

KOMATSU CASE STUDY

Efficiency Revealed

Lighting Controls

- ✓ 51% reduction in annual kWh
- ✓ 164MWh energy saved annually

HVAC Controls

- ✓ 25% reduction in annual kWh
- ✓ 80MWh energy saved annually

SITUATION

Komatsu provides essential mining equipment, systems and solutions used by companies worldwide to extract the fundamental minerals for developing modern infrastructure, technology and consumer products.

Since 1921, Komatsu has stood for unrivaled quality and reliability. Their enduring global success stems from the principles of their founder, Meitaro Takeuchi, who envisioned a sustainable future built through quality, technological innovation, globalization, and talent development.

These defining principles, along with an emphasis on safety, compliance, and social responsibility, are a part of the Komatsu DNA. Komatsu is committed to minimizing the impact on the environment by working toward common goals to reduce CO2 emissions, energy use and water consumption; creating net zero facilities that advance Komatsu's operations sustainably.

Tasked with putting these initiatives into practice, Sam Beans, the facility manager of the Longview, Texas manufacturing facility, began investigating ways to save energy in their storage warehouse. Constructed and occupied in 2019, the facility was outfitted with high-bay LED luminaires. The building also has 10 roof-top HVAC (Heating Ventilation and Air Conditioning) units (RTU) responsible for conditioning the space.

LIGHTING

Even though the new warehouse was outfitted with energy-efficient LED luminaires, the facility's management team knew there were more energy-savings opportunities. The lights in the facility would run 24/7/365, even when the building was unoccupied. The warehouse operated 2 shifts Monday through Friday and another shift on Saturday. During these active shifts, employees would periodically come in and out of the building to move inventory. Different areas of the building would see activity during the day, but rarely would all the lights need to be on at 100% throughout the day. Plus, on Sunday, there was rarely anyone in the space. At full brightness, the LEDs pull 37 kW, which over the course of the year, would amount to 322 MWh. Given corporate sustainability initiatives looming over them, the team also wanted to invest in a solution that could be expanded to monitor and control other systems.

HVAC

The other big energy consumer in the warehouse was the HVAC system, made up of multiple roof-top units (RTU). Each of the RTUs operated independently and were controlled by an individual thermostat on the wall of the warehouse. Individual thermostats would have independent setpoints and there was no coordination between units. This lack of a uniform conditioning strategy was exacerbated by individuals on the warehouse floor modifying the setpoints to maintain their own level of comfort, especially during the summer months when most of the energy consumption occurred, with outdoor temperatures peaking above 100 deg F. Each RTU would not operate at peak efficiency, often competing with each other in never ending cycles, which would lead to additional energy waste. The annual consumption for heating/cooling the warehouse was 330 MWh.

SOLUTION

SimplySnap, Synapse's wireless energy management system, was chosen to improve the energy performance of both the HVAC and lighting system. Additionally, as Komatsu learned after the system was installed, SimplySnap also highlighted maintenance and performance issues, beyond those just related to energy. Not only was the system evaluated on its ability to implement these energy-savings strategies, but also the project needed to meet a stringent 2-year payback.

SimplySnap met both of these challenges.

LIGHTING

The team wanted to have the capability of schedules, zones, and the ability to implement task tuning. With Fixture-level lighting controls, occupancy, and scheduling provided balanced lighting and energy consumption. The lights were only on during scheduled work times and areas that were not occupied were dimmed down to lower levels or turned off. Plus, utilizing natural light from the skylights in the warehouse, additional savings were captured. By implementing SimplySnap's open-loop daylight harvesting, specifically designed for high-bay spaces, lights would dim during the brightest times during the day, racking up more energy savings.

HVAC

The facility management team wanted to optimize the control and performance of the disparate RTUs controlling environment within the warehouse. SimplySnap provided the team with a whole-building thermostat control. Rather than individual systems and thermostats operating independently, SimplySnap controlled the RTUs all as one system, optimizing compressor loading and reducing energy usage while increasing overall equipment life. Plus, with SimplySnap Energy Insights and Condition Monitoring, the facility and maintenance staff were able to monitor power consumption, ambient temperature, and humidity.



INSIGHT

“After installing the SimplySnap power monitoring aspect of the HVAC control in one of our buildings, we were able to see unit issues based on changes in temperature and power consumption. We were able to tell when compressors stopped working as power usage was just the fan running. Power monitoring also enabled us to validate the units performed after repairs.”

SAMUEL BEANS // Facility Electrical Engineer

RESULTS

LIGHTING

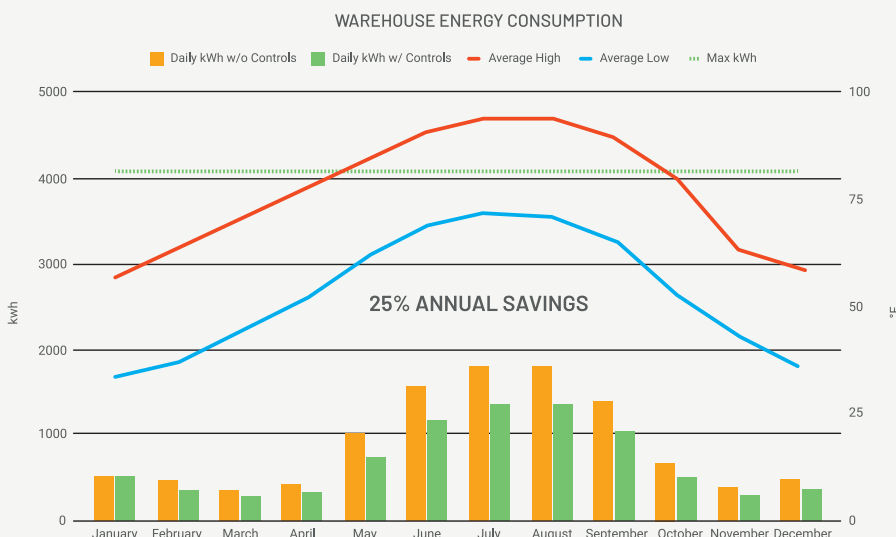
- ✔ Energy - Over 50% reduction in annual kWh with occupancy and schedules.
- ✔ Early detection of issues provides timely maintenance for enhanced safety and manufacturing up time.
- ✔ Komatsu will save over 164MWh of energy in a year.

Additional benefits were also discovered after SimplySnap was installed. Occasionally, lighting drivers or the entire LED luminaire would fail. Especially over the central racking area, these lights are necessary for operation of the facility. SimplySnap allowed for notifications to be sent to the maintenance staff when one of these lights failed so that plans could be made for repair.

HVAC

- ✔ Energy - Over 25% reduction in kWh by managing the whole building rather than individual thermostats.
- ✔ Komatsu will save over 80MWh of energy for the year.

Although, not in the original scope of the problems Komatsu was trying to address regarding energy consumption, the data available within SimplySnap provided insights to the team regarding maintenance and performance issues with the HVAC RTU. The insights from the power and temperature data enabled rapid response by the HVAC contractor to resolve issues within the warranty period. Subsequent monitoring allowed for the validation of repairs.



Implementing the whole-building thermostat within SimplySnap resulted in immediate energy savings within the facility.

MOVING FORWARD

“We plan to continue to use the data and control to further reduce our energy consumption as well as pinpoint equipment issues before they impact production.”

SAMUEL BEANS // Facility Electrical Engineer

SYNAPSE CONTROL PRODUCTS

1



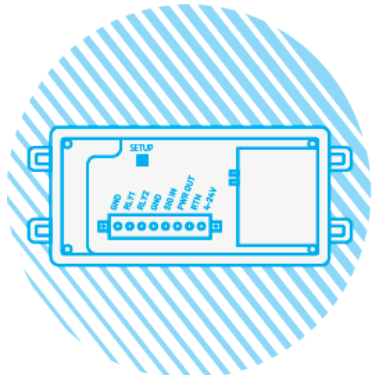
2



3



4



1. Control Thermostat
2. Luminaire with embedded Synapse Controls
3. SS450 Site Controller
4. Sense 4-20

Visit www.synapsewireless.com to learn more or speak with one of our sales representatives.