

Innovative approach leads to extraordinary
savings at Friends First



Friends First offices at Cherrywood Business Park, South County Dublin

Friends First provides financial solutions to over 250,000 Irish customers in all walks of life. In a tough economic environment, Friends First has been proactive in reducing its own operational costs so its customers can continue to benefit from a value-based service. Although its current offices are relatively new (2002), Friends First engaged engineering specialists to identify energy-saving solutions and then ensure they were successfully implemented. With grant assistance from SEAI, the offices have enjoyed electricity savings of 28% and gas savings of 40% – together worth over €83,000 in their first year. Subsequent fine tuning by the engineers has increased the rate of savings even more.



Introduction

Friends First moved into the newly constructed Cherrywood Business Park, South County Dublin premises in 2002. Its 7,500m² three storey building has a mixture of open-plan and cellular offices, meeting rooms and a full-service staff canteen. It accommodates nearly 400 staff, including those in a sub-let tenancy occupying half of the ground floor.

Before Ascough Consulting Engineers were engaged, the building's HVAC systems were carefully managed with particular attention to the operation of plant within minimal time schedules. Nevertheless, Friends First was prepared to dig deeper for savings. Following review of the energy audit report from the engineers, it was agreed to implement its recommendations. Some elements were particularly novel, notably the aim of automating the building's heating, ventilation and air conditioning (HVAC) systems so that they 'breathe' with the external environment from one season to the next.

Project overview

The energy audit identified a number of areas where energy savings could be made. The recommendations centred on lighting and HVAC; the payback period for the lighting alone was estimated at about four years. However, it was considered that the reduced cooling load arising from the lighting changes would be best harnessed in conjunction with additional controls applied to the building's building management system (BMS). The proposed HVAC amendments included additional variable-speed drives (VSDs) to pumps and fans, extra sensors and a series of novel control algorithms for the BMS.

While the capital cost of the HVAC changes was relatively minor, they were the most complex part of the works to implement successfully – but they delivered the most savings, especially when the reduced cooling load due to the lighting changes was harvested. An improved Comms Room cooling strategy is also being implemented in order to complete the energy-saving measures recommended by the energy audit.

The new approach to building control via the BMS needed finetuning after installation, particularly during the first six months. In general, the savings have progressively incremented month on month since the installation was completed in January 2010 (see Fig.1).

The lighting and HVAC changes were supported by an SEAI grant and, including the grant, have resulted in a net payback period of 1.8 years.

Technology specification

Upgrade to lighting

The office lighting previously used T8 technology and was switched manually. This was replaced with modular T5 luminaires in the office areas and LED downlighters in circulation areas. A Dali Philips Lightmaster control system was installed to maximise savings through motion detection, daylight linking and zoned time scheduling.

Heating and air-conditioning

The air-conditioning system outputs were scaled back to reflect the newly reduced load. VSDs were applied to the chilled-water pumps and additional temperature sensors were strategically applied at key locations on the chilled-water system. A similar approach was applied to the heating system. Collectively, their outputs are managed automatically through several extra layers of bespoke control

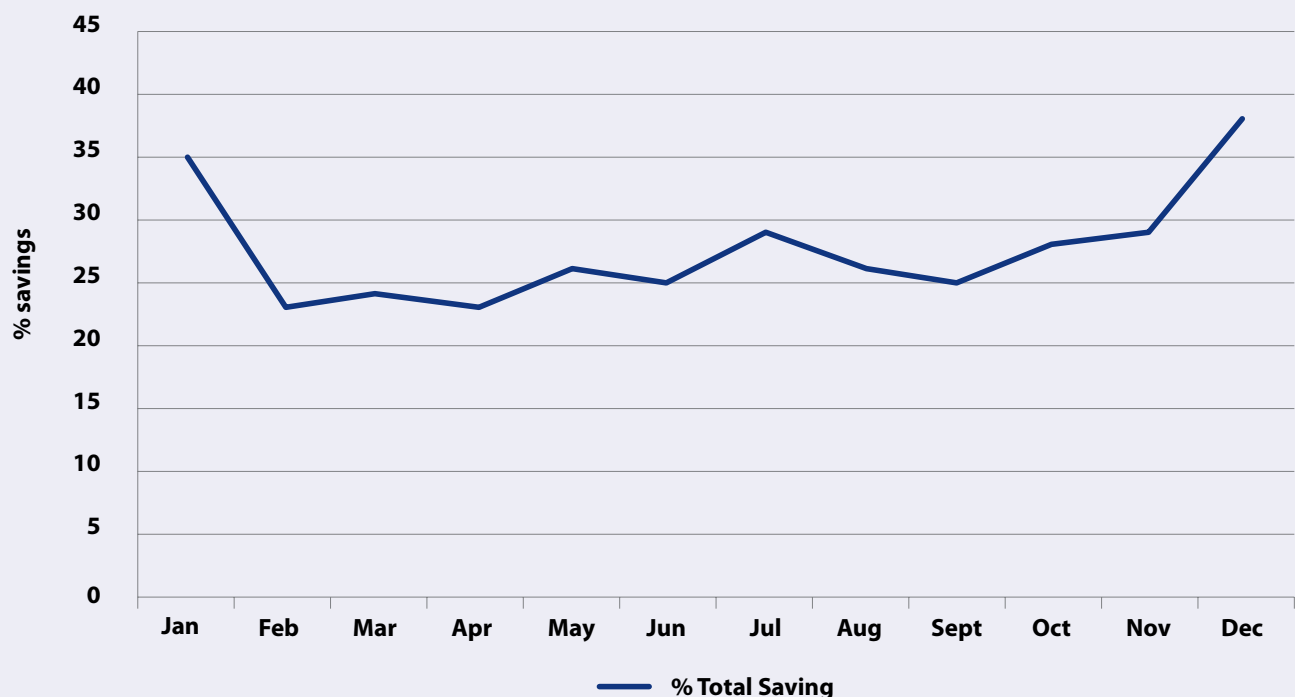


Figure 1: Monthly Electricity Savings

algorithms programmed into the BMS. The HVAC system, including that serving the canteen, now operates in a manner that uses beneficial outside weather conditions as the first preferred option for tempering the indoor environment.

Installation & operation

A plug-and-play approach was taken with the lighting installation. Double-plug-ended cables were prepared off site. The luminaires were likewise equipped with plug-in connections so the replacement system could be implemented expediently after working hours.

The HVAC changes didn't require any system shutdowns and all of the associated works occurred in the plantroom.

The works were completed on time and below budget.

The successful operation necessitated an iterative approach as the input variables to the new BMS control algorithms needed to be calibrated for each season. Most of the finetuning was completed in the first six months after installation. However, Ascough Consulting Engineers continued to monitor the system closely throughout its first year of operation.

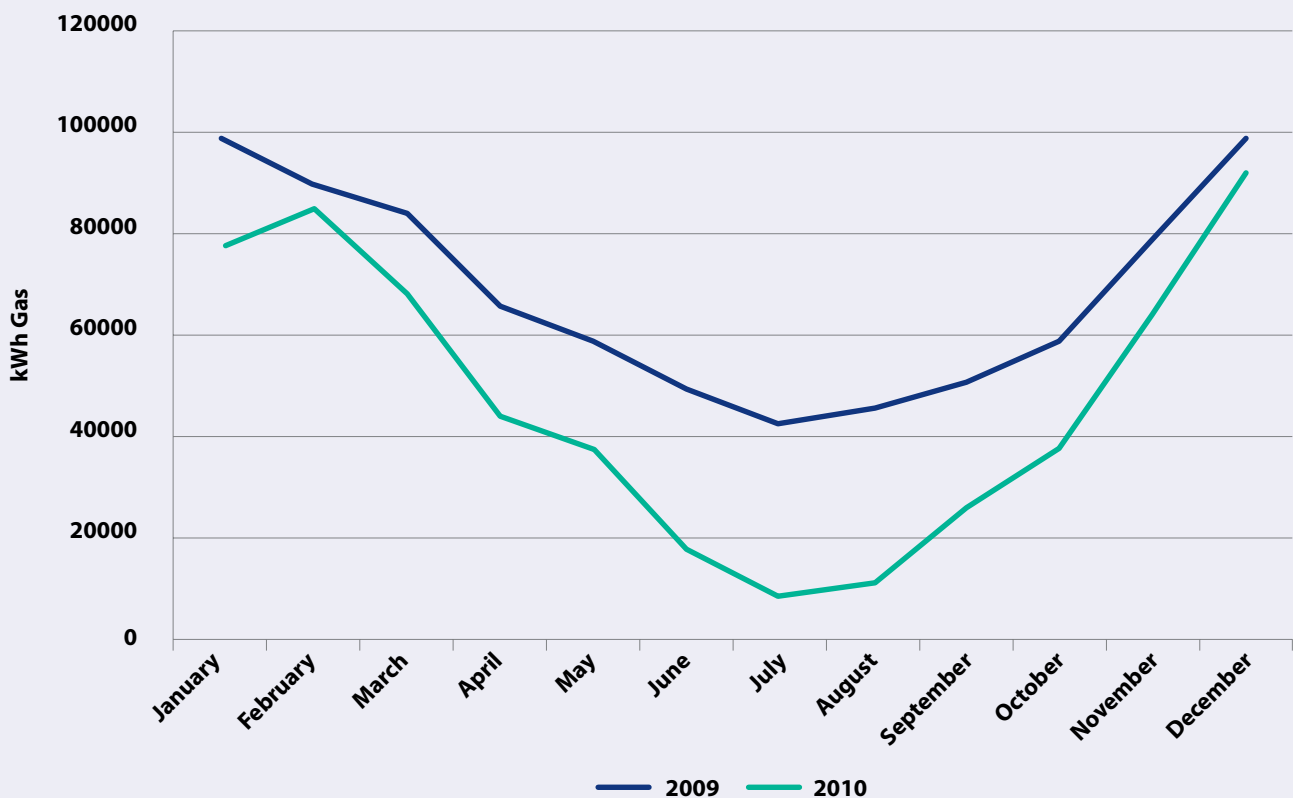


Figure 2: Monthly Gas Consumption

Benefits

Analysis of two successive 'before and after' annual cycles up to February 2011, allowing for singular weather and usage patterns in December 2010, shows that the electricity savings total 28%, and the gas savings 40%. It was observed that the rate of savings in the final six-month monitoring period increased due to system finetuning (see Fig. 2). In this period, the savings were 30% for electricity and 50% for gas (July to December data) (see Fig. 3).

This project shows that extensive savings with short payback periods can be achieved even for modern well-managed buildings. This type of performance upgrading is achievable by drawing on appropriate expertise, and applying a holistic scientific and practical understanding of building physics and equipment technology. Using such expertise, very positive results can be realised, with minimal disruption to the business of the occupier.

Other benefits include increased longevity for the HVAC plant (part load operation) and reduced maintenance costs on the lighting system (longer-life lamps, fewer lamps, emergency testing via PC).

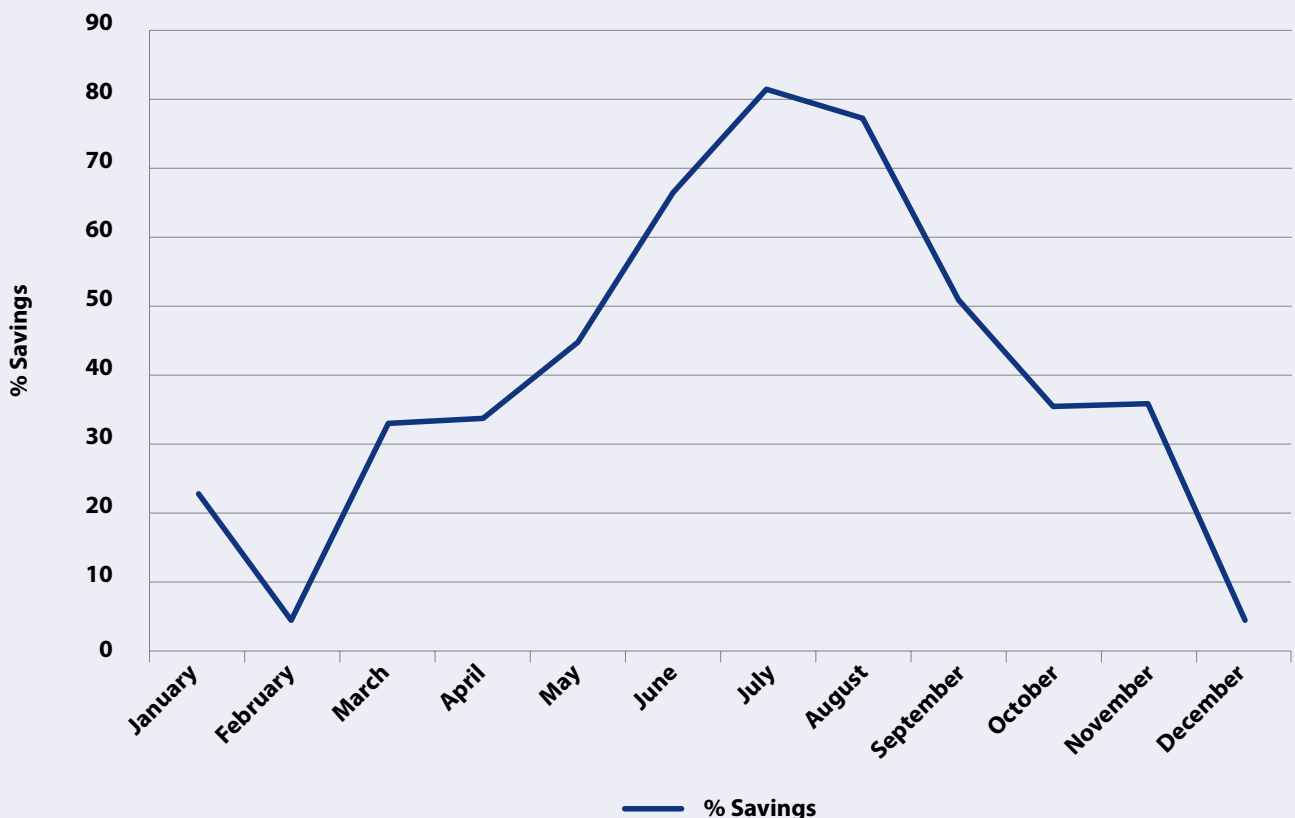


Figure 3: Monthly Gas Savings for 2010 – Temperature Adjusted

Project team

Engineering, controls programming and project management was provided by Ascough Consulting Engineers. The lighting installation was by Philips Lighting, and the HVAC changes were carried out by Standard Controls.

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