

MONASH INDUSTRY TEAM INITIATIVE (MITI)

Towards Zero Net Emissions - Understanding the Energy Profile of our Factories (VIC)

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BUSINESS PROBLEM:

For energy saving opportunities to be identified, the first step is to understand the detailed energy profile of the factories. This has become a more pressing concern due to both rise in energy prices as well as the increasing need to move toward zero net emissions by 2050.

PROJECT SCOPE:

The aim of the project was to develop a process flow diagram and a further site wide heat and mass balance. Subsequently, a utility model was developed to better understand the energy usage and distribution across the 3 Victorian sites. This information further led to identifying opportunities for energy savings around the various dairy processes.

PROJECT OUTCOME:

1. Process Flow Diagram (PFD):

Site-wide process flow diagrams were created, to understand the processes based on different product types.

2. Utility Model:

- Produced site wide Utility Model to illustrate the process incorporating the major equipment across different sections of the production line.
- Developed site wide Mass and Energy Balance, based on monthly average data extracted.
- The energy distribution specifically the heating & cooling loads across the site has been calculated and mapped.

MITI STUDENT TEAM:

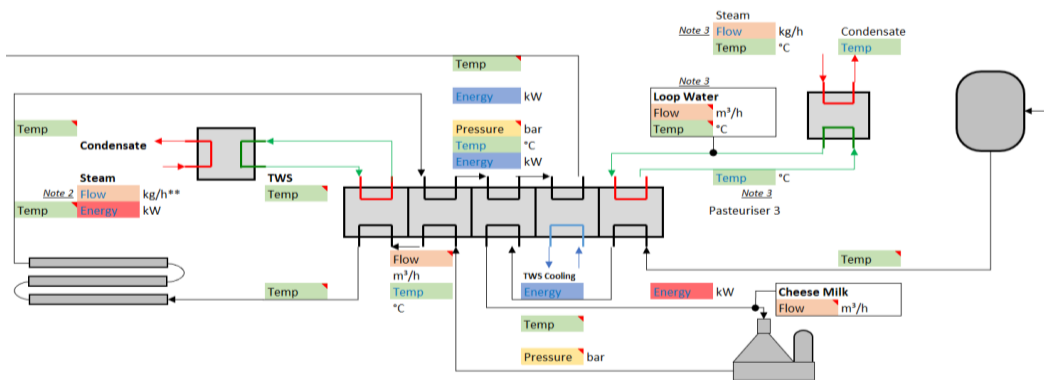


3. Establishing the energy baseline of each factory

- Modelling energy usage variation with production quantity
- Forecasting energy usage with changing production level
- Analysing energy intensity across production sites

4. Energy Savings Recommendations

- Installing oxygen trim controls to increase boiler efficiency
- Recover waste heat from certain product lines
- Re-use process heat to decrease load on boiler and chillers
- Recycle exhaust to utilize the heat energy present
- Optimizing boiler flush cycles using conductivity meters
- Identify information gaps currently present at the plants



LEARNINGS:

- Exposure to the dairy industry and the various industrial processes
- Collaborating within a multi-disciplinary team towards a common goal
- Developing tangible solutions to a series of real-world problems

FUTURE SCOPE:

- Implementing viable recommendations
- Add any process changes to utility model
- Add missing data from new sensors and data points
- Expanding pump ratings page when pump audits are complete
- Input data when according to production changes