

RESOURCE EFFICIENCY **CASE STUDIES**



Rialtas
na hÉireann
Government
of Ireland



Environmental Protection Agency
An Ghníomhaireacht um Chaomnú Comhshaoil

**NATIONAL WASTE
PREVENTION PROGRAMME**

Foreword

I am pleased to present this latest set of case studies from the Green Business programme. I hope that they provide inspiration and guidance to other business operators who are looking to generate savings while helping to protect our environment.

Efficiency is a crucial part of successful business. By working with Green Business, the companies featured in this book have realised savings through decreased costs for purchasing, storage and processing of raw materials; along with a reduction in the cost of waste management.

For the environment, there is a further win as by becoming more efficient, these companies have also reduced their environmental impact, through reduced pollution and consumption of finite resources. It also builds sustainability credentials for the business – a critical part of winning new orders and customers, as the many Bord Bia Origin Green members participating in the programme would confirm.

The case studies provided in this book show how companies across Ireland have worked with the Green Business advisors to identify quick, low-cost projects that eliminate wastage across operations and facilities - without compromising the quality of outputs.

Our intention in publishing these case-studies is to provide direct examples of how smart Irish companies have made a difference. I hope that other companies will be encouraged by this to engage with the Green Business process and to start realising efficiencies and savings for themselves.

Dara Lynott
Deputy Director-General
Environmental Protection Agency



Prepared with the support of the Environmental Protection Agency through their BeGreen programme.
www.begreen.ie

Over 300 companies across a range of sectors have made savings. Many of these savings can be achieved at low or no cost.

KERRY FOODS DUBLIN

Financial Benefits:
Cost Savings: €30,000 p.a.

Environmental Benefits:
Water Reduced: 750m³ p.a.
Food Waste Reduced: 112 Tonnes p.a.

p.11

WEXFORD CREAMERY, WEXFORD

Financial Benefits:
Cost Savings: €26,000 p.a.

Environmental Benefits:
Water reduced: 5% p.a.
Energy reduced: 4% p.a.

p.10

ABP FOOD GROUP

Financial Benefits: Cahir Site Only
Potential Cost Savings: €10,000 p.a.

Environmental Benefits:
Waste Reduced: 330 Tonnes p.a.
CO₂ reduced: 9 Tonnes p.a.

p.30

PIG PROCESSOR MIDLANDS

Financial Benefits:
Cost Savings: €42,000p.a.

Environmental Benefits:
Water Reduced: 7000m³ p.a.
CO₂ Reduced: 90 Tonnes p.a.

p.13

ATLANTIS SEAFOOD WEXFORD

Financial Benefits:
Cost Savings: €4,000 p.a.

Environmental Benefits:
Water Reduced: 200 m³ p.a.

p.20

STILLORGAN VILLAGE DUBLIN

Financial Benefits:
Cost Savings: €24,000 p.a.

Environmental Benefits:
Water reduced: 10,200m³ p.a.

p.26

ABP FOOD GROUP

Financial Benefits:
Potential Cost Savings: €150,000 p.a.

Environmental Benefits:
Water Reduced: 70,000 m³ p.a.

p.32

SOFRIMAR KILMORE QUAY CO.WEXFORD

Financial Benefits:
Cost Savings: €20,000 p.a.

Environmental Benefits:
Water reduced: 30% reduction per tonne of product processed

p.22

DUN LAOGHAIRE SHOPPING CENTRE DUBLIN

Financial Benefits:
Cost Savings: €51,147 p.a.

Environmental Benefits:
Water reduced: 63% p.a.

p.24





CG POWER SYSTEMS CO. CAVAN

Financial Benefits:
Cost Savings: €180,000 p.a.

Environmental Benefits:
Energy saved: 2.8 million kWh LPG
CO₂ reduced: 678 Tonnes p.a.

p.6



SLANEY FOODS CO. WEXFORD

Financial Benefits:
Cost Savings: €28,000 p.a.

Environmental Benefits:
CO₂ reduced: 124 Tonnes p.a.

p.14



LA TRATTORIA CO.CORK

Financial Benefits:
Cost Savings: €6,000 p.a.

Environmental Benefits:
CO₂ reduced: 20 Tonnes p.a.

p.16



ATLAS BOX & CRATING, CO.CORK

Financial Benefits:
Cost Savings: €12,368 p.a.

Environmental Benefits:
CO₂ reduced – 27 Tonnes p.a.
Water Reduced: 267m³ p.a.

p.8



BALLON MEATS CO. CARLOW

Financial Benefits:
Cost Savings: 40% Reduction in oil costs
Investment: €47,599
Payback: 36 Months

Environmental Benefits:
CO₂ Reduced: 92%
fuel efficiency

p.12



ISLAND SEAFOODS LTD. KILLBEGS

Financial Benefits:
Cost Savings: €32,000 p.a.

Environmental Benefits:
CO₂ reduced – 137.5 Tonnes p.a.

p.18



IRELAND'S DAIRY INDUSTRY

Financial Benefits:
Potential Cost Savings: €130,000 p.a.

Environmental Benefits:
Reduce BOD Loading: 100 Tonnes p.a.
CO₂ reduced: 350 Tonnes p.a.

p.28

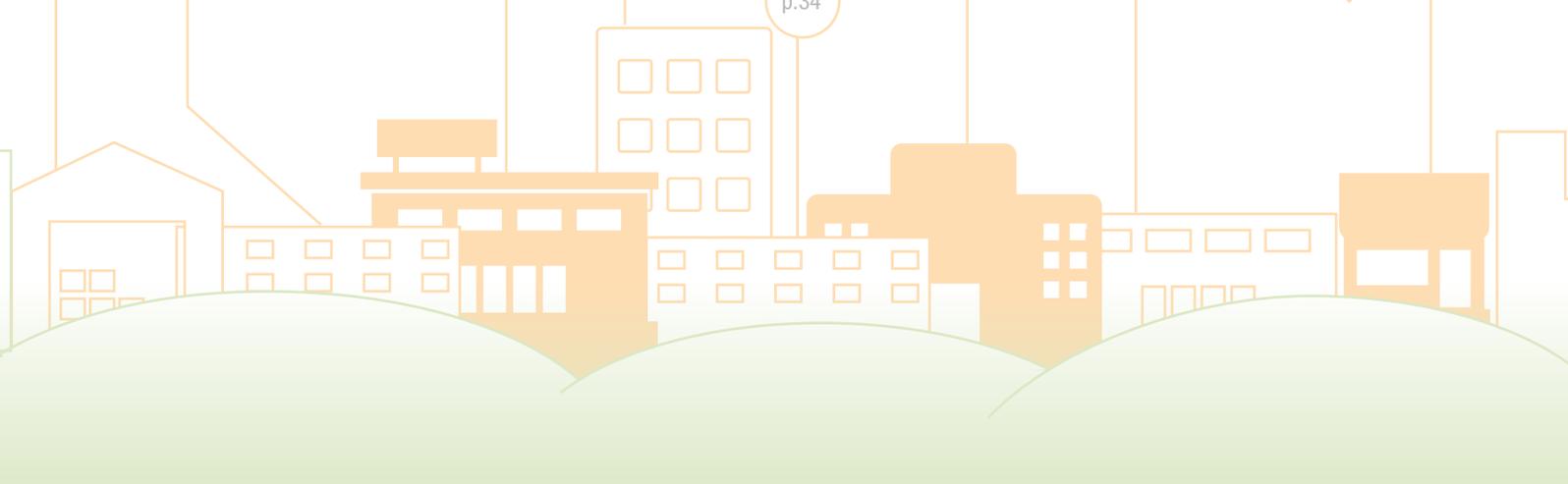


CENTRA CO. CORK

Financial Benefits:
Potential Cost Savings: €13,000 p.a.

Environmental Benefits:
Energy saved: XX p.a.
CO₂ reduced: XX p.a.

p.34



Reducing costs and emissions through heat recovery and oven controls

CG POWER SYSTEMS IRELAND – CO. CAVAN

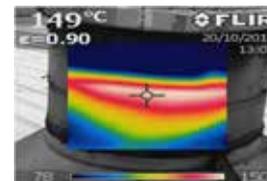


Description of the Business

CG Power Systems Ireland Ltd has been manufacturing electrical distribution transformers at its facility in Cavan since 1977. Employing 465 people, its distribution transformers provide the final voltage transformation, stepping down the voltage to a level used by the consumer.

Project Description

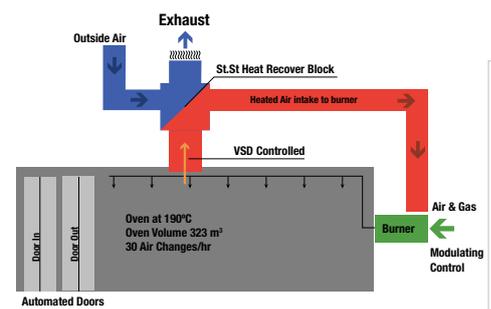
Prior to the project, the paint system was the largest LPG user on-site with an annual usage of 7.4 million kWh costing €500,000, or 65% of annual gas consumption. Operating at a temperature of 190°C, the paint ovens are the primary consumers of gas within the paint system. A temperature of 149°C was recorded by the company from one of the five oven exhausts. A visit by Green Business quantified the losses in the oven exhausts and identified the potential for heat recovery to reduce gas consumption.



CG Power Systems contacted oven suppliers but did not find any who had carried out modifications to recover heat from oven exhausts. CG Power Systems also worked with paint suppliers regarding curing requirements, vapours emitted and recommended extraction rates. Following a feasibility study, grant aid was awarded through the SEAI Better Energy Workplace Programme to increase the efficiency of the oven systems through a number of improvements.

Improvements made:

- Replaced the mechanical high/low burners with fully modulating controllable units to match the variable load requirements for the two ovens.
- Installed variable speed drives in the extractor fans to allow optimal airflow, provide even cure and prevent hot-spots. Reduced and controlled extraction.
- Installed a heat recovery system on the main oven exhausts to capture the flue gas waste heat for preheating combustion air.
- Installed automatic doors to synchronise opening times with the requirements of the system to reduce loss of warm air.
- Installed sub-metering to record fuel consumption to establish a benchmark, identify any areas of concern and quantify the reduction achieved.



The Results

The improvements in the curing ovens have had significant financial and environmental benefits for CG Power Systems Ireland. A reduction in energy consumption provided a cost saving of €167,000 over an 11 month period, reducing the thermal energy required by the ovens by 38%. This corresponds to annual savings of 678 tonnes of CO₂ emissions. As a result of the heat recovery system, exhaust heat was reduced by 50%, increasing the efficiency of the oven and providing a more comfortable working environment by reducing the amount of localised fresh air intake.

The payback on the investment was about 13 months and has resulted in significant annual savings for Sofrimar on their water charges.

Financial Benefits:

Cost Savings: €180,000 p.a.

Payback: 13 Months

Environmental Benefits:

Energy saved: 2.8 million kWh LPG

CO₂ reduced: 678 Tonnes p.a.

Atlas Box and Crating Co. Ire Ltd. save €12,300 per annum through better efficiency

ATLAS BOX AND CRATING – CO.CORK



Description of site

Atlas Box and Crating Co. manufactures bespoke packaging for a range of clients, notably for electronics and computing equipment. The facility in Carrigtowhill, Co.Cork is a modern purpose-built facility, which is at present applying 'Lean Manufacturing' techniques to its processes. Since gaining ISO14001 accreditation in 2008, Atlas has continued to work hard to reduce its environmental impacts while promoting sustainability with suppliers and customers. Each year, new Energy, Waste and Water environmental targets are set.

Resource Efficiency Measures

Between 2010 and 2012 Atlas have implemented a number of Resource Efficiency measures:

- A new building was custom built with energy efficiency in mind. Features include; installing the maximum number of skylights in the roof, and sensor dimmer lights to help maximise daylight. A temperature controlled heating system was installed and sensor lights installed in toilet areas. Solar panels were installed on the roof.
- A review of night-time usage revealed that 1/3 of electricity was being used at night when the factory was closed. A review of electricity consumers at night revealed that operators charged all forklifts at night as a precautionary measure. This had a significant electricity usage, particularly on equipment with poor battery life (often in the case of leased equipment). Now all battery operated equipment have their battery charge logged on a regular basis and are only charged as required.
- The Gas bills were investigated to identify any savings that could be made. The gas line is shut off for 6 months of the year (saving €2,500/year) after it was discovered that Atlas were paying €14 per day to have the line open regardless of usage.
- A doorbell system was installed to ensure roll-doors are only opened when required, in order to prevent heat loss from the building (€600).
- Manual taps replaced push-taps and a sensor system was installed in the urinals rather than 24 hour automatic flushing.



Financial Benefits:

Cost Savings: €12,368 p.a.
 Investment: €1,800
 Payback: 2 months

Environmental Benefits:

CO₂ reduced – 27 Tonnes p.a.
 Water Reduced: 267m³ p.a.

The Results

UTILITY	Annual Reduction	Units/Annum	€ Saved/Annum	€Investment
Gas	35%	6,685 m ³	€3,541	€0
Electricity	11%	29,721 kWh	€3,219	€600
Water	17%	267 m ³	€600	€1,200
Waste	14%	50 Tonne	€5,008	€0
Total			€12,368	€1,800



Reduction in milk solids in waste to effluent treatment plant

WEXFORD CREAMERY – WEXFORD

Financial Benefits:

Cost Savings: €26,000 p.a.

Investment: €0

Payback: Immediate

Environmental Benefits:

Water reduced: 5% p.a.

Energy reduced: 4% p.a.



Description of Property

Wexford Creamery was established in 1963 and is located on the outskirts of Wexford Town. It is part of the Dairy Crest PLC – largest manufacturers of cheese and liquid milk products in the UK. Cheddar cheese, whey concentrate and liquid milk products are produced at the Wexford site.

Project description

The aim of the project was to reduce waste, to increase awareness of waste, and to recycle and reuse where possible. The primary objective was to recover suspended solids from the process wastewater. These are product residues generated by plant cleaning and by accidental losses. As the project progressed the company identified process efficiency improvements that resulted in reduced waste losses, and the recovery of solids using a decanter was avoided. Greater awareness and understanding of staff in relation to product and process losses has also been achieved.

The Solution

The reduction in the waste removal costs of sludge derived from white whey which is now processed, has resulted in savings of ca. €26,000/annum (2,000 tonnes @ €13/tonne). Reductions in water, steam and electricity usage have significance in containing service costs. The creation of an energy monitoring programme has increased awareness of energy consumption and will lead to savings in the longer term.

Freshways

KERRY FOODS – DUBLIN


Financial Benefits:

Cost Savings: €30,000 p.a.

Investment: €5,000

Payback: 2 months

Environmental Benefits:

Water Reduced: 750m³ p.a.

Food Waste Reduced: 112 Tonnes p.a.

Description of Property

Freshways, part of the Kerry Group, make a range of chilled sandwiches and wraps. The site employs 200 people, working on shifts, six days a week. Intensive cleaning of the plant is undertaken daily.

Summary of Project

Managing resources more efficiently following a Green Business site visit identified a number of potential benefits including:

Solution

The site identified a range of recommendations with good associated potential benefits, including:

- Total cost savings of €30,000.
- Reduction of 750m³ of water used on site per annum by the introduction of spray heads and reduced flow on taps for handwashing.
- Reduction of product waste by sale of bread loaf end slices as raw material for bread-crumbs (112 tonnes/annum). This reduced waste costs by €7,500/annum and made an income of €8,000 from the sale of the product.
- Additional potential savings through improved waste segregation, LDPE recycling and the use of larger containers for purchased mayonnaise.

Ballon meats save 40% on oil costs

BALLON MEATS – CO. CARLOW



Financial Benefits:
 Cost Savings: 40% Reduction in oil costs
 Investment: €47,599
 Payback: 36 Months

Environmental Benefits:
 CO₂ Reduced: 92% fuel efficiency

Figure.1 Image of hot water temperature gauge coming from heat exchange.

Figure.2 Refrigeration pack with heat exchange taking heat from compressor and heating boiler feed water.

Description of Business

Ballon meats, a family run business, has been producing Irish meats of the highest quality for over 35 years from their Co.Carlow factory. Situated beside the family farm in Ballon the small factory that started 35 years ago has developed into a world-class plant, processing cattle, sheep and pigs.

Project Description

While product quality has always been a key focus at Ballon, in recent years they have started looking at improving the efficiencies of water and energy use. Due to the nature of the business, refrigeration is the major part of their electricity load and hot water the major part of their thermal load. Consequently Ballon decided to look at harnessing some of the heat given off by the refrigeration compressors to heat the water used around the site.

There are 12 chillers on-site and one large blast freezer and this air-cooled refrigeration system consists of 3 different packs. Hot water, which is used in the process, hand washing and for cleaning is supplied by an oil boiler. Ballon, in conjunction with Murcon Refrigeration, investigated the different options available and decided on installing a compressor desuperheater. This tubular heat exchanger was installed as part of a major refrigeration upgrade and now pre-heats the boiler feed water from approx 13°C to 45°C.

The Result

It is estimated that oil costs for hot water heating have been reduced by approx 35% to 40% and in addition electricity costs are lowered as the refrigeration system doesn't have to work as hard, though this has not been quantified.

Since then Ballon Meats have continued their resource efficiency improvements and recently upgraded their pipe lagging to Armaflex 25mm. This was installed on all pipes throughout the site, both hot and cold, to conserve energy and reduce potential issues during cold weather freezing. While not quantified, the savings from this on hot water costs has been estimated at between 5–10% of the total heating oil bills.

Pig processor could reduce cleaning costs by €42,000 by reducing water flows from hoses

PIG PROCESSOR – MIDLANDS



Financial Benefits:

Cost Savings: €42,000 p.a.

Investment: €0

Payback: Immediate

Environmental Benefits:

Water Reduced: 7000m³ p.a.

CO₂ Reduced: 90 Tonnes p.a.

Description of Property

The meat processing industry in Ireland uses large quantities of hot water to ensure plant and equipment are cleaned on a daily basis after each shift. Typically, triggered hoses are used to wash down contaminated surfaces with hot water at temperatures ranging from 55°C to 65°C. This incurs a cost to the business which (a) includes the cost of water which is typically €2.50/m³ and (b) the cost of heating this water which can result in hot water cost ranging from €5.00/m³ to €10.00/m³.

Summary of Project

A large meat processing plant in the Midlands, identified that 31% of water consumed was associated with the cleaning process. The plant also estimated that they were consuming 590 m³ of hot water per week for the cleaning operation. Where fuel costs 5 cent per kWh and water costs €2.50 per m³, this corresponds to a cost of €3,500 / week for water and energy.

The triggered hoses used in the cleaning operation were measured at 26 litres/min. By reducing average flows to 20 litres/min, it was estimated that the plant could save;

- Potential water savings: 7,000 m³ per year saving €17,500
- Potential fuel savings: 425,000 kWh per year saving €19,500
- Total Potential Annual cost savings : €42,000

TOP TIP– Heating water to say: 65°C from 15°C, costs €3.40 per m³, where fuel costs 5 cent kWh and boiler efficiency is 85%.

Slaney foods save over €28,000 on energy

SLANEY FOODS INTERNATIONAL – CO. WEXFORD



Financial Benefits:
 Cost Savings: €28,036 p.a.

Environmental Benefits:
 CO₂ reduced: 124 Tonnes p.a.

The Background

Located in Slaney Valley, one of Ireland’s prime farming regions, Slaney Foods is renowned globally for sourcing the highest quality livestock for its beef processing business. Slaney Foods combine this quality Irish beef with an ultra modern processing facility to offer a superb end product to the consumer.

At Slaney Foods energy reduction forms part of the company’s GreenTrack sustainable development corporate philosophy. As part of Slaney Foods’ commitment to sustainability, the decision was made to actively monitor and target the energy consumption in the Bunclody plant. After engaging with Green Business and Wattics, it was decided that Wattics energy management solution would be installed, with the aim of monitoring and targeting the usage in three key areas – Effluent Treatment, Livestock Processing and Refrigeration.

Project Description

The energy management solution was installed in the three key areas, and using 3G communications, are sending the energy data from the monitored areas to the dashboard. This solution dramatically improved visibility on energy use in the facility and enabled Slaney Foods to quickly identify energy costs for significant electricity consumers and to assess equipment operational energy patterns.

Slaney Foods have been very proactive in identifying energy saving opportunities at their Bunclody facility and have been very quick to implement any measures which have been proposed.

The Results

A number of measures have been implemented at the Bunclody plant, which has seen significant savings to date. These include;

Electricity Conservation Measure	Annual Savings
Installation of Variable Speed Drives	€4,754
Glycol Pump Discontinuation	€2,852
Submersible Aerator Removal	€10,582
Balance Tank Aeration Timer Change	€3,248
Energy Efficiency Drive	€5,030
Reduction in AHU Use	€1,570
Total Annual Savings	€28,036

Savings in consumption and cost correlates with our ISO 14001 accredited environmental management plan. - Robert Kirwan, Group Environmental Manager.



€6,000 savings a year and a cooler kitchen!

LA TRATTORIA – MIDELTON



Description of Business

This busy family run restaurant in the centre of Midleton, Co. Cork employs 23 staff and is open 7 days a week with staff on site from 6AM – 10PM.

Project Description

Like many Irish businesses, they have been working hard on reducing overheads and improving the efficiency of their restaurant in the past few years. They have looked at all aspects of the business and have made a number of key improvements including:

- Upgraded their lighting to more efficient LEDs
- Changed water fixtures and fittings to more efficient ones
- Improved recycling and now get suppliers to take back packaging materials
- Consolidated inefficient cooking machines

The Result

Through these actions they have reduced their overheads with the monthly spend on electricity down by 35%.

Heat Exchange

As with any restaurant, the kitchen in La Trattoria is a hotbed of activity all day long. With all the cooking it gets very hot and previously there was an extraction fan that was running all day to reduce this heat. At the same time, they were spending over €9,000 annually on oil heating for hot water and space heating in the restaurant.

In 2013, La Trattoria decided to use this heat from the kitchen in a constructive way. They installed a heat recovery unit which takes the hot extracted air from the kitchen and uses it to heat water. This system now supplements their oil boiler, which is now actually only used for space heating.

The total cost of installation, which included the extraction ducting, the heat exchanger and hot water tank was €6,000. Since 2013, thanks to this system their oil bill has been reduced to €3,000 indicating an annual saving of €6,000.

A one year payback on investment, a more pleasant working environment in the kitchen has proved to be a win win for La Trattoria and their staff.

Financial Benefits:

Cost Savings: €6,000 p.a.

Investment: €6,000

Payback: 12 Months

Environmental Benefits:

CO₂ reduced: 20 Tonnes p.a.



Island Seafoods Ltd. make giant steps towards sustainability

ISLAND SEAFOODS LTD. – KILLYBEGS



Description of the Business

Island Seafoods Ltd., was established in 1986. Located in the village of Killybegs, its products range from mackerel, herring and sprat to blue whiting. The business is certified by the Marine Stewardship Council, which recognises and rewards sustainable fishing and promotes the best environmental choice in seafood.

Background

Island Seafoods Ltd. has a history of improving efficiencies at their plant, and reducing their energy and water requirements. In 2007, Island Seafoods Ltd. commissioned a hydroelectric power plant that generates 700MW of electricity each year (~ 60% of the factory's annual consumption, 350 t carbon emissions offset yearly).

In 2009 with SEAI funding, 6 key improvements were made, and these have contributed to a reduction of 200 MWh per annum, and a reduction of 205 t of carbon emissions. The overall spend by Island Seafoods Ltd. was just €86k with SEAI grant assistance of €44k.

Recent Improvements

Recently Island Seafoods Ltd. has focused on managing electricity used for lighting and refrigeration. By installing an online monitoring and targeting system they have identified their key electrical loads and profiles. This has allowed the company to focus on the big energy users and reduce their consumption.





Financial Benefits:

Cost Savings: €32,000 p.a.
 Investment: €86,000
 Payback: 2.5 Years

Environmental Benefits:

CO₂ reduced – 137.5 Tonnes p.a.

The key improvement included:

- A water cooled condenser installed on the cold store – switching from an electrical powered refrigeration system Island Seafoods Ltd. availed of a natural resource to reduce their electrical demand. A cooling tower, which uses water from the same stream where they generate their hydro power, reduced electrical demand by 34.5 MWh annually.
- Maintaining product at –18°C or below is energy intensive and any loss of coldness through gaps or weak spots in the fabric of freezers or chill rooms is an ongoing cost that is difficult to quantify. Once the cold stores had been heat tested the ceiling edges and corners were further insulated to minimise losses and reduce the running times of the compressor. This resulted in an electricity reduction of over 20 MWh a year in the running of the refrigeration system!
- A soft start motor was fitted to the main blast freezer compressor to reduce the peak loads during start-up. While this resulted in a 5MWh saving annually, it also reduces the pressure on the mechanics of the refrigeration system.
- Flourescent lighting was replaced with LEDs. The use of natural daylight was maximised through strategically placed skylights when the factory was extended.
- In areas where occupancy is not constant sensors were fitted. This, in conjunction with the improved efficiency of the light fittings resulted in a 27.2MWh annual savings.

Goals for the Future

As part of its work towards a Sustainability Charter for Bord Bia's Origin Green Programme, Island Seafoods is currently working with Green Business to further reduce their environmental impacts.

Some of the key areas where Green Business is currently assisting Island Seafoods:

- Further reducing electrical demand in the blast freezers and chillers by switching from metal halide lights to LEDs.
- Reducing water use through improved cleaning practices.
- Designing a heat recovery system which will take waste heat from the current refrigeration system (cooling tower) and preheat water for use throughout the site (currently heated by immersion).

Island Seafoods aims to become electrically self sufficient, through reducing electrical demand as much as possible, and installing a wind turbine to make up the shortfall that currently exists between what the hydro plant generates and what the factory uses.

With this vision of sustainability now ingrained within the business, Island Seafoods is an example of how this important indigenous sector can progress towards a better and greener way of working.

Atlantis Case Study

ATLANTIS SEAFOOD – WEXFORD



Description of the Business

Atlantis Seafood produces a variety of products for the Irish market. An EPA CGPP project helped identify €4,000 in water savings per annum.

Project Description

The first step in the process was an on-site visit by the Clean Technology Centre. During this visit a number of leaks were identified around the site, including some hot water leaks. Atlantis were then set up with an on-line water meter. This attaches to the council meter and provides live meter readings, which allowed water use to be monitored remotely. This was then monitored over a few weeks and, with a bit of investigating, some serious savings were made.

The first weekly profile, before any of the various small leaks were repaired, is shown below in Figure 1. The council meter feeds a number of large holding tanks, so this meter cannot be used to give instantaneous readings relating to processing. Instead what it shows is that on Sundays (circled in red), when there was no processing on site, there was water constantly flowing.

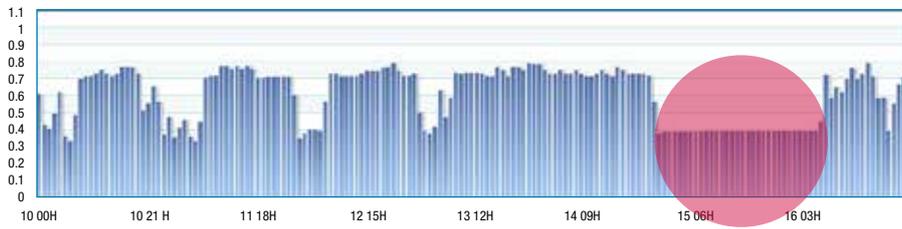
The Result

A number of the small leaks were detected and repaired, but on re-examining the profile the following week there was only a minor difference. That weekend, the site was checked on Sunday, and it was noticed that there was a sound of flowing water coming from the holding tanks. A ball-cock not running correctly was found, and this was running constantly with the water exiting through an overflow pipe that went straight to sewer. This was repaired and the next week's profile is shown in Figure 2.

There was still a small leak noted (green circle) and this was traced back to the ice making machine. A new part was ordered for this and the profile in Figure 3 shows the improvements made through leak detection and repair, during the course of this pilot programme. It is estimated that the savings made through this leak and detection process saved Atlantis Seafoods between €4,000 annually.

While this is a once off saving it indicates the potential savings that can be made through basic leak detection. For more information on doing this at your site go to http://ctc-cork.ie/BIM-Water-Tool/bim_use1.html

Figure.1 Consumption in m³ at 16/05/2011



Financial Benefits:
Cost Savings: €4,000 p.a.
Investment: €2,000
Payback: 6 Months

Environmental Benefits:
Water Reduced: 200 m³ p.a.

Figure.2 Consumption in m³ at 30/05/2011

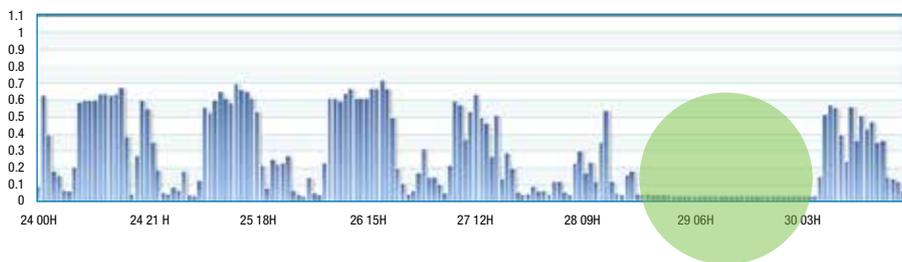
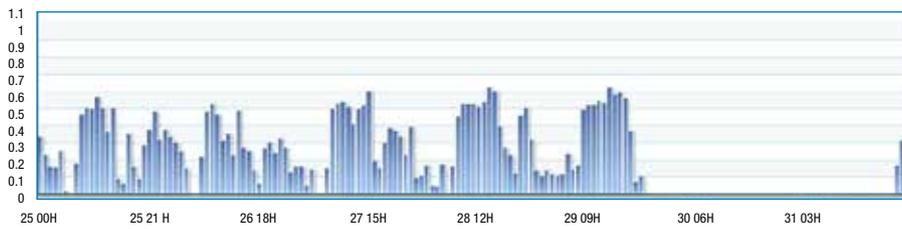


Figure.3 Consumption in m³ at 31/10/2011



Seafood producer reduces water use by 30% per annum



SOFRIMAR KILMORE QUAY – CO. WEXFORD



Description of the Business

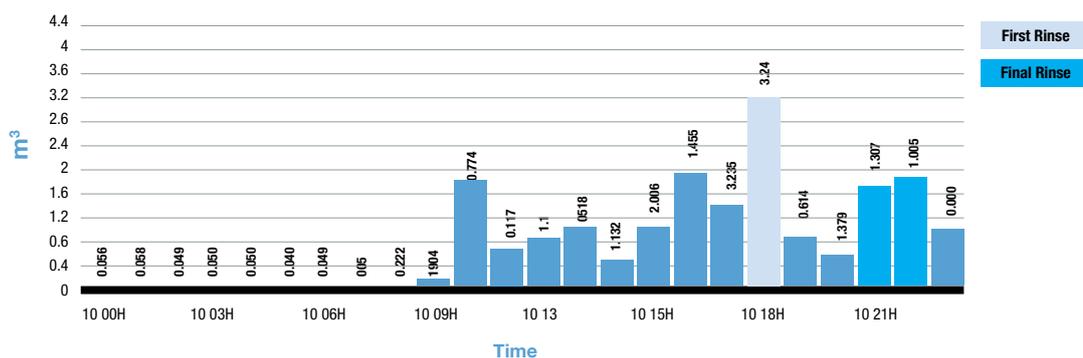
Sofrimar was established in 1979 to harness the abundant supply of shellfish and whitefish landed at Kilmore Quay. Located minutes from the harbour, Sofrimar works with the local fishing community to bring Ireland's premium seafood to markets throughout the world. With unique access to a diverse range of produce, some 80% of the business is in shellfish – whelk, scallops, crab, live lobster, langoustines, shrimp and winkles – with the balance in whitefish, including monkfish and sole.

Project Description

Seafood processing companies consume large quantities of water each year. Water, both hot and cold, is used for a variety of tasks including cooking, cooling, in processing machines and of course daily cleaning procedures. Cleaning in the seafood industry is an important daily task. In the past few years there have been significant improvements in this area that have resulted in reduced cleaning costs while maintaining the highest standards of cleaning. These improvements have seen reductions in the water, chemical and energy used for site wide cleaning at many Irish food businesses.

As part of BIM's Green Seafood programme, Sofrimar installed an online water monitoring system. This identified that large quantities of water were being used each evening for site cleaning, especially during the 1st rinse phase (highlighted below). On closer examination of the cleaning practices it was noted that high pressures and high water volumes were being used for cleaning. Flow rates through the open hoses used around the site were typically 100L/minute.

Figure 1 Water Consumption (m³) on 10/10/2011



The Results

After the initial site assessment was made, the flow rates and times for cleaning were measured for all areas in Sofrimar. From these an estimate for the water used for cleaning annually, and the associated costs, was made. This provided the information to do a detailed cost benefit for an upgraded centralised cleaning system. The new system, installed by EcoLab, had the following main benefits:

- Water flow rates were reduced from, on average 100L/min, to between 30 and 40L/min. This was achieved using a centralised system with high-pressure low volume hoses with specific cleaning nozzles. These made cleaning, especially for the first rinse step, much easier and quicker than using just high water volumes.
- Centralised chemical dosing for the foaming step which resulted in reduced chemical use.
- The improved water sprays from the nozzles reduced misting throughout the site, which improved the efficiency of the final rinse cleaning step.

Initially, due to uncertainty about the cleaning capability of lower flow rates 40L/min hoses were used. Since then, due to the positive feedback from cleaning staff, these flow rates have been reduced further to between 20 – 30L/min. The payback on the investment was about 13 months and has resulted in significant annual savings for Sofrimar on their water charges.

Financial Benefits:

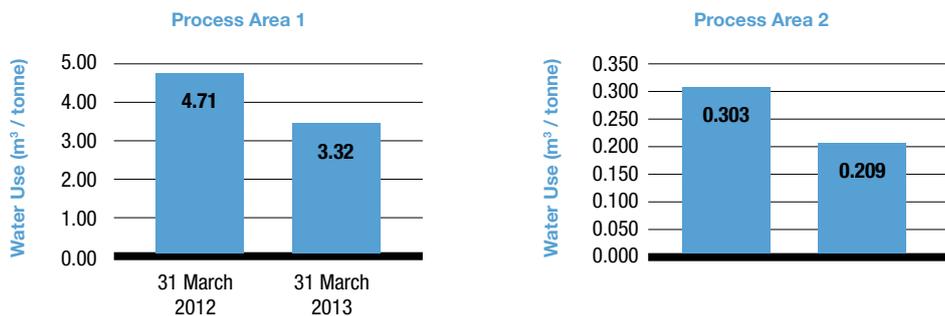
Cost Savings: €20,000 p.a.

Investment: €34,000

Payback: Under 2 Years

Environmental Benefits:

Water reduced: 30% reduction per tonne of product processed



In an effort to quantify the savings made relative to the level of the production, the volume of water used has been compared with production throughout. For the 2 main processes in Sofrimar the savings made have seen a 30% reduction in the volume of water used per tonne of product processed.

While some other changes have been made on site these savings have been mainly due to the new centralised cleaning system and improved cleaning techniques.

Water conservation programme saves over €50,000

DUN LAOGHAIRE SHOPPING CENTRE – DUBLIN

Dún Laoghaire
SHOPPING CENTRE



Project Background

In 2009, Management at Dun Laoghaire Shopping Centre decided to address their increasing water bills. Initially they addressed their own water usage in public toilets, where urinals were changed to waterless ones. However, in 2010, during a routine night inspection by Dun Laoghaire–Rathdown County Council, it was discovered that the Centre’s water meter was running continuously throughout the night. This led the Centre Management on a journey to discover the source of the problem, which involved trying to locate any readily identifiable leaks. Those identified were repaired and, while this reduced water use, it did not completely eliminate the problem. A more detailed night–time survey identified that, while all landlord areas within the Centre were now leak–free, the problem of wasted water was related to rented units in the Centre.

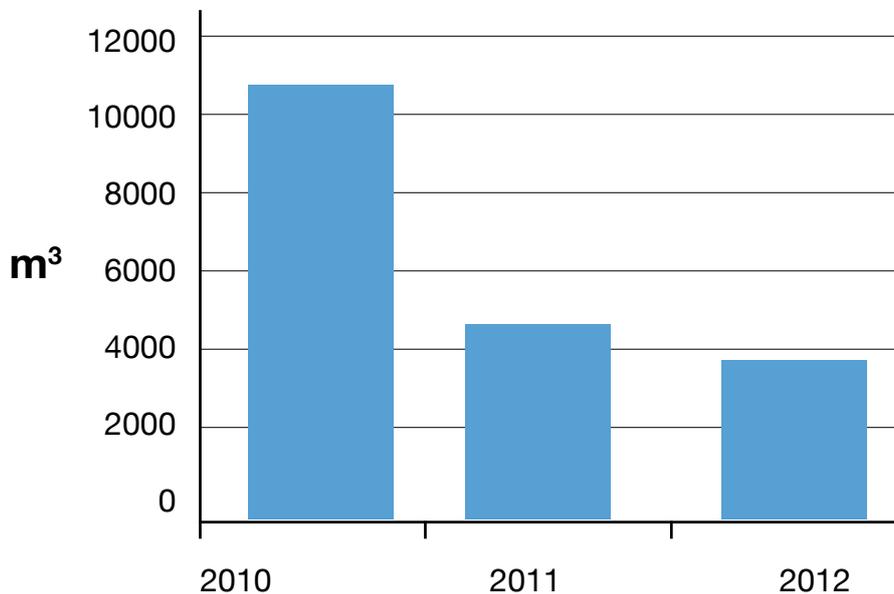
Summary of Project

Due to the lack of sub–metering for the individual units, it was not possible to identify exactly where the main waste of water was occurring. Management communicated, to all units, the need to ensure that all leaks were reported and asked them to turn off fittings daily at the close of business. While there was a decrease in background water consumption after this, there was still water being used each night.

Centre Management then asked each unit for permission to examine their water fixtures and fittings. Once permission was granted, all units were visited during normal trading hours and the sources of background water use were identified. Leaking urinals and water heaters were the main cause of background water use, and in one instance a ball cock was broken in a water tank within a tenant’s area. As none of these items were actually causing a flood, in most circumstances the tenants were not aware that water was being wasted.

TOP TIP – Checking if water is being consumed when there is no activity in your business (e.g. overnight) is a very important first step. If there is, then you may have leaks and this is water and your money down the drain.

Figure 1. Water Consumption January To March – 1st Quarter



Financial Benefits:
Cost Savings: €51,147 p.a.
Investment: €2,000
Payback: 2 Weeks

Environmental Benefits:
Water reduced: 63% p.a.

The Result

Water consumption figures, for the first quarter of each of the past 3 years, are shown in Figure 1. Water used during the first quarter of 2011 was down by 54% compared with the same period in 2010 and this was related to the repair of the major leaks identified in the various units. While the decrease between the first quarter of 2011 and the same period of 2012 was only 12%, this is still a significant improvement as it has been related to better awareness of water use and further identification of smaller leaks which are more difficult to detect.

Since the improvement programme started, the Centre initiated a continual cycle of water reduction measures. An on-line Izar unit was fitted to the Council supply meter in 2010. This gives continual data on water use so that any sudden increase in use, which would indicate a leak, can be tracked. The water reduction programme run by Dun Laoghaire Shopping Centre has proven to be very educational for both the Centre Management and tenants alike. They have succeeded in:

- Eliminating leaks throughout the Centre and reducing to almost zero the background “use” of water
- The installation of an on-line continuous water monitoring system which allows instant leak identification
- Reduction in the service charge for tenants due to the reduced water costs for the Centre
- Promotion of Dun Laoghaire Shopping Centre’s Green Image

The Centre’s water improvement has been an ongoing journey that started 4 years ago. All the hard work done initially, investigating leaks and getting our night water use down to zero, has resulted in a system where we can monitor this to help prevent future water wastage going on without our knowledge.

– Adele Ryan, Centre Manager.

Water conservation programme saves over €24,000

STILLORGAN VILLAGE – DUBLIN



Description of Property

Stillorgan Village is a shopping centre located in South County Dublin. The Centre has over fifty retail outlets including a supermarket, restaurants, food hall, fashion retailers and services providers and trades seven days a week.

Summary of Project

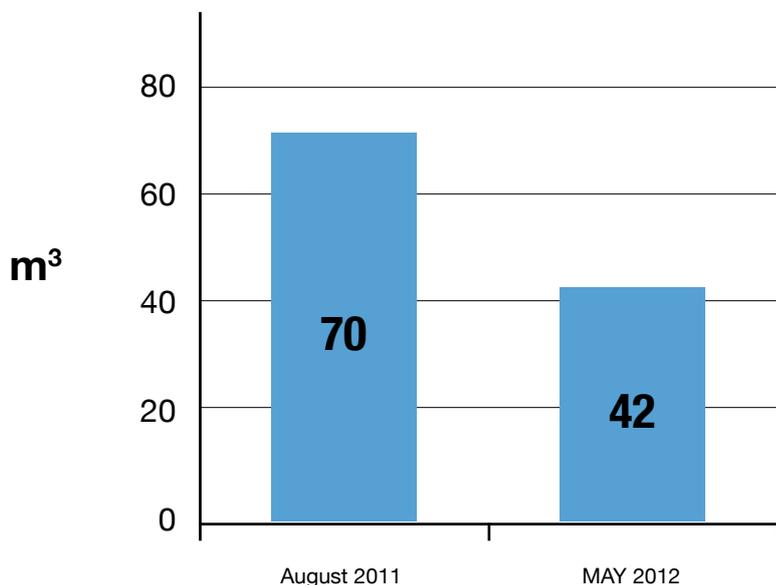
The Centre decided to adopt an Environmental Programme in early 2011 as a means of improving its environmental performance and reducing operating costs. An Improvement Plan was developed for a range of energy, water and waste reduction actions.

The Shopping Centre has a bulk water meter for the water supply to the whole site and sub-meters in the individual retail outlets. Stillorgan Village analysed their water bills and identified a significant amount of unexplained water use by subtracting the aggregated sub-meter readings from the bulk meter readings.

Stillorgan Village began monitoring water use by taking overnight meter readings when the Centre was closed. This enabled the logging of the main bulk meter readings and provided flow analysis reports. These readings showed significant water flow outside normal trading hours and confirmed their suspicions that they had one or more water leaks. Leaks were located at various locations around the site and two further leaks within the premises of retail outlets. These were repaired and a number of fittings were replaced as a preventative maintenance exercise.

All sub-meters in the Centre were reviewed to ensure that every sub-meter was identified correctly and accounted for in terms of its location in specific units. Cisterns were adjusted on all toilets to optimise their performance equipment and fittings checked in public and staff toilet areas.

Figure 1. Daily Water Use (cubic meters)



Financial Benefits:
Cost Savings: €24,000 p.a.
Investment: €15,000
Payback: 7 Months

Environmental Benefits:
Water reduced: 10,200m³ p.a.

The Result

Before Stillorgan Village began the project, the Centre was using 70m³ of water per day of which 53m³ per day was un-accounted usage. The leak repairs, upgrades to the water infrastructure and water saving measures have combined to reduce our usage to 42m³ per day – an impressive 40% reduction.

The total cost of the improvement works, including surveys, was €15,000. The net saving to the Management Company and tenants was €24,000 in year one which is equivalent to a 7-month payback time. Stillorgan Village is now using 10,200 m³ less water each year. They also monitor water usage closely so that any future leaks, which may occur, will be quickly identified and repaired.

We are delighted to have identified and corrected hidden problems which were happening under our feet every day. Only when you measure your performance can you really start to get control.

– Ray Coary, Centre Manager, Stillorgan Village.

Comparing best practices in the dairy industry for CIP of milk evaporators to identify savings

IRELAND'S DAIRY INDUSTRY



Description of the Business

Ireland is the 10th largest dairy exporter in the world and produces 10% of the global exports of infant milk formula. Therefore, a number of dairy processing sites have milk evaporators, followed by dryers to produce this milk powder.

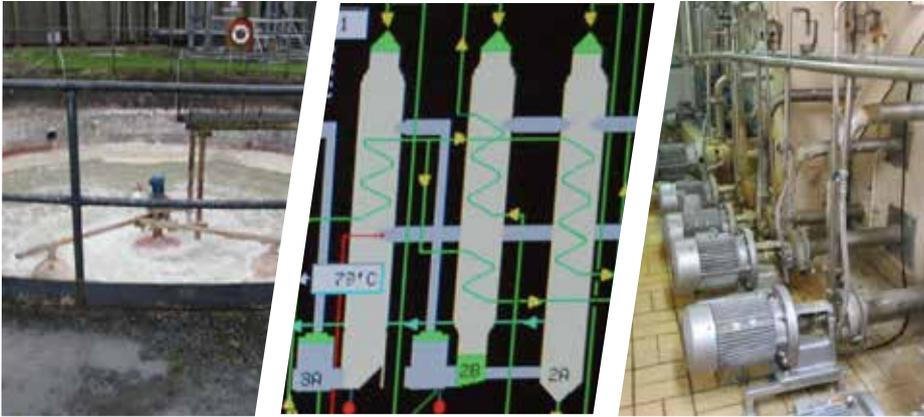
Project Description

Cleaning in place (CIP) of milk evaporators is typically carried out daily, accounting for a significant usage of heat, chemicals and water, while dryers would only require cleaning on a more infrequent basis. Through the Irish Dairy Industries Association (IDIA), the detailed CIP practices for evaporators across 6 different sites was established and compared to identify differences and to see if improvements made by individual sites could be transferred across all sites.

Findings identified:

1. Overall, there is plenty of commonality for CIP of evaporators, but also quite a range of differing practices across the companies, with some new innovations being introduced.
2. There are good practices underway at some companies, which may be transferable to the rest, that would result in savings in water and/or energy, increased product recovery, reduced effluent loading, or savings in time.
3. Total potential savings per annum across the companies have been identified to be of the order of €90,000 – €130,000, as well as potential production hours increases of 26 to 51 days, if the practices being carried out by some companies were to be adopted by all. This breaks down as follows:

Potential annual savings identified	ACROSS ALL 6 COMPANIES	
	Lower estimate	Upper estimate
Production hour savings	26 days (622 hrs)	51 days (1,222 hrs)
Financial savings in energy, chemicals & water	€90,000	€130,000
Energy savings	400,000 kWh	972,000 kWh
Concentrated cleaning chemical savings	224,000 litres	262,000 litres
Water savings	56,000 m ³	63,000 m ³
BOD to effluent savings	101,000 KG	
Product solids recovered	79 TONNES	



Financial Benefits:

Potential Cost Savings: €130,000 p.a.

Environmental Benefits:

Reduced BOD Loading: 100 Tonnes p.a.

CO₂ reduced: 350 Tonnes p.a.

Potentially transferable practices.

While there is a range of product types as well as varying evaporator sizes and age, the potentially transferable practices cover most of the ranges involved. Potentially transferable practices include:

- a. Longer production runs – one site has 30 hours between cleaning. The average for the other companies is 17 hours between cleaning, and for the larger high through-put plants is typically every 20 hours. Longer runs will reduce CIP material and energy use and maximise production hours.
- b. The use of evaporator condensate in CIP instead of fresh water for rinses, including the final rinse. This is being carried out in some of the companies across a broad range of product types, equipment sizes and evaporator ages.
- c. The recovery of product from the evaporator prior to CIP, or at the very start of CIP during the first rinse. This is being carried out in some of the companies. This increases the amount of product, while reducing the BOD loading to effluent plant.
- d. Reuse of caustic and acid solutions. Some, but not all, of the companies are retaining caustic and acid and reusing the bulk of it.
- e. Potential for reduction in acid and caustic wash temperatures in some companies and a potential to substitute elevated temperatures in some rinsewaters by ambient temperatures.
- f. Aside from the use of conductivity in control of chemical solutions, some of the companies use conductivity for control of rinse waters during cleaning.
- g. Certain management practices which could be implemented in some companies, including quantification of amounts of water used for rinses.

ABP Food Group make "Zero Waste to Landfill" possible & reduce carbon footprint

ABP FOOD GROUP – TIPPERARY



Description of the Business

ABP Beef, a subsidiary of ABP Food Group, is one of Europe's leading beef exporters specialising in beef processing, de-boning and retail packing. The company processes more than one million cattle annually at 20 sites throughout Ireland, the UK and Poland, with an aim to be Europe's leading supplier of premium grass-fed beef. ABP has six sites in Ireland. ABP developed a sustainability policy whereby the company is committed to "Doing More With Less". Through its forward thinking approach to waste management, water conservation, energy reduction and continuous improvement, the company strives to decouple increased resource consumption from increased production.

Project Description

In 2011 ABP set a waste reduction target of zero waste to landfill by 2015 in line with the Origin Green programme. It was hoped that this initiative would lead to CO₂ emission reductions, cost reductions, optimised resource usage and ultimately waste prevention. From an early stage it was decided to focus on waste segregation to increase recycling rates at all sites.

Actions Taken:

- A waste hierarchy was implemented at each site which was critical to the zero waste to landfill plan.
- Almost all waste was previously sent to landfill, therefore ABP used LEAN techniques to identify key waste outputs. The company also developed a strategic approach to ordering materials, increased recycling and forged partnerships with key energy recovery partners.
- Prevention measures, coupled with internal communication, were used to help all employees to see waste in the business as an important resource.
- Cardboard was significantly reduced at all sites with the introduction of the re-usable plastic tray system. This initiative was expanded by also replacing cardboard boxes for customers with reusable plastic trays; thereby significantly reducing the amount of waste that the company placed on the market.
- A "working on waste" programme was introduced to inform employees about reducing food waste. ABP now advise all employees to better manage food, from purchase, storage, cooking, consumption and disposal both at work and at home.
- By implementing a new colour coded bin campaign (i.e. food waste only, cans only, all other waste) the company was better able to manage waste leaving each site.
- Waste segregation in the process areas allowed each site to significantly increase recycling rates by separating contaminated and uncontaminated plastic.
- Establishing new partnerships with key energy recovery companies was instrumental in developing alternative disposal routes for municipal waste. This was the last step in achieving zero waste to landfill.

Waste/Recycling Breakdown Cahir Site 2008 – December 2015



Financial Benefits: Cahir Site Only

Potential Cost Savings: €10,000 p.a.
Investment: €0

Environmental Benefits:

Waste Reduced: 330 Tonnes p.a.
CO₂ reduced: 9 Tonnes p.a.

Results

The implementation of a waste hierarchy system was a huge success. This helped the company to optimise the amount of packaging brought onto each site and also helped the company to focus on appropriate disposal routes for all waste. LEAN techniques and internal communication strategies were key to engaging with all employees. Staff awareness was critical in achieving zero waste to landfill.

Cardboard was significantly reduced at all sites with the introduction of the re-usable plastic tray system. This initiative was expanded by also replacing cardboard boxes for customers with reusable plastic trays; thereby significantly reducing the amount of waste that the company placed on the market. New business partnerships were developed with energy recovery companies, aluminium can recycling companies and plastic recycling companies. This created a system where specific material was sent to these companies, thereby reducing ABP's carbon footprint while increasing the company's cost savings.

The original target was to achieve "Zero Waste to Landfill" by 2015. ABP reached this target in the beginning of 2014 which helped the Group obtain re-certification for the Carbon Trust waste standard.

Achievements for "Zero Waste to Landfill" at Cahir site

- In 2011 waste to landfill at ABP Cahir was over 300 tonnes with the zero to landfill target realised by January of 2014.
- In that time a significant expansion was developed at the site, in particular in the meat packing facility.
- Switching to re-usable plastic trays helped reduce cardboard waste.
- The site aims to recycle 1 ton of aluminium cans in 2015 (1 ton = 79,000 cans approx.) which will counteract the emission of 9 tonnes of CO₂ from processing virgin material.
- In 2014 the site recycled over 560 tonnes of material while waste sent for energy recovery was over 330 tonnes.

"One person's packaging is another person's waste, we needed to reduce the amount of packaging to our site in order to reduce our waste offsite thus improving our carbon footprint in the process"

– John Durkan, Group Environmental and Sustainability Manager, ABP food Group.

ABP Food Group is doing more with less and saving on water bills!

ABP FOOD GROUP – TIPPERARY



Description of the Business

Meat processing facilities use water in almost all of their operations. At ABP Cahir, part of ABP Food Group, the site uses 45, 65 and 90°C water for a range of processes ranging from sterilisation to wash-down. This in turn leads to high energy use to heat the water. The site also uses large quantities of cold water throughout the facility. ABP is committed to reducing its water consumption and promoting water management. ABP Cahir are currently the only facility in Ireland aiming for European Water Stewardship Certification.

Project Description

In 2008 ABP launched its “doing more with less” Campaign aimed at different sustainability aspects throughout the company with water as a key focus area for possible reductions. Having already reached a corporate target of 10% in water reduction, ABP Cahir decided to launch an intensive water efficiency project in 2014.

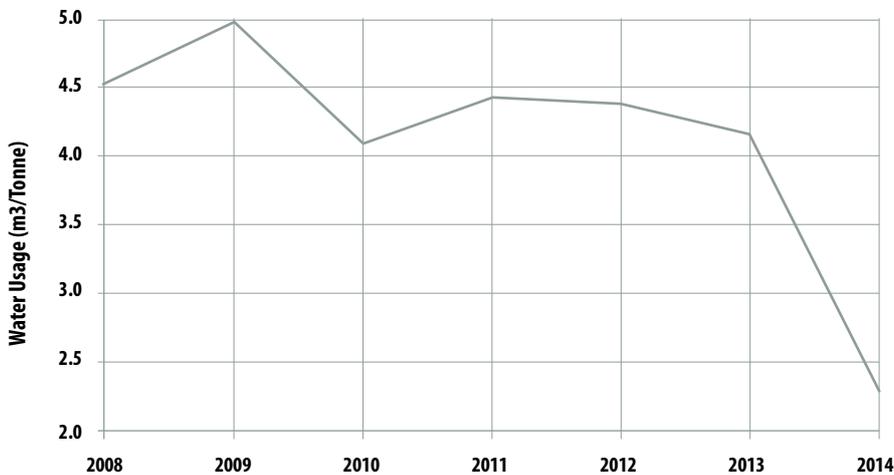
A data monitoring system was installed to deliver real time water flow readings. This allowed the team to produce accurate data on water usage throughout the site. By reducing hot water consumption the site was also able to reduce natural gas consumption, which in turn reduces ABP’s Carbon Footprint. Similarly, reduced water usage directly correlates to reduced electricity consumption to pump, treat and dispose of water.

ABP Cahir is committed to reducing its overall resource consumption throughout the site and water reductions are a priority.

Actions taken:

- Good housekeeping practices gave the site initial water reductions.
- LEAN manufacturing principles were integrated into the new projects to provide solutions to counteract significant water users.
- Accurate information on the “true cost” of water was established. Therefore, capital investment programmes in water reduction initiatives and/or technologies were based on accurate information.
- Staff culture changes have been implemented with a greater respect for water saving throughout the facility.
- Effective communication with staff via screens and information boards to show progress and help understand initiatives have also been critical in driving the reductions and instilling a sense of ownership.
- The extensive sub-metering will lead to continuous improvement with tighter targets and benchmarking.

Water reductions per tonne of product (2008 – 2014)



Financial Benefits:

Potential Cost Savings: : €150,000 p.a.

Investment: €50,000

Payback: 4 months

Environmental Benefits:

Water Reduced: 70,000 m³ p.a.

Results

These practices are currently being rolled out to all Irish sites. The systematic approach to water uses reduction and problem solving are being shared with colleagues through the LEAN programme. Management are keen to replicate the significant reductions at all ABP Ireland sites.

Excellent communication and data presentation with all stakeholders was achieved by presenting water use reduction graphically throughout the site. Feedback was also supplied through ABP's website and the company's internal social media. A Sankey diagram was also developed to help staff understand water consumption throughout the site.

Top level buy-in was a fundamental part of driving the initiatives. One of the key elements to reducing water anywhere on the site was to break down the problem. Therefore LEAN was an important tool. Measurement and verification was also key.

ABP Ireland is a member of the EPA funded "Community of practice in water management" which is a multi-industry steering group. ABP Cahir has hosted one of the recent roundtable meetings. This group provides a platform for discussions and offers solutions to water management issues.

The water and fossil fuel reductions at ABP Cahir have been independently verified by SGS, on behalf of Origin Green, as part of ABP Ireland's sustainability charter. ABP Food Group was re-certified to the Carbon Trust Water Standard, which included a site visit to ABP Cahir where an independent investigation was carried out.

Achievements of the water reduction initiative

- Since 2008 the site has estimated savings of over €300,000 through water reduction.
- A relative reduction (m³/tonne) in water usage of 45% was achieved. Therefore 45% less water was abstracted and 45% less water was treated in the WWTP.
- Similarly, a relative reduction (kWh/tonne) in electricity consumption in the WWTP of 13% was achieved.
- Therefore increased retention time within the WWTP was possible which improved the plant's performance and hence decreased the risk of emissions to the environment.
- A relative reduction (kWh/tonne) in natural gas consumption of 35% was also achieved.

Shop saves €13,000 a Year through Heat Exchange

CENTRA – WATERGRASSHILL – CO. CORK



Description of the Business

Watergrasshill is a busy town on the outskirts of Cork City on the main Dublin road. Ross's Centra shop on the main street is open all day and employs 14 people. During 2014 Ken Ross, the owner, decided to tackle his mounting overhead costs with a particular focus on electricity, which was the largest utility bill by far. With the help of the Musgrave Group, a retrofit and upgrade plan for the shop was developed.

Project Description

The main areas that they addressed were:

- Upgraded their lighting to more efficient LEDs throughout the shop. This included all refrigeration lighting, internal shop lighting and external security lighting. In areas of low occupancy sensors were also fitted.
- Upgraded the EC fans on all the display fridges to improve efficiency and reduce heat output.
- Replaced the individual refrigeration compressor packs from the main plant room with an external digital based compressor. This controls all the display fridges with individual temperature probes and ramps up and down as needed (as opposed to running all the time).
- As a consequence of changing the refrigeration system the 14 kW extractor fan on the plant room, which was running 24/7, has now been decommissioned.

Heat Exchange

Ross's Centra provides cooked products and hot food in its kitchen and Deli counter and, with the ovens and hot plates, this area gets very hot. An extractor fan was running constantly to keep the area cool. At the same time, they were spending an estimated €3,500 a year to provide hot water through the existing dual immersion system.

This was a key area that they looked at during the shop upgrade in 2014 and decided to use this heat to their advantage. Using the existing extractor system, a heat recovery unit was installed which takes the hot extracted air from the kitchen and uses it to heat water. This system has completely replaced the immersion system and is estimated to be costing ~ €350 a year to run. That's an annual saving of over €3,000. The investment cost for this system was ~ €6,000 which indicates a payback of 2 years.



Financial Benefits:
Potential Cost Savings: €13,000 p.a.
Investment: €45,000
Payback: 3 Years

Environmental Benefits:
Energy saved: XX p.a.
CO₂ reduced: XX p.a.

Results

In total the cost of retrofit work, including grant aid received, was ~ €45,000. It is estimated that they are currently saving at least €1,100 a month (€13,000 annually) which means that the payback on the complete shop upgrade is just over 3 years.

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**NATIONAL WASTE
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