



Case Study

Jacob Fruitfield food group, Ireland

Abstract



Jacob Fruitfield is one of the major Irish producers of biscuits & treats, sauces, and jams & preserves, with extensive production facilities just outside of Dublin. Back in 2004, the company adopted an energy monitoring solution to learn about its energy consumption in an energy intensive production environment. Documented in this study is the impact that this application has had on business processes within the company, and in particular the organisational assimilation of an energy monitoring application. Understandings generated provide important lessons for other organisations that intend to adopt energy monitoring solutions. One of the key lessons learned from the Jacob Fruitfield study is that energy education is crucial for the successful assimilation of energy monitoring applications in organisations.

Case study fact sheet

■ Full name of the company:	Jacob Fruitfield Food Group
■ Location (headquarters / main branches):	Tallaght, Dublin, Ireland
■ No. of employees:	406
■ Year of foundation:	2004 (Food Group), parts of the group have been trading since 1851
■ Main business activity:	Production of biscuits, jam and confectionary
■ Primary customers:	Supermarkets, Wholesalers & Food Service
■ Turnover in last financial year (€):	€ 106.6 Million
■ Most significant market area:	Ireland, UK, Europe & USA
■ Main e-business applications studied: *	ICT and energy saving (Implementation and amalgamation of an energy monitoring solution)
■ Case contact person:	Natasha Whyte (Fitzgerald), Energy Manager

Background and objectives

In 2004, the Jacob Fruitfield Food Group was created from a merger of two previously unrelated companies: Fruitfield Foods and Irish Biscuits. Spanning back some 150 years, both of these previously unconnected firms have long traditions in the making of biscuits, sauces, jams, and confectionary. With these strong historical roots in Ireland, the company nowadays prides itself as having become 'an integral aspect of Irish society'. Brands sold by the food group today include 'Fig Rolls', 'TUC', 'Cream Crackers', 'Kimberley', 'Mikado', 'Coconut Creams' and 'Oat Crumbles' in the biscuit and treats range; 'Fruitfield' and 'The Real Irish Food Company' in the jams and preserves range;

and 'Chef' in the sauces and pickles range. The company's target market is the fast moving consumer goods market. Its main customers are Tesco, Dunnes, Superquinn, Supervalu, Londis, and Musgrave's. The challenges faced by the company in maintaining and expanding its existing market share come from both its competitors (United Biscuits, Foxes, and Heinz) and an increasing manufacturing cost base – mainly due to increasing raw material and energy costs.

e-Business plays an important role in the running of the food group. Various applications are employed throughout the business such as EDI (Electronic Data Interchange) used by the Customer Service department for the receipt of orders from the various customers and sales representatives, and EPOS (Electronic Point of Sales) data by the Marketing department for development of marketing strategies. Furthermore, Jacob Fruitfield Food Group has adopted an energy focus system which measures and monitors energy consumption at its manufacturing facilities. The focus in this study is on the organisational assimilation of this solution at the Tallaght production site, illustrating how energy monitoring has become an integral part of Jacob Fruitfield Food Group's activities. The production facility at Tallaght comprises of one large production building, an adjoining warehouse, an office block and a free standing compressor room. The total area of the premises is approximately 42,140 m². Two main sources of energy are used on site: electricity - used for lighting, motive power for production machinery, compressors, refrigeration, ventilation / extraction, battery chargers and miscellaneous use; and natural gas – used for baking ovens, raising steam for process and washing purposes, space heating for the factory, warehouse and offices and for raising domestic hot water.

e-Business activities

The energy monitoring solution, which was supplied and installed by EFT Control Systems Ltd in 2004, primarily shows how much gas and electricity is consumed on the manufacturing site. The application is connected to a set of 3 primary meters and 34 sub-meters across the facility. The three primary meters are a gas meter, an electricity meter and a water meter. Sub-metering for the gas cycle include a baking meter and a heating meter. The heating meter is subdivided into metering for steam boilers, factory air handling units, offices and changing rooms. The electricity meters are installed at the onsite sub-stations and at the air compressor room. The Group produces its own compressed air which is one of its most electricity intensive processes: the conversion rate from electricity to compressed air is only about 15%. The readings collected from the gas and electricity metering system are transferred to the computer application on a 15 minute basis. This application enables the user to gather readings at various times by 'clicking in and out' of the various meters. In terms of electricity the company has established that 300 kilowatt is the base load level. This level rises to well over 1000 kilowatt during the day, going down to approximately 750 kilowatt during the evening shift.

The energy information system process at Jacob Fruitfield Food Group rests upon the following components: the meters, the application, the data generated by the application (primarily in meter readings and Excel reports), the information derived from the data generated, the transformation of the information into a form meaningful and useful to human beings and finally activities of human beings that result in reduced energy consumption. Figure 1 illustrates these elements and the sequence thereof.

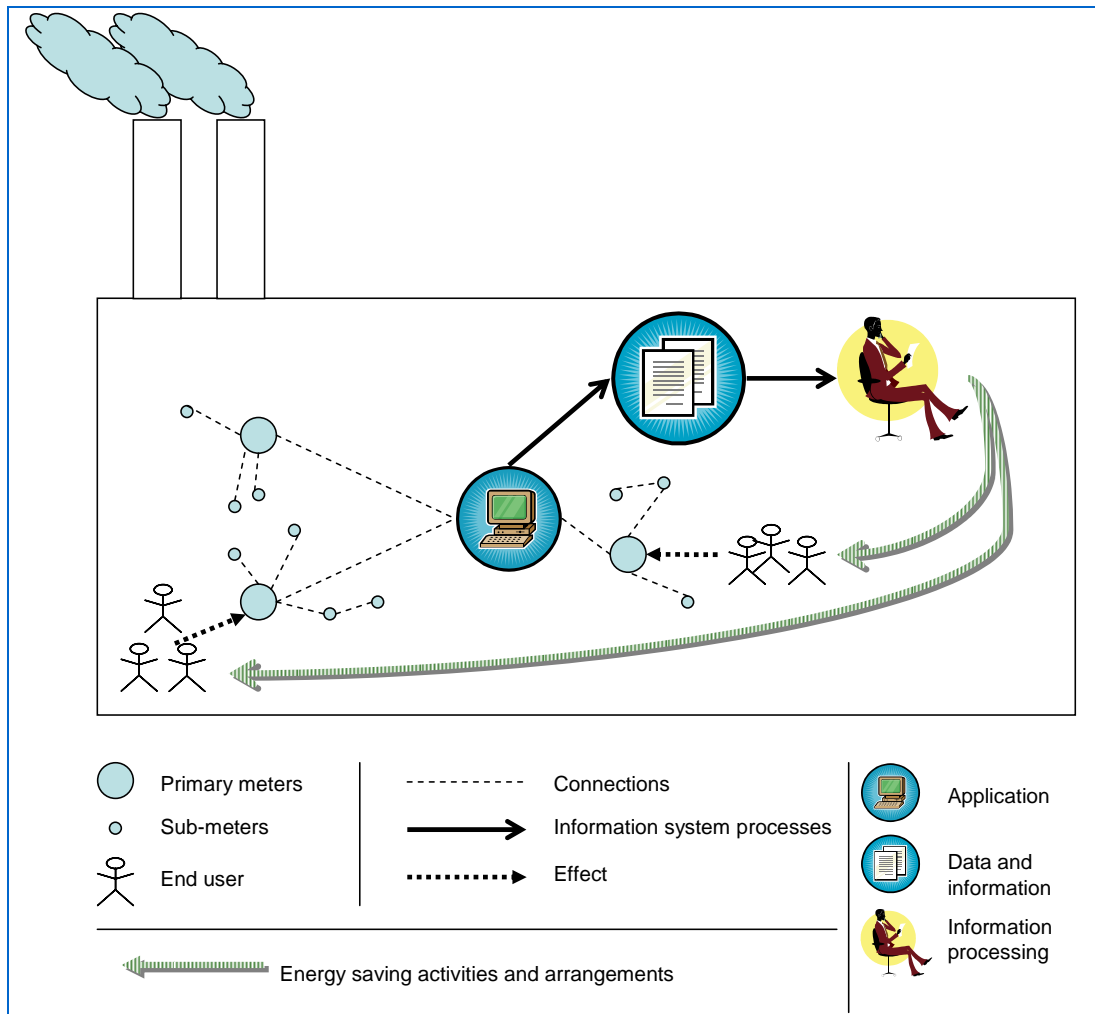


Figure 1: Energy information system process at Jacob Fruitfield Food Group

The energy information system process rests upon an initial step initiated by the company in 2005: an energy audit. The first key stage of this audit was to collect all relevant information. This included an evaluation of bills (electricity, gas, water, effluent etc.) and an analysis of where energy is being consumed at and at what loads. The second key stage was to inform stakeholders and people working for Jacob Fruitfield Food Group about the findings from the first stage. This second stage revealed a strong need for educating people about energy issues. The first two steps showed the need to examine energy consumption patterns in detail. This resulted in the third step which was to analyse and investigate consumption patterns. The final step was to act upon the findings of the analysis and investigation process. The following example illustrates one of the processes of the energy audit:

The evaluation of the gas consumption started with identifying the amount of gas used and where. The energy monitoring application revealed that the majority of gas was used on baking and heating. Baking is a core activity at the factory. The expectation was this would have the greater gas usage. The analysis however revealed that 48% of gas was used on heating. Heating is broken down into steam boilers, air handling, and heating of offices and canteen. On further investigation the company discovered that two processes within the heating system of the factory were working against each other. Extract fans were discharging warm air fed in by the heating system. This insight led (a) to an evaluation why extract fans were used at certain locations within the factory - upon which

it was decided to switch off all the extract fans that are not situated at the end / entrance of the ovens; and (b) to a decision to drop the heating temperature in the factory and use the natural heating regime - heating generated during the production process. The outcome of this gas-heating audit was first, a significant reduction in gas consumption (1.13 million kilo watt hours), second, making use of a production by-product (heating), and third, raised energy awareness among staff who are asked to come forward if they desire temperature adjustments within the factory.

Impact

The assimilation of the energy monitoring solution into the Food Group's ongoing activities is having significant effects on the company. First and foremost it has led to a reduction in the use and consumption of gas and electricity. With the focus on the factory at Tallaght in the first year, the company has managed to reduce gas consumption by 9% per annum. This reduction was mainly achieved by monitoring usage and changing practices at the factory. The next step planned is to focus on water and effluent consumption and other energy consuming sources. The absorption of the energy monitoring application into the company has also led to changes in work processes and the acquisition of new, more energy efficient equipment.

The energy monitoring application enables the analysis and classification of energy patterns: managers can identify hourly, daily, weekly, monthly and yearly energy consumption and act upon changes to these patterns. Furthermore, this data gives the company tangible energy performance indicators. For example, in cases where heating degree days are roughly the same in year x and in year y, then heating consumption should roughly be the same in both years unless performance at the factory was different and there are significant factors unaccounted for. The understandings generated about energy consumption patterns do result in energy saving exercises: one weekend the management team went to the factory and switched off all unnecessary equipment including the lights. The meter readings revealed that the total lighting load at the factory is 84 kilowatt. Considering that at night the average electricity load is 300 kilowatt, the managers realised that just through switching off the lights at night in specific areas the average night-time electricity load can be reduced significantly.

The use of the energy monitoring solution has taught Jacob Fruitfilled Food Group that energy savings can mainly be achieved through educating people and getting them involved in the processes. The level of energy savings will notably increase with the adequate involvement of people. While energy habits are hard to establish, once the process of education has started, education is generally fruitful. The group has learned that the best way to educate end-users is threefold: first, to explain what energy is all about; second, to inform them about energy consumption at the company and beyond; and third, to show them what can be done to reduce energy consumption using real-life examples. The energy manager makes use of various tools to educate staff including, the use of energy notice boards – showing monthly, weekly and weekend usage levels for the various areas / utilities throughout the factory, running energy awareness weeks, putting bright informative posters up around the factory, talking to end-users and trying to form habits in people, giving presentations to supervisors, and emailing all employees about energy issues. This energy education goes beyond organisational boundaries, which the following example illustrates nicely: one of the employees was complaining about floodlights being switched on during a daylight football match referencing energy measures at his workplace. While energy education is a slow process, the Food Group

recognises that it is one of the most important methods to reduce energy consumption. This understanding combined with future energy saving activities such as expanding the audit to other energy consuming matters, enables the company to expand on its energy policy and make significant further savings in the future. The energy monitoring application will remain a core element of the energy saving process at Jacob Fruitfield Food Group.

Lessons learned

The energy monitoring application has become fully incorporated into the regular activities at the production facilities of Jacob Fruitfield Food Group. What this case study shows is that energy savings can best be achieved when computer applications are fully absorbed into ongoing organisational activities. There are many processes that lead to the conservation of energy at a production plant and it is a long and hurdle-some way to identify these and implement changes that lead to energy savings. Core elements of energy saving processes are computer and technical applications that provide accurate data and people dedicated to change work processes based on information generated from the applications. One key instrument in the energy saving approach at the Jacob Fruitfield Food Group is the use of energy audits. Commonly these audits consist of energy pattern analyses, identification of energy intensive matters and searches for most suitable solutions. Yet all these activities are based on effective human involvement illustrating that the success of energy computer applications depends significantly on what people do with the data and information produced by the applications. While organisations can define formal energy processes that incorporate applications, the end user who switches off a piece of equipment when it is no longer needed is at the heart of the energy saving measure.

References

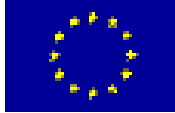
Research for this case study was conducted by Maria Woerndl, empirica on behalf of the Sectoral e-Business Watch. Sources and references used:

- Interview with Natasha Whyte (Fitzgerald), Energy Manager & Total Productive Maintenance Controller, Jacob Fruitfield Food Group, July 10th, 2007, in Bonn/Germany
- Internal documents
- Websites:
 - Jacob Fruitfield Food group, <http://www.jacobfruitfield.com>
 - EFT Control Systems Ltd, <http://www.eft.ie>.

About this document

This case study was initially published as part of a comprehensive Sectoral e-Business Watch study report on "Intellectual Property Rights for ICT-Producing SMEs" (2008). The European Commission, Enterprise & Industry Directorate General, launched the Sectoral e-Business Watch (SeBW) in late 2001 to monitor, study and assess the implications of ICT for enterprises and sectors. The results support policy formulation, notably in the fields of industrial and innovation policy. All study reports and further resources such as data on ICT adoption in enterprises are available online at the SeBW website (www.ebusiness-watch.org).

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