

Kerry Foods

HARVESTS SAVINGS WITH VACUUM-PUMP UPGRADE

The Kerry Group has grown, organically and through a series of acquisitions, to become a global leader in food ingredients and a leading consumer-foods processing organisation in the UK and Ireland.

Launched as a public company in 1986, Kerry Group plc is listed on the Dublin and London stock markets and has a current market capitalisation of about €3.4 bn. It has achieved sustained profitable growth, with current annualised sales of approximately €5 billion. The Group employs over 20,000 people on 200 sites worldwide and supplies more than 10,000 products to markets in over 140 countries.

The Group's consumer foods division, Kerry Foods, represents approximately one third of Kerry's annual revenue and has facilities located in the UK and Ireland. One such facility is Kerry Foods, Wicklow.

The Shillelagh, Co Wicklow plant is a 20,000 m² facility with integrated manufacturing systems, supplying the Irish and UK markets. Here, around 900 employees produce foods under both brand (e.g. Denny and Ballyfree) and private labels.

VACUUM-PUMP SYSTEM RETROFIT

In 2007, Kerry Foods, Wicklow carried out a retrofit on the vacuum pump system used to process their food products. Instead of using one large motor, continuously driving each vacuum pump, it now uses two smaller motors for each. Both motors are used together to build up the vacuum; then one shuts off while the other runs continuously to maintain the vacuum. These efforts resulted in substantial savings in:

Energy	350 MWh per annum
CO₂ emissions	210 tonnes per annum
Water	96,000 m ³ per annum

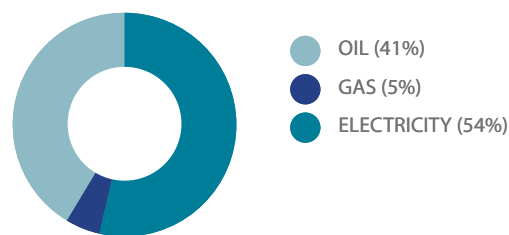
This retrofit was part-funded by Sustainable Energy Ireland's Industrial Best Practice Initiative.

BASELINE ENERGY USAGE INVESTIGATED

In 2007, Kerry Foods, Wicklow conducted an investigation into the most significant users of energy at its Shillelagh site, to identify areas where energy might be saved. This followed a 12% increase in the cost per kWh since 2004.

The baseline study revealed that the site uses 30,000 MWh of energy per annum, 54% of which is electricity. The primary uses of electricity are: refrigeration, vacuum pumps, lighting and compressed air.

Energy use by source



It was clear that energy usage remains constant throughout the year, with a slight peak in the summer months due to the increased ambient temperature and resultant decrease in refrigeration efficiency. The investigation also showed that, in terms of unit cost and CO₂ emissions, electricity was the most significant energy user.

Several projects were carried out to increase refrigeration efficiency; however, from its investigation, Kerry Foods deduced that the area that best fitted the Industrial Best Practice programme was the vacuum-pump system, primarily used for vacuum packing.

THE INITIAL SETUP

The vacuum-pump system ran near-continuously, for an average of 150 hours per week, and accounted for 15% of all electricity used in the factory.

There are 34 vacuum pumps running in the plant: 27 have an 11 kW rating, while the other eight have a 15 kW rating. The 15 kW pumps are liquid-ring pumps, which require 2.5m³ of water per hour to operate. With an annual running time of 6,120 hours, these eight pumps alone use 440 MWh of electricity and 96,000m³ of water per annum.

RECOMMENDATIONS MADE

The energy-efficiency investigation team made several recommendations. The main one was to replace each 15kW rated pump with two dry vacuum pumps. These are more efficient than the existing pumps; the retrofit would increase efficiency and reduce the amount of water used. It was also found that these new pumps would reduce the running time required. It was decided that the 11 kW rated pumps could not be replaced due to the vacuum set-point that they were operating at.

New dry vacuum pump



EIGHT PUMPS REPLACED

In late 2007, Kerry Foods, Wicklow replaced the eight 15 kW-rated liquid-ring pumps with 16 dry 4.5 kW-rated dry vacuum pumps (two to replace each existing wet pump). These are rotary claw-type, dry pumps, designed for either pressure or vacuum applications. Each of these pump pairs operates in tandem to produce significant savings in energy.

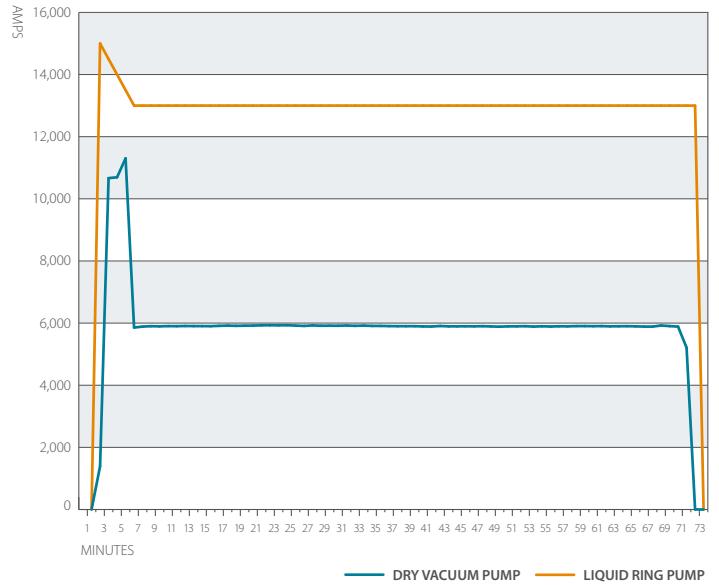
The paired pumps operate together to bring the vacuum up to the required pressure, which varies between processes. When this pressure is achieved, one of the pumps is taken off line, while the other pump modulates to maintain the required operating pressure. The pump in operation can be alternated – which saves on operating time and maintenance costs, and increases the life span of the pumps.

ENERGY USE, WATER CONSUMPTION AND CO₂ EMISSIONS CUT

This retrofit resulted in a reduction in electricity consumption of 350 MWh per annum. The switch from wet to dry pumps means that there is also a saving of 96,000 m³ of water per annum. At current energy and water prices, the payback period for this project is two years and one month (excluding SEI grant).

The reductions of 210 tonnes of CO₂ and in water consumption are the most significant environmental savings accruing from this project.

Dry vacuum pump v's liquid ring pump



MINOR INVESTMENT LEADS TO SIGNIFICANT SAVINGS

Kerry Foods has realised significant savings from a relatively minor investment in time and money. This is a good example of Energy Efficient Design in a retrofit application.

Another encouraging aspect of this project is that the retrofit was relatively straightforward and can be readily transferred to other sites where excessive energy is used in a vacuum-pump system.

Kerry Foods are working on several other projects at present as part of their energy management and reduction program, including: lighting controls, compressed air, refrigeration and energy awareness.

"In 2007 our in-house energy team, consisting of senior personnel from our engineering and maintenance departments, embarked on an ambitious energy-reduction initiative.

Several projects have been implemented across the Kerry Foods, Shillelagh site, targeting the major energy-consumption systems, such as refrigeration, vacuum systems and compressed air system.

The vacuum-pump replacement project implemented in 2007, which was partially funded by SEI, has allowed us to take a major step towards achieving our twin goals of cost and CO₂ reduction for the site."

Ned Phelan,
Business Unit Engineering Manager,
Kerry Foods

Sustainable Energy Ireland

Glasnevin, Dublin 9, Ireland

Glas Naíon, Baile Átha Cliath 9, Éireann

T. +353 1 8369080

F. +353 1 8372848

info@sei.ie

www.sei.ie



Sustainable Energy Ireland is funded by the Irish Government under the National Development Plan with programmes part financed by the European Union.