

LOUPEi

QUICKFACTS

- **400,000 m³** cooled warehouse
- **S\$ 800,000** annual HVAC electricity bill
- **18-25 °C** indoor temperature range
- Control of **154 FCUs** (ON/OFF, temperature, fan speed)
- **S\$ 300,000** saved / year
- **37% reduction** HVAC electricity consumption
- **1,000 tons less CO₂** emissions per year

Air-conditioned Logistics Centre, Singapore

Nowadays, the industrial sector consumes **more than half of the world's total energy**. With **large cooling requirements and complex automation systems** running 24/7, logistics companies need to take action to **reduce their energy-intensive process and avoid operational issues** to make their **facilities as efficient as possible** while making sure that **goods are stored within the right conditions**.

Background

DHL is a large multi-national and one of the world's **leading logistics company**, with presence over 200 countries.

A new site was launched in Singapore in 2016 to host the **DHL Supply Chain Innovation Centre in Asia Pacific** as well as a pioneering multi-customer warehousing area equipped with **cutting-edge technologies and systems**.



Challenges

Despite the modern equipment deployed, the facility management team engaged LOUPE I to resolve the suboptimal operation of its VRV (Variable Refrigerant Volume) systems and reduce carbon footprint.

LOUPE I was commissioned to address different challenges faced by the warehouse:

- **The temperature within the warehouse was heterogeneous**, meaning that there were hot and cold spots in some areas of the warehouse. As a result, the goods stored could **suffer from high/low temperature** and changing conditions
- The logistics facility is an **energy-intensive consumer**, where the **maximum power demand** plays a large part on the total electricity bill. Reducing the power demand is as important as minimizing the energy consumption
- The **lack of energy expertise** and overview of the whole HVAC system caused **wasted time** to find sources of drifts and errors by the maintenance team, even during emergency interventions

Escalating energy costs and a **strong sustainability strategy** led the company to seek for a reliable solution to limit overall energy costs as well as reducing the facility's carbon footprint

Solution

LOUPE I's first optimization strategy consisted in **homogenizing the temperature** within the whole facility, by automatically **adjusting FCU setpoints according to forecasted external weather conditions and internal activity peaks**. LOUPE I's software elaborates the optimal strategies and translates them into control orders that are automatically transmitted to the FCUs.

Collecting data from the BMS and external platforms (weather and activity forecast) and using prediction algorithms, allow the **anticipation of future needs to minimize the use of energy while always respecting temperature constraints**. Leveraging multiple sources of savings in real-time such as energy efficiency, energy conservation and power peak shaving lead to a **maximum of savings on the HVAC system energy costs**.

Thanks to the connection to the site's equipment and the automatic data evaluation and analysis, the software can **help on-site maintenance teams**. LOUPE I's solution automatically **identifies, reports and diagnoses errors and drifts, and suggests actions** for smooth maintenance interventions.

S\$ 300,000

savings on the annual electricity bill

- 37%

annual HVAC energy consumption reduced

1,000 tons

lower CO₂ emissions & carbon footprint

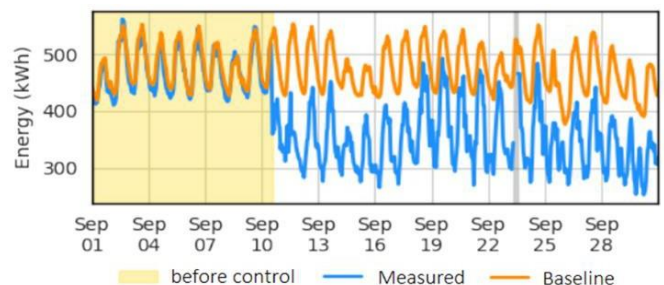
LOUPEi



Results

- Stored goods are now benefitting from homogeneous temperature/humidity
- **Improved efficiency and faster reaction** of Facility Management and maintenance teams' interventions
- Reduced site electricity bill thanks to a **37% reduction on the HVAC system energy usage**

Consumption without LOUPE I (orange) and consumption with LOUPE I (blue) over 2 weeks



Testimonial

"The positive impact of having an energy-efficient warehouse goes beyond the dollars and cents. Besides enabling us to make strides toward our goal of reducing our carbon footprint, introducing energy-efficient measures will also help create a carbon-free logistics sector in the long run."

– Cham May Lin, Assistant Manager, Operational Excellence, DHL Supply Chain Singapore