



Cooling as a Service
Refresh the planet

Case Study



Singapore Data Centre and Manufacturing Facility Saves with Cooling as a Service

When evaluating the options available for retrofitting 7000 AMK's aging cooling system, the owners turned to Kaer to engage in a Cooling as a Service contract to benefit from the most reliable and sustainable solution.

Country/Region

Singapore

Sector

Data centre/manufacturing

Retrofit OR New

Retrofit

**Project size
(cooling equipment)**

3,400TR (11,597kW) total cooling

Partners





Overview

Although relatively small and with average temperatures of 30-34°C (86-93.2°F) all year round, the island of Singapore is a highly desirable location for data centres due to its strong economic outlook, stable political and regulatory environment, and reliable infrastructure.

This has resulted in an explosion of data centres across the island with many more planned in the coming years. Leaving Singapore with a major question to answer. Where will they get the power?

Data centres are well known energy guzzlers with one of the major contributing factors being the massive air-conditioning systems required to combat the large quantities of heat being produced by the IT equipment.

Background

Owned by ESR-REIT, 7000 AMK is a 92,903m² (1 million ft²), 24/7 mission critical facility housing large data centres as well as high-end manufacturing for mobile phone camera lenses.

In 2014, when evaluating the options available for retrofitting their aging cooling system, the facility's owners decided to consider servitisation to improve the sustainability of their air-conditioning system without having to bear the immediate financial burden of purchasing a whole new system themselves.

Servitisation is something local service provider, Kaer, is very familiar with and already has a great deal of experience in. As such, they were the ideal partner for this project.

How does the model work?

With Kaer's Cooling as a Service model, referred to as Kaer Water, instead of investing in and operating air-conditioning equipment, building owners simply dictate the chilled water temperature they want. Kaer assumes all financial and operational responsibility to deliver the chilled water and the building owner simply buys air-conditioning at a fixed \$/RTH rate on a pay-as-you-use basis.

This allows ESR-REIT to dedicate their time and capital to supporting their tenants whilst Kaer remains fully accountable for providing the conditions they need throughout the facility.

The solution

To accommodate the 24-hour mission critical requirements, Kaer took over the existing chiller plant of 8,000TR (28,135kW) and immediately installed its patented K-RealTime building monitoring and control system.

This allowed Kaer to monitor, measure, and track the performance and energy efficiency of the plant. K-RealTime consists of sensors and meters and runs the data through a cloud-based platform. The data is hosted on secure Kaer servers and engineers can view the data and make decisions around operating parameters, in real time 24/7, on an interactive user interface that can be accessed on a PC, iPad and smartphone.

Additional automation was added to the on-site control system, with the brIQs machine learning technology. brIQs is an autonomous optimisation tool developed by Kaer engineers to run chiller plants efficiently and provide reports and alarms to allow Kaer's engineers to

take preventive measures necessary to ensure that comfort and efficiency targets are achieved.

Upgrading the equipment

Initially, the facility's cooling was supplied by 17-year-old Trane chillers charged with HCFC-123. In 2015, due to the age and performance of the equipment, Kaer installed two brand new Trane 900TR (3,165kW) chillers with associated cooling towers and pumps with zero downtime and no disruption to the operations. These chillers provide chilled water at 7°C (44.6°F) and are charged with HFO-1234ze.

In 2016, additional capacity was added to accommodate increasing loads in the building with two 800TR (2,813kW) Carrier chillers.

Benefits and results

Data centres require 24/7 operation with N+2 redundancy. Thanks to Kaer's extensive experience in retrofitting 24/7 mission critical facilities without disruption to operations, they could deliver on this requirement – doing a full chiller plant retrofit without any downtime or disruption.

Another benefit is that brIQs as an autonomous optimisation technology is being applied at an industrial facility, delivering Green Mark Platinum levels of efficiency.

"The energy efficiency of the cooling system is 15% better than current Green Mark Platinum benchmarks," confirms Dave Mackerness, Leader of the Customer Success Team at Kaer.

Also, the facility now boasts fully automated operations, resulting in a 90% reduction in manpower to operate the plant.

The customer was very happy with the end result, according to Mackerness. "The ability to pay as you use and upscaling of the plant to match the upscaling of their requirements over time."

Contact Information

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