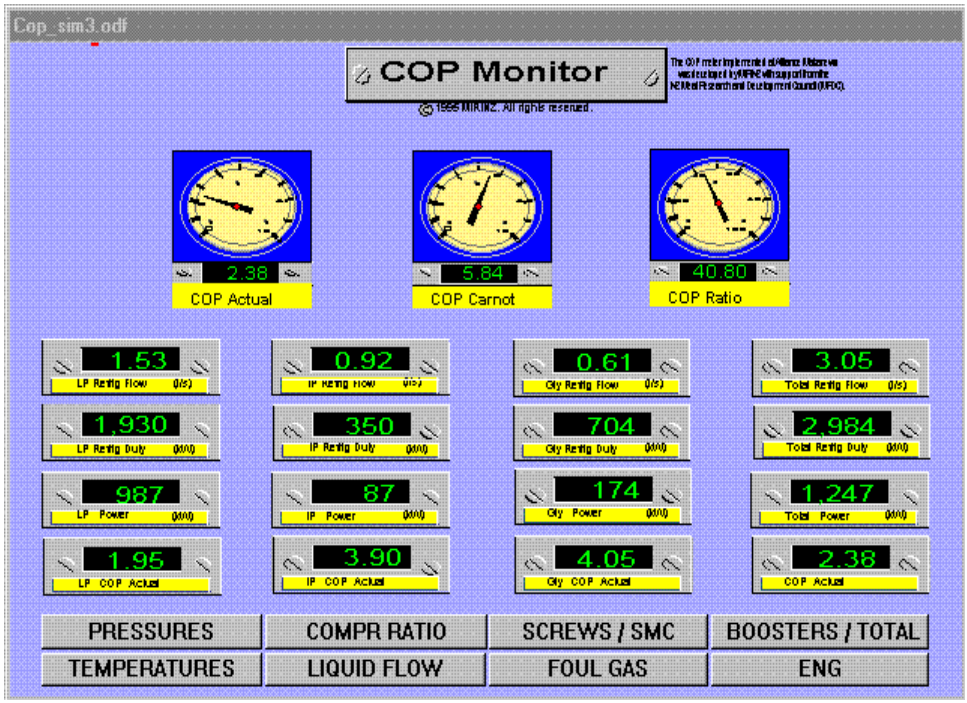
Coefficient of Performance Monitor

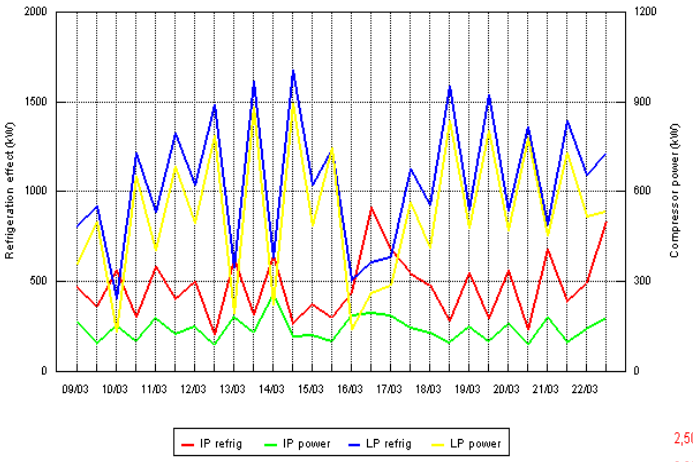
AgResearch MIRINZ

The *MIRINZ COP Monitor* will help you to:

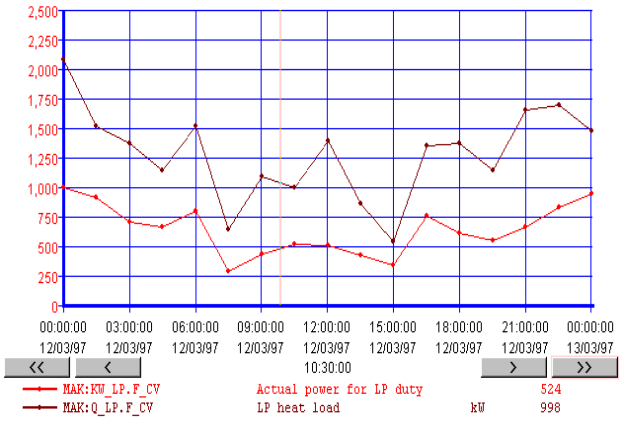
- **Ensure that site refrigeration demands are met with minimal energy use.**
- **Operate your refrigeration system more efficiently and reliably.**
- **Assess the benefits of design and equipment changes.**
- **Monitor COP on complex multi-stage refrigeration systems.**



The COP monitor measures refrigerant flows, calculates refrigeration system efficiency, and shows data clearly and in a useful format



Handles all types of industrial and commercial refrigeration and air conditioning equipment



Compatible with most modern SCADA and data logging systems

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COP Monitor

The MIRINZ Coefficient of Performance Monitor

Why a COP Monitor?

- The COP Monitor was developed to reduce the electricity costs of running refrigeration plant.
- It measures refrigerant flows and power usage, calculates COP's for complicated refrigeration systems, and presents the data in user-friendly form.

Engineers like the COP Monitor because. . .

- It gives refrigeration system operators the information they need to help them run their equipment more efficiently day to day.
- Once engineers know how efficient their plant is, they can optimize operating strategies and achieve significant energy savings.

The COP Monitor is a good investment because it. . .

- Helps users save money.
- Makes operators become more effective at their job.
- Helps engineers' benchmark equipment performance.
- Combats global warming by reducing CO_2 emissions.

Likely savings

- Benefit:cost studies for ammonia refrigeration systems using more than $NZ500,000 worth of energy p.a. have calculated savings of 10-15% and paybacks of 6-9 months on an investment of under $NZ50,000.
- Smaller systems, such as industrial air-conditioning plants can also save energy, using the C.O.P. Monitor.

Case Study

The first COP Monitor was successfully developed and tested at the Alliance Makarewa meat processing plant near Invercargill. In the meat industry, electricity to run chillers, freezers and cold stores is usually the largest single energy cost, with electricity costs ranging between $200,000 and $1 million per annum, depending on plant size. Similar sized systems are common in the food processing and cold storage industries.
The Makarewa installation helped refrigeration operators trim $25,000 from their electricity bill in year one.

- Early on, the operators used C.O.P. data to tune process control loops to reduce energy use.
- The C.O.P. Monitor showed energy savings of $10,000 from replacing a worn out compressor, giving the plant engineer confidence to proceed with further upgrades.
- The engine room operators used C.O.P. data to select optimal manual control strategies, yielding a gradual improvement in energy efficiency over several months.

Since the installation of the C.O.P. Monitor, Makarewa has trimmed their engine room energy cost by 12.5%. Further savings are expected through improved control and targeted equipment upgrades.
The new technology was released to the food industry and cold storage companies in April 1998 and several installations are currently under way.

The following modelling and design software programs are also available from the Refrigeration and Energy Team

***FPM*:** Food Product Modeller, used to evaluate chilling, freezing, thawing and heating processes for almost any food product
***RLA*:** Refrigeration Loads Analyser, used to evaluate the heat loads of chillers, freezers, cold stores and plant engine rooms.

Want to know more?

If you spend more than $40,000 a year on refrigeration electricity costs, the MIRINZ COP Monitor could be for you.

To find out the possibilities for your plant, contact us today for a feasibility study. As a first step, we will prepare a preliminary economic analysis, based on easy-to-obtain data for your engine room.

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