Snapshot Report

AMPC
AUSTRALIAN MEAT PROCESSOR CORPORATION

RaaS

Refrigeration as a Service – Stage 1 on pathway to superior energy efficient refrigeration

Project Code
2022-1071

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Project Description

The project aimed to demonstrate the viability and feasibility of Refrigeration as a Service (RaaS), as outsourcing alternative to conventional plant ownership on up to three (3) processor sites. In this model, plant ownership as well as responsibility for maintenance, insurance and energy cost would reside with the RaaS service provider and not the processor.

Developing a RaaS proposal for a meat processor is unique per site and somewhat complex due to the specific cooling and heating needs of each site as all processor sites vary substantially in production volume, species, and type of production processes, and in relation to site service costs and availability. Developing a RaaS proposal is therefore not trivial, nor is the viability of RaaS a given for every site.

Each participant site would undergo detailed monitoring of energy and services use as well current plant load and performance to fully understand heating and cooling demands across a production cycle (typically at least I week)

Once monitoring data is available, a detailed engineering study to determine the optimum plant design of either a new, replacement refrigeration plant (or of an upgrade I retrofit for the existing plant) would be conducted to achieve lowest total ownership costs.

Based on the observed operating data (= cooling and heating consumption) and the developed refrigeration plant design, energy use, capital costs and maintenance costs for the proposed plants will be estimated, and a RaaS proposal prepared for consideration by each site, detailing the fixed monthly costs (capital and maintenance) and expected variable costs (cooling and heating used).

Project Content

The initial project stages addressed the steps required leading up to the development of a RaaS proposal, including:

1) Identifying target sites (Milestone #1)
2) Scoping each site to understand existing heating and cooling services (Milestone #2)
3) Preparation of a monitoring plan for each site suitable to secure the requisite information (Milestone #3)
4) Installation and commissioning of cloud-based monitoring systems (Milestone #4)
5) Analysis of data gathered from monitoring systems (Milestone #5)
6) Development of specification for upgraded refrigeration systems (Milestone #6)
7) Energy modelling of each site to understand savings achievable (Milestone #7)

The information gathered with these steps provided enough information to assess whether Refrigeration as a Service can provide benefit to both the business and the provider to ensure a productive long-term relationship.

Initial analysis by Minus40 showed that whilst the first two criteria were well in place for Beaufort River Meats, insufficient energy savings in proportion to capital investment required were achievable at VV Walsh. Minus40/AMPC therefore decided to switch to the fallback site (Hillside Meat Processors) for the next stage of RaaS proposal development, which was then conducted, and the results presented to BRM and HMP, as reported in Milestone Report #8.

Subsequent to the completion of the RaaS proposals, and alternative opportunity to potentially improve the scope of the savings achievable at VV Walsh was identified by way of the Maestro technology recently developed by Beca. As a subsequent project, Minus40 will propose the implementation of Maestro at VV Walsh as an alternative pathway to a RaaS solution.

On every site considered (BRM, HMP and VV Walsh) energy savings both as electricity savings and fuel (LPG, Diesel or Natural Gas) where identified, providing substantial potential environmental benefits and decarbonisation potential to the respective site.

Project Outcome

The project has demonstrated a methodology that can be utilized to determine if Refrigeration as a Service is a viable option for a processing site, whilst simultaneously providing insights on energy usage and energy savings opportunities for the site. The stages in this process would include:

1) Scoping the site to understand existing cooling and heating systems.
2) Develop and implement monitoring systems to provide accurate data (power, flow, temperature) of the heating/cooling systems.
3) Analysis of data to understand quantum and usage profile of energy use.
4) Develop upgrade plans and estimate the capital costs and savings potential, under a well-managed RaaS solution.
5) Conduct commercial modelling to develop a long-term RaaS proposal to achieve the energy savings (and additional site management savings).
6) Present (and subsequently revise and fine-tune) the RaaS proposal to the site.

On completion of the project, the three sites that ultimately participated in this project were at various stages of consideration:

1) Beaufort River Meats are planning to re-open the project folder in October 2023 once other unrelated business decisions have been implemented.
2) Hillside Meat Processors are planning to request a revised (reduced) RaaS project scope to now not include site expansion, but also subject to other unrelated business decisions.
3) VV Walsh remain keen to consider RaaS even though initial analysis does not justify RaaS on energy savings alone. A further project involving Maestro remote optimisation technology is current being prepared as a potential alternate pathway.

Benefit for Industry

Facilitating RaaS has several significant benefits to the industry:

1. Capital becomes available for core functions, such as production equipment, and not for service provision.
2. Management time becomes available for core functions and not for managing refrigeration services. Management of the refrigeration systems is outsourced to a competent and commercially incentivised party.
3. Uptime of cooling (and heating) is outsourced and guaranteed with consequences to the RaaS provider if cooling/heating is out of spec.
4. Energy costs are predictable and guaranteed.
5. Maintenance costs are predictable and guaranteed.
6. Return on capital deployed is higher due to refrigeration being off-balance sheet.
7. Environmentally responsible solutions can be employed due to focus on life cycle cost, reducing CO2 emissions and hence facilitating industry decarbonisation.