

Green Seafood Case Study: Atlantic Dawn Group, Killybegs



18%

Seafood Processor
Reduces Energy
Consumption by >18%
through participating
in the piSCES project



Working with BIM and the piSCES team has led to invaluable insights into the savings that can be achieved with our thermal loads. As well as the efficiencies it has delivered it aligns with our sustainability objectives.

Company Description

Atlantic Dawn Group was founded in 1968 by Kevin Mc Hugh. Today it is one of Europe's largest producers of frozen pelagic fish. The company has a large operation encompassing catching vessels, sea freezing vessels and shore freezing factories in Killybegs Co. Donegal. Atlantic Dawn Group are committed to sustainable fishing practices. They work closely with the Marine Stewardship Council (MSC) to sustainably source their fish and are members of Origin Green.

Project Background (piSCES)

Atlantic Dawn Group took part in the piSCES project - an EU funded Interreg Ireland-Wales project focused on reducing energy use and costs for the seafood processing industry using Smart Cluster Energy Systems. Integrating renewable energies will form a major tenant of future smart grid's. As renewable energies are variable and intermittent in their nature, it is critical to be able to predict their output using modelling techniques. This information can be collated and modelled based on weather forecasting and environmental conditions locally. Flexibility in an industrial sites load profile is key to the success of these systems and with sufficient, accurate models, this load can be ramped up or down to suit on-site energy generation. The cost of electricity on the wholesale market also varies on a half hourly basis. Optimisation algorithms can then be employed to leverage this load flexibility to ensure energy is used at the most economic cost and maximising on-site renewables.

Improvement Programme

Understanding energy use profile: Atlantic Dawn Group worked with the piSCES project to establish their energy profile and determine which of their processes had a degree of flexible load. Through analysis of their energy bills the project found that there were patterns in the companies daily and seasonal energy use.

Flexible load: Ice making and cold stores were identified as processes with flexible load and suitable for integration with the piSCES system (i.e. processes could be ramped up or down at different times throughout the day/night).



Our shore freezing facilities are strategically located in close proximity to the fishing grounds.

Specific requirements: While both operations were flexible, they had specific requirements. Ice had to be available for daily fish landings. Cold stores had to maintain a temperature range of -18°C to -25°C. Analysis of the company's needs was carried out and trials were conducted to understand how piSCES could meet these requirements.

Energy generation: The piSCES system has been designed to integrate on-site generation of energy (through the installation of solar panels or wind turbines) into its modelling software. Companies using the piSCES system model the availability of solar and wind energy to further reduce costs and improve sustainability.

Market tariffs: Energy prices fluctuate on a half hourly basis however and can be traded on the 'day ahead' market where prices are set and energy can be bought at rates known a day in advance of use. Feeding this information into the piSCES system allows flexible load to be ramped up when prices were low and ramped down when prices were high.

Integrating into the piSCES system: All the data gathered from trials and testing were brought together to produce predictive models. Using this information, the piSCES system can predict the daily energy demand of the company, and the half hourly costs based on the 'day ahead' market. Using these three elements, an algorithm was developed by the piSCES team so that the most economic programme for daily energy supply could be automatically selected.

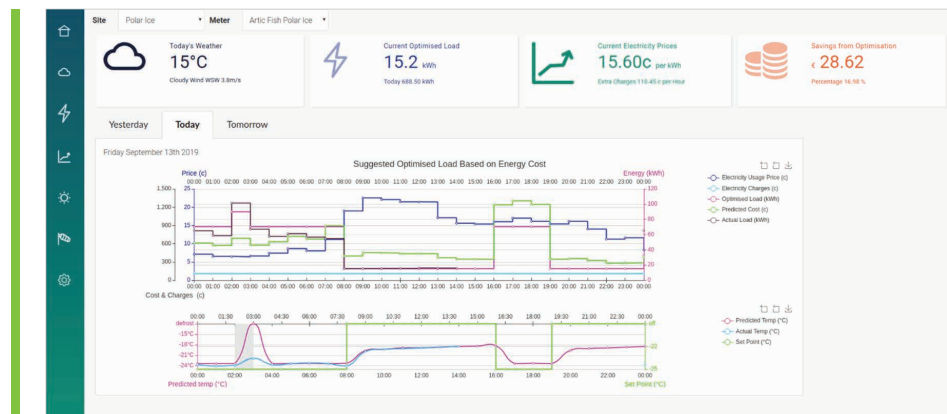


Figure 1: showing the piSCES dashboard system with hourly energy use, market costs and daily costs savings.

Key Benefits

Cost savings: ~18% energy cost savings were made through the implementation of the piSCES programme and best practice actions identified over the course of the project. This includes improvements in the operation of the cold stores such as defrost optimisation, lighting, room access and product stacking.



The onboard freezing system ensures the shortest possible time between catching and freezing the fish.

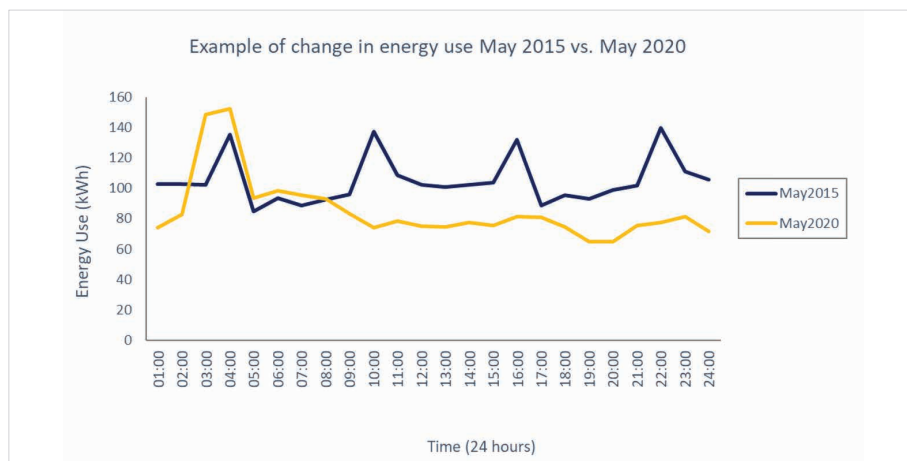


Figure 2: Line graph comparing energy use in May 2015 (blue line) and May 2020 (yellow line) to show the change in the pattern of energy use and the reduction in energy used by Atlantic Dawn Group.

Reduced impact: The use of novel technologies and the optimisation of cold stores and ice making reduce energy costs, energy use, GHG emissions and impacts on the environment helping the company to meet their sustainability goals and corporate social responsibility aspirations.

Future proofing: piSCES can cater for expansion plans for on-site generation of solar energy.

Automation: Through the automation of the ice making processes 'orders' for ice can be placed in advance (e.g., 10 tons of ice for 8am the next morning) and piSCES can determine the cheapest time of day/night to make the ice.

Time saving: Before piSCES the ice machines were manually operated. Automation of this process can substantially free up the staff time for other important tasks on site.

Reducing energy use: Implementation of best practice within the cold stores involved (i) installation of roller doors to maintain the thermal envelope and (ii) optimal product stacking to improve air flow. This reduced temperature fluctuations and the build-up of ice on the evaporator fans. As a result, defrost cycles were required less frequently and the overall consumption and cost of energy was reduced.

Automatic alerts: piSCES system monitors and automatically alerts staff when set temperatures are breached allowing for a quicker response to any process issues.

Increase knowledge: Staff have a greater understanding of electricity markets and tariffs and have gained confidence to negotiate electricity contracts with suppliers.

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