

MACHINE LEARNING CASE STUDY

Industrial Refrigeration Optimization



AI-Driven Advanced Process Control (APC)

SORBA.ai is a horizontal machine learning platform designed to be deployed and scaled easily.



www.SORBA.ai



info@sorbotics.ai

SORBA.ai

For Refrigeration

5%-10%
Improvements

SORBA.AI FOR REFRIGERATION:

The International Institute for Refrigeration (IIR) estimates there are approximately three billion refrigeration, air-conditioning, and heat pump systems in operation worldwide, consuming about 17% of the global electricity use¹.

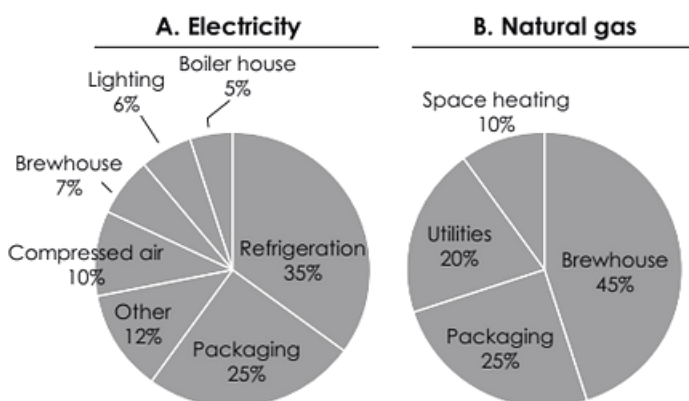
This accounts for an annual energy market of 8345 TWh² valued at about 1 trillion USD per year at average industrial electrical tariff³ and 4 billion tons of CO2 emissions⁴. Refrigeration demand is set to increase in the coming years⁵. The need to reduce global emissions highlights the importance of increasing the energy efficiency of refrigeration systems expeditiously.

SORBA.ai is deploying a Machine Learning (ML) solution for industrial refrigeration achieving 5-10% improvements in energy performance. This is a software-based solution that typically does not require infrastructure improvements, can be retrofitted, or incorporated into new systems and be easily deployed at competitive returns on investment. Solutions like SORBA.ai's refrigeration application have a global energy savings potential surmounting 53B USD per year, while offsetting more than 198 million tons of annual CO2 emissions. SORBA.ai's refrigeration solution is being applied across the world and is ready to be deployed at scale today.

THE FOOD & BEVERAGE CASE:

Energy Consumption In Breweries (All Sizes)

Data from the U.S. Environmental Protection Agency (EPA) show that refrigeration, packaging and compressed air consume 70% of U.S. breweries' electricity use (A), whereas the brewhouse dominates natural gas and coal use at 45 percent (B).



The United States Environmental Protection Agency (EPA) reports that the refrigeration systems in breweries represents 35% of their electrical demand. SORBA.ai partnered with a large global brewery to deploy ML based optimization of their refrigeration facilities. The solution was successful, showing 5-10% improvements in the refrigeration systems energy performance in plants in Brazil, Mexico, USA, Germany, and China. The solution is currently being scaled to another 30 plants worldwide.

THE MACHINE LEARNING SOLUTION:

SORBA.ai advanced process control (APC) adjusts suction pressure, discharge pressure and/or cooling tower adjusting temperature setpoints in real time to improve system COP (Coefficient of Performance). For any given operating condition, the model will look at those controllable variables to see what trends led to an improved COP within the plant's historical data. It then monitors the plant's process variables and produces optimal setpoints in real time to achieve a higher COP, moving the plant from its baseline operating condition up towards the optimal line as shown below.



Example APC heuristic, maximize isentropic COP to maximum temperature difference between plant loads and cooling tower wet bulb temperature.



✓ **8-10 weeks**

Typical Project Duration.
(2weeks training time).

✓ **6-12 months**

Typical Project ROI.



Artificial Intelligence



**SCAN TO
BOOK A
DEMO**

