

SWIRO

Services and Waste Insights, Reduction and Optimisation

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Project Description

The "Services and Waste Insights Reduction and Optimisation" (SWIRO) project, commissioned by AMPC, was designed to improve the environmental performance of the red meat processing industry. The project focused on identifying and optimising resource usage, particularly water, electricity, and natural gas, by installing digital meters and leveraging data analytics for operational improvements. Dardanup Butchering Company (DBC), an Australian meat processor, was selected as a pilot site. The goal was to use advanced metering to pinpoint inefficiencies, reduce waste, and implement sustainable practices that could be shared across the industry.

Project Content

At the core of the SWIRO project was the installation of digital meters to monitor and report real-time data on utility usage throughout the DBC facility. Initial efforts focused on metering water usage, particularly for hot and steriliser lines, which were found to be significant contributors to waste. Over time, the project expanded to include electricity and gas metering across eight key areas within the plant.

A variety of technological solutions were deployed, including Siemens magnetic flow meters, Schneider power tags, and RedLion Flex Edge controllers. These devices fed data into a central SQL server, enabling analysis through Microsoft PowerBI. This system allowed for detailed tracking and reporting of utility usage. The project also included predictive maintenance strategies, procedural adjustments (e.g., changing boiler start times), and the implementation of timers to manage water flow in areas like the wastewater rotating screens, which reduced water consumption significantly.

Project Outcome

The project delivered measurable improvements across several key metrics:

Water Usage: Water consumption decreased from 5.45 L/kg of Hot Standard Carcass Weight (HSCW) to less than 3.0 L/kg HSCW, resulting in over 25 ML of annual water savings.

Electricity & Gas: Electricity consumption saw modest improvements, but the real gains were made in natural gas usage, which dropped by 18%. These reductions were primarily driven by operational changes like reducing the start times of boilers and sterilisers.

Cost Savings: The improved tracking and control of resources translated into lower utility costs, making the plant more efficient and cost-effective.

Real-time Monitoring: The ability to monitor utility usage in real-time led to quick identification of leaks and inefficiencies. For example, water leaks in steriliser lines were detected and promptly addressed, preventing further wastage.

Predictive Maintenance: The use of data to predict equipment maintenance needs helped avoid unplanned downtime and further optimised resource use.

Overall, the project not only met but exceeded its objectives, and it provided DBC with a solid foundation for ongoing sustainability improvements.

Benefit for Industry

The insights and methodologies developed during the SWIRO project have broader implications for the red meat processing industry. By demonstrating the effectiveness of real-time metering, data analytics, and predictive maintenance, the project provides a roadmap for other processors to follow. The resource savings achieved can be replicated industry-wide, offering potential for significant environmental and financial benefits. Additionally, the successful use of business intelligence software, such as PowerBI, highlights the value of integrating operational data with resource management systems. This project also supports compliance with environmental regulations and helps processors meet sustainability targets, which are increasingly important for both regulatory and consumer demands.

Useful Resources

Siemens Magnetic Flow Meters: <https://www.siemens.com/au/en/industries/water/magnetic-flow-meters.html>

Used for reliable water flow measurement in the plant.

RedLion Flex Edge Controllers: <https://www.redlion.net/flexedge>

Responsible for protocol conversion, visualisation, and sending data for further analysis.

Schneider PowerTag Components: <https://www.se.com/au/en/product/A9MEM1590/>

Used for efficient power metering.

Microsoft PowerBI: <https://www.microsoft.com/en-us/power-platform/products/power-bi>

Deployed for advanced data analytics and reporting.

Econoliser: Considered for knife sterilisation

Inductive Automation Ignition: <https://inductiveautomation.com/ignition/>

Planned for future SCADA system expansion to handle growing data needs.