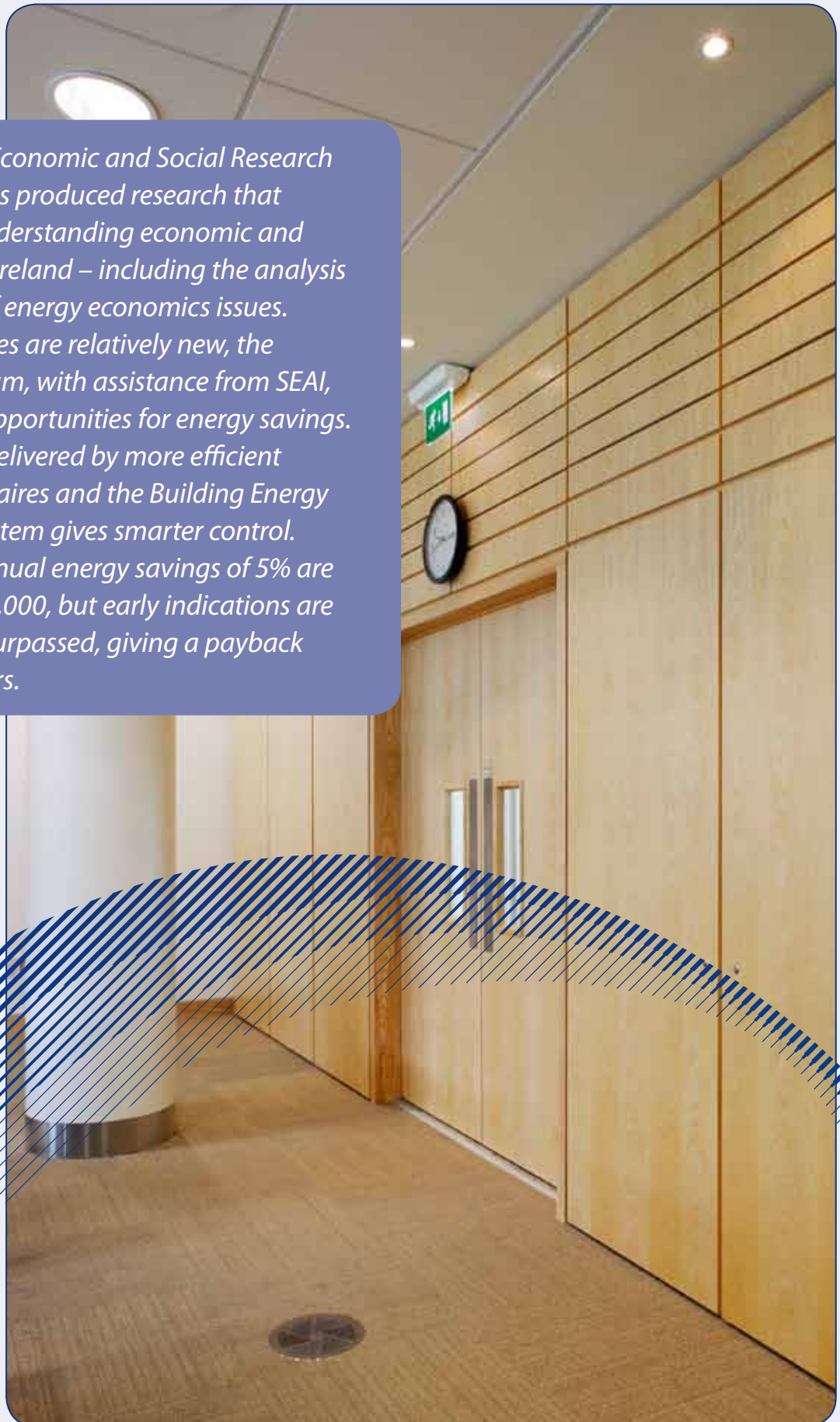


Energy review leads to savings at ESRI



For 50 years the Economic and Social Research Institute (ESRI) has produced research that contributes to understanding economic and social change in Ireland – including the analysis and modelling of energy economics issues. Although its offices are relatively new, the management team, with assistance from SEAI, has found new opportunities for energy savings. Lighting is now delivered by more efficient lamps and luminaires and the Building Energy Management System gives smarter control. The predicted annual energy savings of 5% are worth close to €6,000, but early indications are that this will be surpassed, giving a payback period of 4-5 years.



Introduction

ESRI moved to its new 5-storey office building in Whitaker Square, Sir John Rogerson's Quay, Dublin in November 2006. The building provides accommodation of 2,340m² with a mixture of open-plan offices, cellular offices and various meeting/lecture rooms serving 110 ESRI staff with one floor being sub-let to tenants.

The Docklands Business Forum (which brings together organisations and businesses in the area) set up an environmental subgroup to look at ways in which members can reduce energy use and CO₂ emissions and ways in which the Docklands area can become greener. One of the actions was to take a typical new office building and to look at ways in which energy savings could be made. The ESRI building was chosen and a review of its energy use was carried out by members of the subgroup. SEAI specialist advisers had separately reviewed the building under the Services to Business programme.

Project Overview

Following through from the energy review, the project supported the reduction of energy losses in two areas identified as having the highest potential for early savings:

- Lighting systems upgrading: This involved installation of movement sensors and higher efficiency lamps and luminaires.
- Smarter control of heating and cooling equipment: This centred on the re-calibration of the Building Energy Management System (BEMS) which automatically regulates environmental conditions and mechanical and electrical services within the building.

The project received funding support from SEAI through the Supports for Exemplar Energy Efficiency Projects (SEEEP) scheme.

Early indications are that annual savings from these investments may exceed €9,000, compared with original projections of €6,000. The bulk of the savings are on reduced electricity usage for lighting and avoided electricity and gas usage by minimising unnecessary use of air-conditioning and heating systems while maintaining a comfortable working environment for staff.

Technology Specification

The original lighting system fitted is typical for modern office space including T8 fluorescent luminaires and 2D compact fluorescent lamps. Office spaces are heated and cooled by ceiling mounted 4 pipe fan coil units served by roof mounted chillers and boilers. In addition to the fan coil system, ventilation air is provided to the office spaces by two roof mounted air handling units. The air is mostly distributed to the space by means of a pressurised floor plenum with floor level diffusers. The building has a dedicated BEMS for internal temperature control.



Upgrade to lighting

In the male and female toilets on all floors, 48 halogen spotlights and 76 twin CFL lights have been replaced with 12W and 7W LEDs respectively. In the lobbies on each floor 62 twin CFLs have been replaced with 12W LEDs.

Passive Infra-red detectors have been installed in the lobbies and adjacent stairwells so the lights automatically come on when someone passes through. Previously the lights were left on day and night as there is no natural light to these areas.

Upgrading of the T8 lighting in office areas was not part of this project, but it is clearly an area of future opportunity.

Heating and air-conditioning

Heating and air conditioning is controlled by a Cylon BEMS installed in 2006. Over time the controls had deviated from design set points and this was identified by the energy audit of the premises. The original installers of the system (Control Technology Ltd) were asked to review the operation of the system and to make any corrective adjustments. Settings were optimised for energy saving. This included correct operation of time-switches and the correct operation of valves and sensors.

Installation and operation

ESRI staff and tenants were kept fully informed about the objectives of the project and the work underway. There was no disruption to normal activities. The new lighting appears now to be well accepted although at first the difference in colour (LEDs are 'bluer' in tone than CFLs) led to comments.

Training for ESRI staff was provided to ensure that the heating and cooling equipment is operated as efficiently as possible to maximise longer term savings.

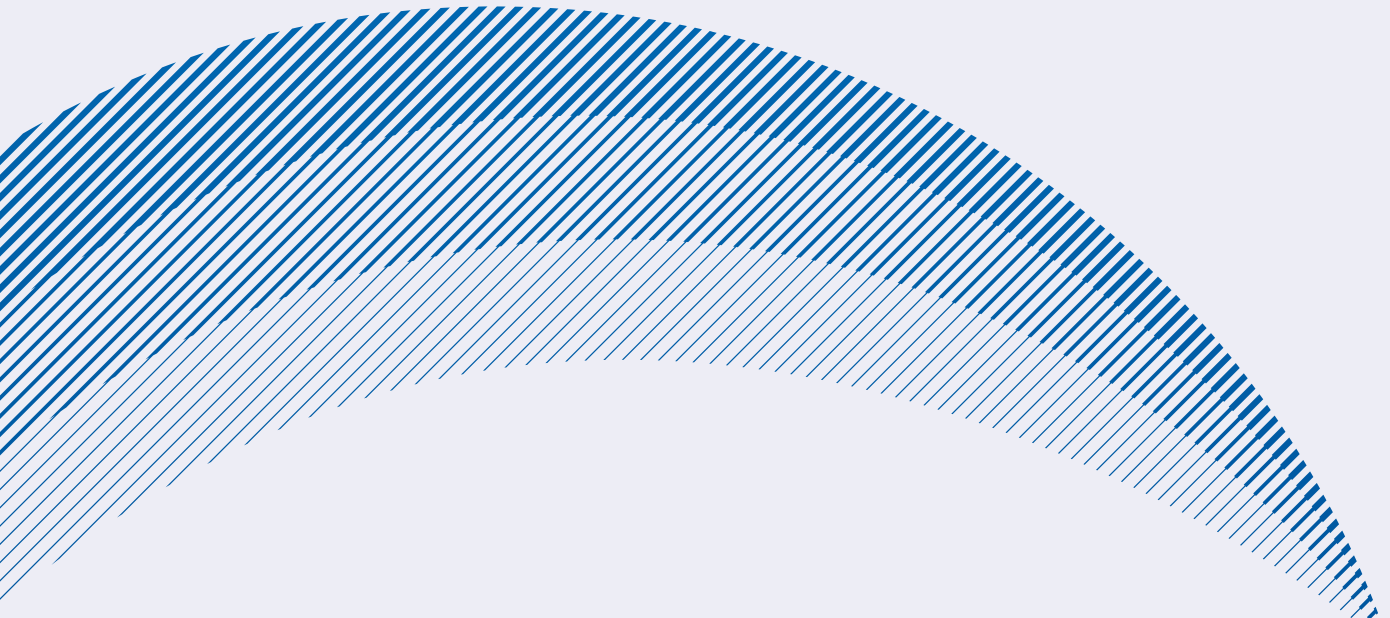
Benefits

The project shows that there can still be significant potential for savings in newer buildings.

Original projections estimated annual savings of around €6,000 from these investments and an overall payback period of 6 years at market rates (before grant support). Early results indicate respective annual savings of 8% and 14.5% on gas and electricity consumption, valued at around €9,000 (€1,400 gas and €7,600 electricity), and thus a payback within 4 to 5 years at market rates.

The bulk of the savings are on reduced electricity usage for air conditioning and lighting, and reduced gas usage for heating. This is being achieved while maintaining a comfortable working environment for staff.

The actions taken by ESRI have been shared with all the members of the Docklands Business Forum Environment subgroup. Energy consumption is being monitored and will be shared with the wider Docklands Forum once the savings achieved can be quantified.



Project team

The project was managed by ESRI and the installation of lighting equipment by Frontline Energy and Environmental. The re-tuning adjustments to the BEMS system were made by Control Technology Ltd.

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