

# Glanbia Gets The Recipe Right

GLANBIA plc is a leading international dairy foods and nutritional ingredients group, headquartered in Ireland. It has operations in Ireland, Europe and the USA, and international joint ventures in the UK, USA and Nigeria.



‘Sustained awareness is vital for maintaining momentum and driving continuous improvement forward’

## The cost of energy and climate change

Glanbia Ingredients, Ballyragget is the largest multi-purpose, integrated dairy site in Europe. It processes a broad range of dairy ingredients. As energy represents 40% of controllable costs, fuel prices and energy efficiency are crucial to the future competitiveness of Glanbia Ingredients. Also, in the context of environmental climate change, Glanbia Ingredients constantly seeks to reduce carbon emission levels.

The primary source of energy at Ballyragget is natural gas, as the combined heat and power (CHP) plant produces electricity and steam for the site.

## Applying the solution

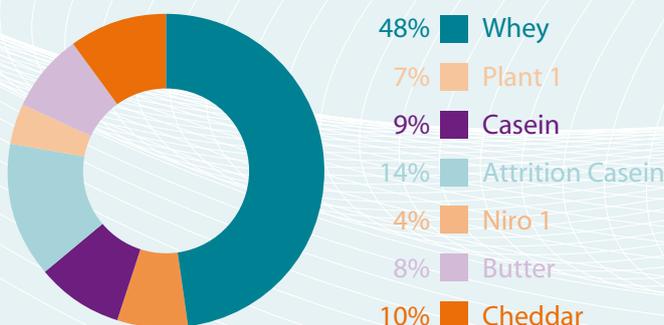
To tackle these issues, Glanbia:

- signed up to Sustainable Energy Ireland’s (SEI’s) Energy Agreements Programme in May 2006
- committed to undertaking a fundamental review of energy use by implementing a strategic and systematic approach to energy management
- decided to implement a structured energy-management system – IS393 – at the facility in line with best practice, to improve competitiveness and minimise environmental impact
- was the first Irish-owned company to have achieved accreditation to the IS393 Energy Management System in May 2007

## Counting the benefits

- Glanbia is an active member of SEI’s Large Industry Energy Network (LIEN) which reports annually on energy usage and reduction of consumption and emissions using an Energy Performance Index (EPI). The target for 2006 was 62. Glanbia achieved an EPI of 59.11, which outperformed the target.
- Driven by a culture of efficiency in all aspects of operations at the facility, the energy management system engages personnel across all departments, using quantitative data and information.
- In 2006 the amount of energy used per processed 1,000 litres of milk decreased, thus showing an increase in overall energy efficiency across the site.

Electrical Usage per Plant KWh: 2006



## Identifying the big energy users

Around 60 GWh of electricity and 225 GWh of steam are produced annually by the onsite CHP plant. A further 3 GWh of electricity is imported from the national grid, while supplementary steam requirements are provided by natural-gas-fired steam boilers. The largest single user of electricity onsite is the refrigeration plant, which generates chilled water for a number of processes. The most energy-intensive



process is whey processing, where the bulk of evaporation and drying takes place. It accounts for 48% of energy consumption.

A sophisticated monitoring and targeting (M&T) package is used. The system measures energy data and key profiles, and feeds these into the budgetary process to allow costs to be assigned to various production areas.

To gain further understanding of the energy breakdown, a quantitative analysis of the data was required. Usage profiles over time were assessed and baseline consumption patterns established. Big energy users could then be identified and their impact on the consumption profile better understood.

## Mapping the flow of energy

An energy-flow model for the plant was developed during the early stages of the implementation process. In a top-down approach, all significant energy flows were mapped, from the utilities to the end users, in a series of dynamic energy-flow diagrams. Niall Weldon, a Glanbia graduate engineer, mapped and generated these diagrams. This involved analysing the PIDs (piping and instrumentation diagrams), breaking the plant down to a user-friendly PFD (process flow diagram) and, with these, carrying out a mass and energy balance around each process. From this work the big energy users were identified and a strategy and register of opportunities were developed.

The resulting spreadsheet-based flow sheets facilitated active interaction with the processes and their associated energy flows. Any energy implications arising from alterations in production processes are automatically predicted through energy usage data. This allows current processes to be optimised.

The register of opportunities forms the basis for the energy services programme. It will ensure that the most energy-efficient modes of operation are implemented. In addition,

the systematic approach ensures that any process improvements are recorded and clearly documented.

EPIs for production-related processes are negotiated with stakeholders after efficiency improvements have been made – for example, a 4.6% reduction in energy consumption has been negotiated with whey production managers for the coming year. EPIs are analysed weekly to ensure that any variation in energy consumption is highlighted and explained. The EPIs are normalised against any variations in production and are reviewed regularly.

In addition, a strategic plan for continuous monitoring of energy profiles was formed. This ensures that efficient plant operation is sustained.

Commenting on the energy plan, John Finlay, the site's Environmental/Energy Services Manager, said quantitative indicators of performance were the key. Without performance data, he added, it would not be possible to drive forward efficient operation practices.

## Bright sparks

Energy efficiency means reducing costs and carbon dioxide emissions. It also raises employees' awareness of energy-saving opportunities at home as well as in the workplace. It quickly became apparent that awareness and communication at every level of the organisation were essential for a fully integrated energy-management system. Glanbia Ingredients, Ballyragget, Environmental Coordinator Audrey Mongan O'Shea says sustained awareness is "vital for maintaining momentum and driving continuous improvement forward". The energy team has run a number of campaigns to raise energy awareness at the plant, such as energy

awareness weeks, an energy quiz, photo competitions, energy booklets and the 'Bright Sparks' initiative.

## Saving by design

The energy-management system ensures that energy-efficient design is now at the forefront in all new projects at Glanbia. Lifecycle economics are considered when any energy-consuming device is bought, whereas in the past equipment selection was based purely on capital economics. For instance, a boiler's attributes (TDS control and blow-down, VSDs on combustion air fans, condensate return, treatment facilities and the installation of an economiser) are being fully explored before any investment decision is made. This lifecycle approach is also adopted when process operations are examined; for example, a process coming online in the near future is currently being reviewed with the aim of reducing water consumption.

The Night Watchman energy initiative was taken onboard by the IT Department, and is applicable to lots of companies. Glanbia computers are automatically turned off outside normal operating hours. The switching back on of these units is staggered through the morning so that the peak morning electrical load is controlled and personnel begin the day's work with computers working at greater efficiency.

According to Glanbia Ingredients Ireland CEO Jim Bergin, "We are very proud to have achieved the IS393. The systems which the environmental team have evolved to achieve this accreditation enable the business to improve energy efficiency, thereby reducing costs. This is particularly relevant in the context of dramatic energy price increases and the impact of climate change."

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