

ESP Case Study

NZ's Leading Cool Stores
and Food Manufacturers
Use ESP's Energy Data
to Cut Costs

Overview

In today's operating environment cool store and food processing businesses are constantly looking for ways to reduce costs and improve productivity. Energy is typically one of the biggest costs. That's why ESP has devised a robust, proven solution to track, manage and reduce energy use.

Results have varied from solid to spectacular. In every case savings in excess of 10% pa have been identified and in several cases achieved already. In most cases these savings have generated paybacks of less than 1 year on the initial investment made.

Method

"Data makes the invisible visible, and replaces assumptions with facts"

ESP's team of specialist engineers are able to design, specify and install remote monitoring solutions to measure electricity, gas, water and temperature data across complex sites. The collected data is then consolidated into a more complete data set through correlation of production data (i.e. trays of fruit, kgs of product, hours of operation, temperature setpoints etc.) allowing ESP to add context and meaning.

The information is tested, validated and analysed by ESP's team of technical experts. Our team has specific experience in refrigeration and controls, which is applied to the data in developing practical solutions.

"Without good data we don't know what we don't know"

Allan Dawson (MD) Aongatete Coolstores

11.5%⁺
savings identified
payback in less
than one year.

Background

In all cases our clients had little or no insight into how their sites were performing from an energy perspective. Therefore they partnered with ESP to better understand, track and reduce their energy use.

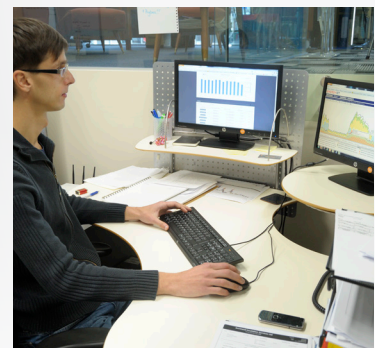
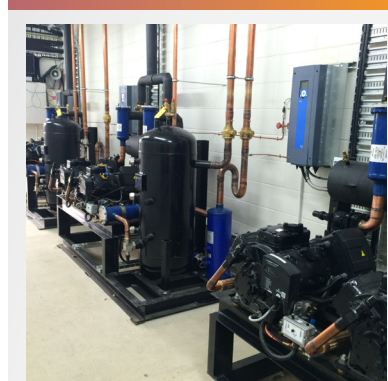
ESP now collects and monitors 289 million kWh per annum or \$21 million pa of energy within cool stores and manufacturing/cool store facilities. This is across 24 sites nationwide and represents 43% by consumption of ESP's portfolio of monitored sites.

Through ESP's programme 5.5 million kWh pa or \$634k pa of savings have been identified so far across 10 major cool store and food processing sites. The savings amount will increase as site reviews for 14 new customers are completed.

Data Analysis and Monitoring

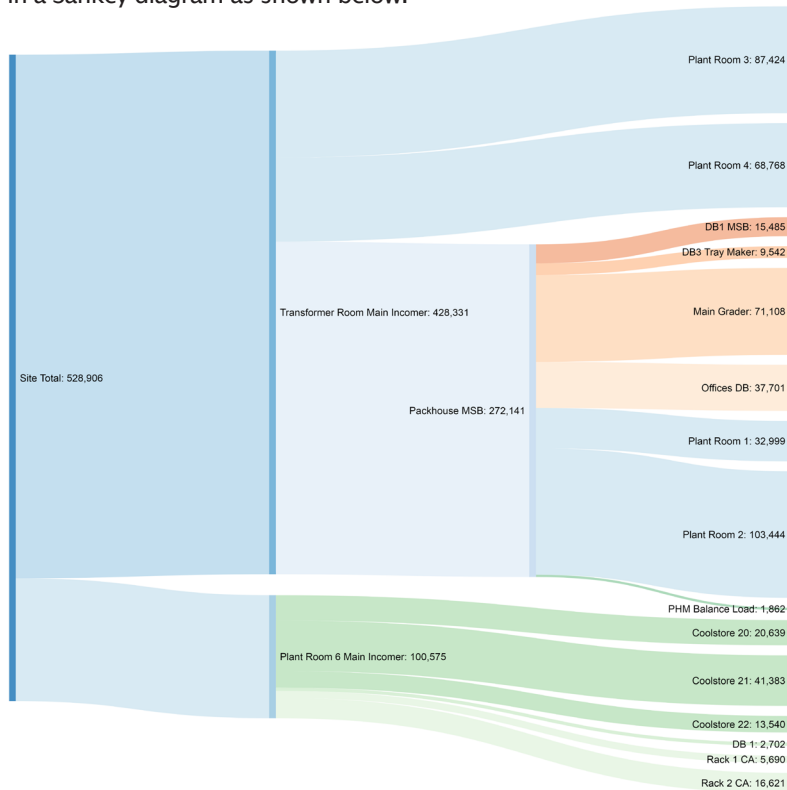
Across all these sites ESP has installed electricity and, where required, gas and water metering focussing on the major plant and equipment items. The resulting data gives our clients the ability to identify usage anomalies, variations and adverse trends. ESP has developed several reports and dashboards to track our client's energy consumption, including correlating energy use with stored product/throughput, temperature and compressor/capacity utilisation.

Following is an example of one such dashboard for an actual client.



Energy Use Breakdown

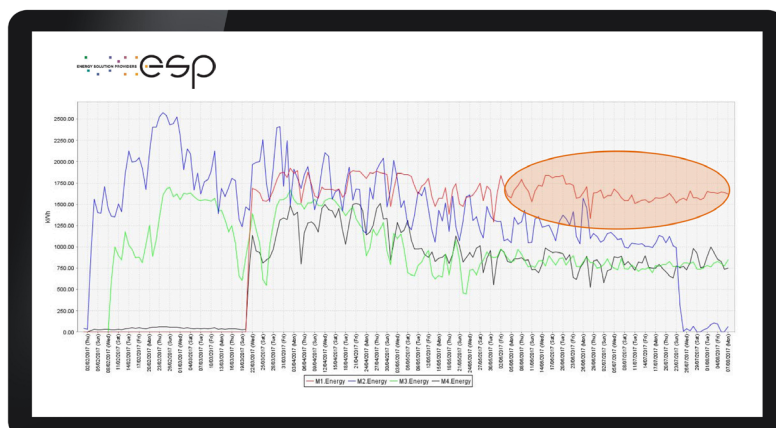
One of the first tasks ESP's analysts perform is to break down the relative volumes of energy used in each metered process or area. This is depicted in a Sankey diagram as shown below.



Sankey diagrams are a specific type of flow diagram, in which the width of the arrows is shown proportionally to the flow quantity.

By tracking this data by group/site/individual plant/equipment we are able to pinpoint where energy waste is occurring, and apply technical expertise to determine the corrective actions.

The following is the daily consumption of 4 adjacent fruit cool stores through the precooling and static cooling periods of the season. ESP's metering reveals cool store one's energy use is not tapering as expected and therefore creating waste energy. This difference is costing the client \$14,355 pa.



\$14,355_{pa}

Careful analysis of individual cool store energy usage quickly revealed opportunities to make significant cost savings.

Specific Savings Opportunities

From ESP's experience, some of the ways in which energy savings can be found and achieved in cool store and refrigeration operations include:

- Revealing the relative efficiencies of cool stores so product flows can be optimised
- Reducing heat gains
- Eliminating usage from specific stores/plant when they aren't operating
- Optimising compressor and/or cool store operating modes and controls
- Testing and trialling existing and new equipment at different settings, assessing compressor utilisation and monitoring VSD performance
- Early detection of any equipment malfunctions and/or R&M needs
- Optimising suction and/or discharge pressures
- Optimising control set points and plant commissioning
- Improving lighting controls and provide LED upgrade payback calculations
- Prioritising the best opportunities for plant upgrade in accordance with the client's requirements



Results

"We have been working with ESPNZ for just over 12 months and have made electricity savings well in excess of our initial expectations – the M&T project proves the adage that you can't manage what you don't measure. The ability to measure detailed machine and operation specific electricity usage has been the catalyst to saving in excess of 1.1 million kWh in the last 12 months.

The success of this project is down to three key factors. The measurement and analysis provided by ESPNZ, the employment of a dedicated resource internally to drive the project, (and) Senior Management commitment to the project."

Bruce Fyfe Group General Manager – Commercial, Wilson Hellaby Ltd.

**1.1
GWh**
Saved in the
last 12 months

About

Energy Solution Providers (ESP) is recognised as New Zealand's leading energy management company; 2016 Winner of the EECA NZME Business Service Excellence Award, finalists in two sections of the 2016 AUT Business Support Awards and finalists in the 2015 Sustainable Business Network award for Mega Efficiency.

Our unique strength is unlocking the value of utility data. We supply and install high quality utility metering equipment, including electricity, gas and water meters, and correlate the data with other key metrics. ESP offers an end to end solution from measurement to full service utility management.

ESP currently works with 70+ organisations, 8000 + data points across 3400+ meters, and over 550 sites in which we have designed and are delivering their energy management programmes. As a result of these programmes we have helped our clients achieve in excess of 127 million kWh in savings and more than \$23 million dollars in cumulative savings.

To find out how ESP can help your business please contact us at

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