GLOBAL TECHNOLOGY FIRM

A Vertiv Case Study

ABOUT THE COMPANY

This global technology firm was able to reduce total data centre energy consumption by as much as 33% by applying Vertiv's eCap™ energy optimisation services.

Case Summary

The Situation

The customer underwent a major data centre reorganisation in 2015. The relocation of its IT equipment offshore presented significant challenges to the existing power and thermal infrastructure supporting the new reduced IT load in their Sydney data centre.

One of the challenges facing the firm was to determine the inefficiencies caused by relocation of its IT assets. At the same time, it wanted to reassess the capabilities of its three 63KW CRAC (computer room air conditioning) units that were approaching end of life.

With increased focus on environmental sustainability, the firm engaged Vertiv to provide a detailed analysis of energy usage in the room and to build a business case identifying the full optimisation potential within the computer room.

Location: Australia

Solution

- eCap™ Energy Optimisation Service

Preliminary Results

Vertiv's energy optimisation team was enlisted for technical advice. A free, two hour walkthrough of the firm's data centre was conducted to identify energy consumption and savings opportunities. Non-intrusive instrumentation was also used to capture detailed energy consumption in the data centre.

Initial feedback from the walkthrough indicated significant savings could be achieved through:

- Replacing two 63KW CRAC units that were at the end of life with two new Liebert® PEX 30KW units with built in digital scroll compressor and variable speed fans.
- Implementation of the eCap™ optimisation service that would ensure maximum efficiency from the newly installed CRAC units. Potential energy savings were indicated in excess of 40% related to the cooling system within the data centre.
- Generate Energy Saving Certificates (ESC's)

Based on this feedback, the firm instructed Vertiv to proceed with a comprehensive analysis that would verify energy savings and ROI timelines.

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eCap™ Energy Optimisation Process

Step 1: Metering and Verification

Sophisticated metering and verification equipment collected data from the IT equipment, tracking energy usage in real-time while creating a historical log of energy consumption. The data collected enabled the optimisation team to generate meaningful pPUE (partial power usage effectiveness). This is a ratio between energy consumed by IT equipment and energy consumed by the thermal cooling equipment.

Step 2: Airflow Management

Airflow within the data centre space was then tuned to match the IT demand. This was achieved by employing low cost retrofits to the existing data centre equipment. This meant a significant reduction in the volume of cold air required by the IT equipment by over 75%. These reductions can be likened to leaving the fridge door open means you are wasting energy.

Step 3: CRAC Optimisation

Changes to the airflow following the reorganisation created a new environment within the data centre. Thus, the existing CRAC units were commissioned and recalibrated to operate efficiently within the new environment.

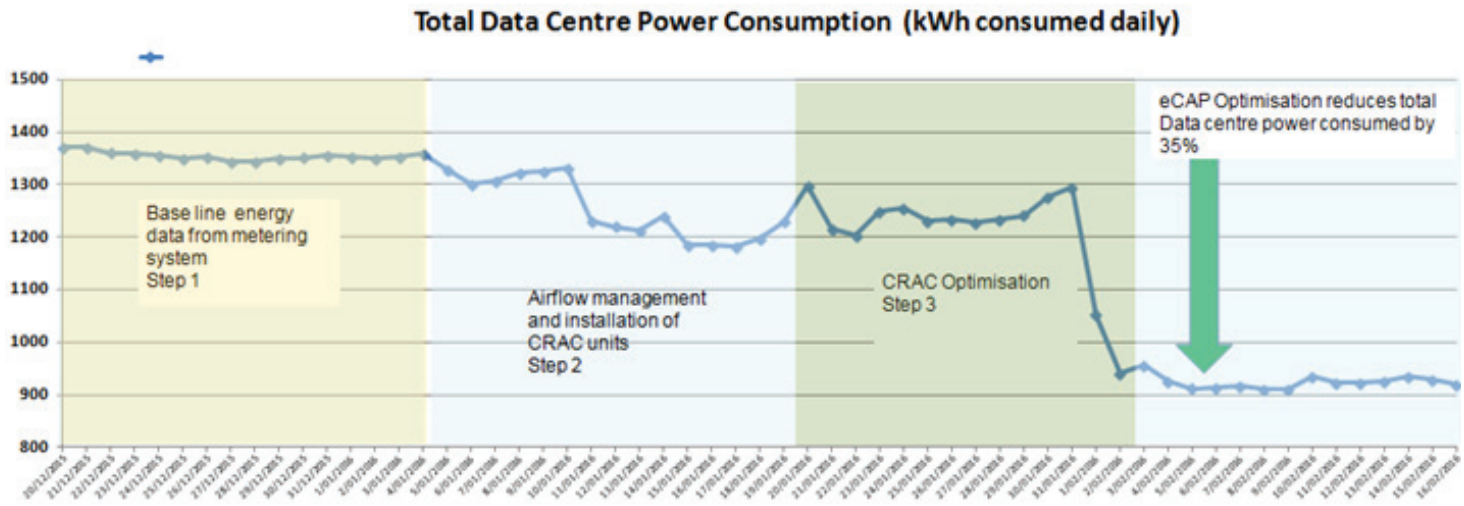

Table 1 shows the data collected pre & post implementation of the eCap™ service providing metering and verification of the total (CRAC and Uninterrupted Power Source) energy consumption within the Data Centre. The data reveals that average daily consumption fell from 1325.20kWh per day down to 926.13 kWh per day, representing a 32.5% reduction in the total energy consumed within the data centre.

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Solution

- Metering and verification of energy consumption throughout the project timeline
- Airflow management using existing Data Centre infrastructure (IT Racks & CRAC units), then applying complimentary retrofit equipment allowing the airflow to be redirected and providing a constant supply of cold air to the inlet point of the IT equipment within the white space
- Replacement of two ageing 63KW units with two units of Liebert PEX 30KW. Optimising the new CRAC equipment to operate within the new environment created by the airflow management.

Mark Deguara, director for Data Centre Solutions at Vertiv in Australia and New Zealand, said: *"The commissioning of the new CRAC units in isolation contributed to 4 to 7% efficiency in the room. However the vast majority of 32.5% in efficiency gains came from the eCap™ optimisation service."*

Moreover, while the initial walkthrough room audit indicated that the savings of the customer in cooling reduction would be around 45%, in reality, after 30 days of monitoring and fine tuning, Vertiv was able to achieve a 65% fall in consumption.

An additional $20,000 from ESCs (energy saving certificates) issued by the Office of Environment of Heritage in conjunction with the Independent Pricing and Regulatory Authority of New South Wales.

Summary

The eCap™ optimisation service allows the customer to capture the maximum savings or deploy up to 50% additional IT equipment using their existing infrastructure within a Data Centre room. This service requires the correct application of all three steps of the process identified above, while verifying reduction at the completion of each step.

Installing Vertiv's Liebert PEX thermal solution with digital scroll compressors and variable speed fans is only one part of the energy optimisation story. When the cold air leaves the CRAC units, this has to be segregated and managed through the room allowing the CRAC units to match airflow demand generated by the IT equipment, ensuring maximum efficiency are realised.

In addition, the ease of installation allowed the customer to have a newly optimised room in just a short period of time. The new room now requires a third of the energy it used to need, with potential savings of up to $16,000 annually.

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