Case study – Foodworks Southbank

Introduction

Foodworks Southbank is a small independent supermarket (650m^2 trading floor), just south of Melbourne's CBD. It offers a wide range of products, including fresh meat, dairy, produce, liquor, frozen goods, and non-perishables along with a grab-and-go section for busy professionals. The store's refrigeration system operates off a centralised rack setup, with the plant located in the car park level above the retail space. The refrigerated display cases in the store (for meat, dairy, liquor, and produce) are open, vertical cases, manufactured by Austral Refrigeration in 2010.

The catalyst for change

The Southbank store is relatively small and the cold air spill from the open refrigerated cases was making the store uncomfortably cold, especially during winter. Furthermore, these cases were highly inefficient and becoming increasingly costly to operate, particularly in the wake of rising electricity costs following COVID-19. Between September 2020 and August 2021, the store consumed 397 MWh of electricity costing over $83,000 (roughly $7,000 per month). Customer complaints regarding the store temperature prompted Operations Manager, Fady Malek to recognise the need for change. He realised that improving customer comfort and addressing escalating electricity costs were essential steps for the store's long-term viability.

Energy Efficiency project

Fady reached out to AJ Baker & Sons – Baker Refrigeration, a market leading refrigeration company specialising in a 'cradle to grave' approach to the design, installation, service, and maintenance of commercial refrigeration systems. Baker Refrigeration are an AUR-approved supplier with extensive experience in similar refrigeration upgrades.

Baker Refrigeration completed a full assessment of the site's refrigeration and provided a detailed proposal to Fady; they were subsequently engaged to complete the project.

The project plan was to retain the existing refrigerated display cases but retrofit them with world-leading double glazed doors to improve insulation and reduce heat ingress. Additionally, the fluorescent tubes inside the cases were replaced with energy-efficient LED lights and case fan velocities reduced to provide air circulation rather than an air curtain.

Retrofitting doors onto open cases substantially reduces the refrigeration load on the plant. This required a control system upgrade, including new parallel-compressor rack controllers and variable speed drive (VSD) to enable the system to adjust to the lower load and operate with minimal power consumption, reducing energy-wasting start/stop cycles.

While replacing the open cases with new, high-efficiency models was considered, the age of the existing units made the door retrofit the most cost-effective solution. An added benefit to the retailer with retrofitting doors is minimal decline in sales with the

display cases remaining in service throughout the process; stock removal and relay is also not required.

Medium-temperature refrigeration typically accounts for 40% of grocery store energy use. The upgrades were expected to cut power consumption by 60% for the refrigeration system, saving about 20% of the store's total energy use.

Work began on May 1, 2023 and was completed by May 17, 2023, including doors, lights, controls and plant optimisation.

Victorian Energy Upgrades (VEU) program

The Victorian Government provides financial incentives for energy efficiency upgrades through the Victorian Energy Upgrades (VEU) program. The VEU encourages the installation of new, energy-efficient technology in lighting, refrigeration and air-conditioning. It also offers a Measurement and Verification (M&V) method, which supports energy improvements to existing equipment, such as those implemented at Foodworks Southbank.

M&V measures electricity usage before and after upgrades, adjusting for ambient temperature differences to ensure accurate energy savings calculations. These savings are "forward created" over the equipment's lifespan, generating carbon certificates that can be traded for financial rebates, improving project Return on Investment (ROI).

To claim the rebate, Fady engaged Expert Group, an independent consultancy specialising in refrigeration and energy efficiency. With a proven track record of claiming rebates for sixteen previous door retrofit projects using M&V, Expert Group had the technical expertise and experience to manage the rebate process.

Project Outcomes

The Foodworks Southbank upgrade delivered energy savings that far exceeded original expectations.

The M&V process compared energy usage over a 12-month period before and after the upgrade. From June 1, 2023 to May 31, 2024, electricity consumption dropped to 237 MWh, representing an annual saving of 160 MWh, a 40% reduction compared to the baseline. This resulted in bill savings, with monthly electricity costs dropping by approximately $1,680 despite rising electricity prices.

In December 2024 the VEU programme approved the M&V project with a rebate of $54,800. The rebate along with ongoing electricity savings led to project ROI being realised in under six months.

The project successfully achieved its goals, with a more comfortable shopping environment and significant reduction in energy costs. The new doors and LED lighting have revitalised the store's refrigerated cases making them look like new, enhancing the store's merchandising appeal. Additionally, the more stable temperatures achieved by the doors have improved the shelf life of meat and dairy products.

The combination of better store aesthetics and improved operational costs has strengthened the store's competitive position against a new Woolworths that has opened nearby.

The successful refrigeration upgrade has demonstrated the benefits of reinvesting in an existing store to build a more resilient and sustainable business. Customer and staff comfort have improved, leading to higher satisfaction levels and the potential to attract new customers despite strong competition. Business partners Fady and Ehab are now able to focus on new business opportunities, including acquiring another store where they plan to replicate these energy efficiency upgrades.

A word from Fady Malek:

"On behalf of Foodworks Southbank, we would like to express our absolute delight with our dealings with Graeme Dewerson from Expert Group. Graeme has made the process seamless with his communication skills. He has left no stone unturned with his thorough submissions. We are over the moon with the results. Not only did we pay off the project in a matter of months and are enjoying great saving on our energy bills but our customers are also very happy not having to feel cold and rushed while shopping."

Project Contacts:

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Dairy and deli section, before and after the upgrade

Liquor section before and after the upgrade