

# Case Study: Global Switch

Maximising Energy Efficiency and Validating Design Decisions



## Key Information

### Client

Global Switch is a leading data centre owner, operator and developer globally

### Quick Facts

Client since: 2014  
Geography: EMEA, APAC

### Services

Energy Modelling, Predictive Analytics and Integrated Data Centre Operations

**“Using CBRE | Romonet, Global Switch can demonstrate the commitment to energy efficient data centres, and Global Switch’s customers can be confident that the declared PUE values are both accurate and validated by an independent party.”**

**Matthew Winter**  
Europe Project Director, Global Switch



### Contact Us

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## Background

Global Switch's Sydney West data centre is located on the western edge of Sydney's Central Business District, Australia's financial and commercial hub. As one of the largest colocation data centres in the Southern Hemisphere, the facility was designed to offer maximum resilience and security, and support a range of network and cloud providers including major international and national carriers.

With the data centre nearing full occupancy and experiencing on-going growth, Global Switch aimed to develop a second data centre on the same campus. Once complete, the new \$300 million Sydney East data centre would span 73,000 square metres of space with 83MVA of utility power capacity, becoming Australia's first hyperscale data centre campus.

## Challenge

From a design perspective, a key requirement for Global Switch was to deliver one of the most energy efficient and sustainable data centres in the region. Global Switch needed to ensure that it had selected an optimum infrastructure solution that would withstand Sydney's climate patterns and still operate at the desired efficiency levels. The solution also had to be flexible and provide best-in-class operations for its customers.

The company sought to verify its target Power Usage Effectiveness (PUE) with an independent body to hold suppliers and designers to task, and provide customers with a reliable and accurate analysis of the metric in its data centre.

## Solution

Global Switch retained CBRE | Romonet to model Sydney East over the life of the development and provide predictive data on efficiency levels for both initial occupation and the subsequent stages (2 and 3).

Additionally, CBRE | Romonet was charged with identifying designs that would achieve an annualised PUE of 1.33 for the facility, an ambitious target.

CBRE | Romonet’s modelling captured the cooling system design; a water-based thermal transport system using water-cooled chillers and cooling towers. The design was rigorously tested against annual weather data to establish the annualised PUE.

Global Switch was able to explore multiple permutations of the cooling system design within the model to determine an operationally efficient solution that represented favourable Total Cost of Ownership outcomes. This involved examining what improvement could be made—such as providing heat exchangers to bypass the chillers and deliver cooling without refrigeration for as much of the year as possible.

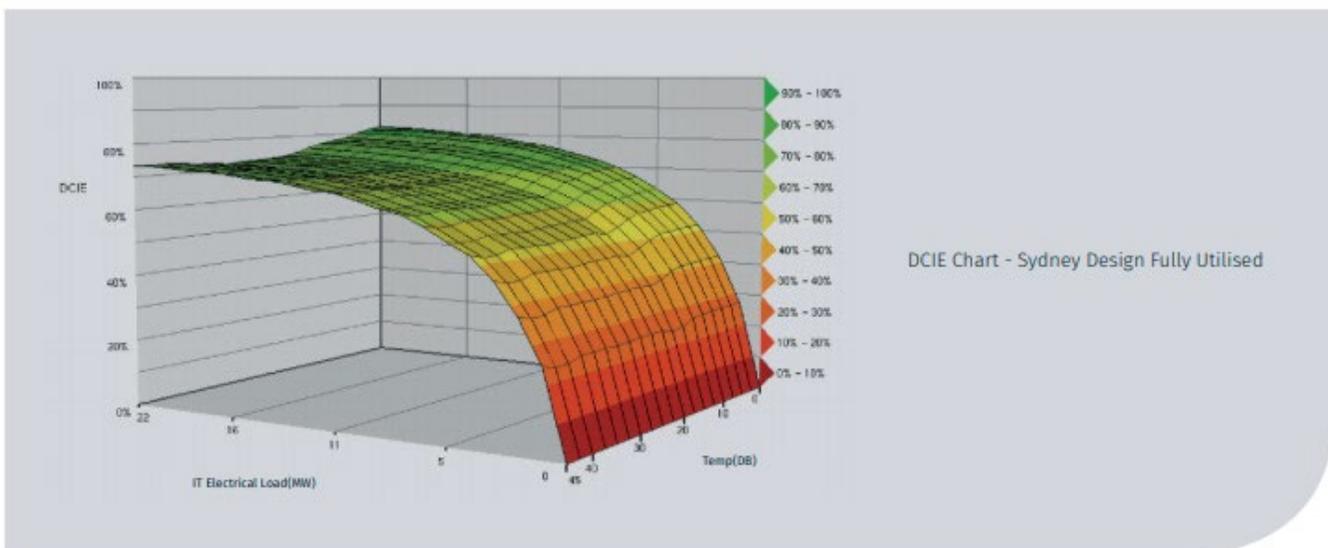
**“CBRE | Romonet’s predictive analytics has given what we believe is reliable and accurate insight into the future of the facility. With this model, the Operations Team is able to forecast and better understand the next steps of occupation for the remaining stages of Sydney East. We have analysed many of our sites across the globe with this tool and we value the information it provides as it assists the decision making when considering the manner of data centre investments.”**

Matthew Winter  
Europe Project Director, Global Switch

## Data Centre Infrastructure Efficiency

The chart below shows the temperature versus load relationship along with the corresponding efficiency and represents a particular static point efficiency. The annualised PUE is determined using this data but applied against a typical simulated weather file over 8,760 hours of the year.

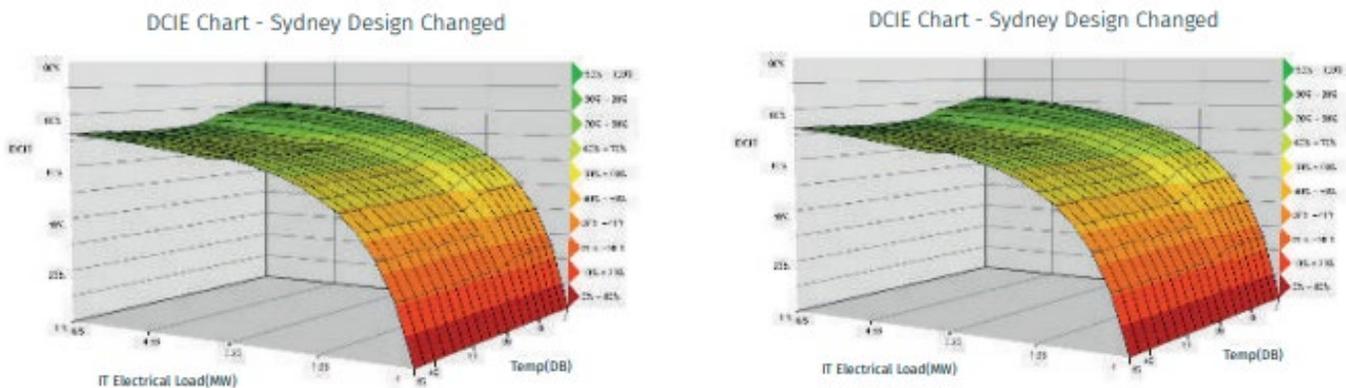
### Sydney East Data Centre Infrastructure Efficiency (DCIE)



As a result of CBRE | Romonet’s analysis, Global Switch is actively incorporating modifications to the existing cooling system to further improve PUE. This is best illustrated in the improvement of the DCIE as shown in the plots below (improvement shown on the right hand side). The visible step in the DCIE curve shows the free-cooling providing greater energy saving for the facility with the introduction.

These energy efficiency solutions are being applied into the design of Sydney East. With these improvements, Global Switch’s customers will receive a more cost-effective solution for housing and operating their equipment.

### Sydney East DCIE Improvements



**“With the next Stages (2 and 3) of Sydney East, Global Switch wanted to ensure the site was planned and operated accurately to provide customers with an extremely energy efficient facility. Global Switch has a strong commitment to environmental sustainability and social responsibility at all of its data centre sites. The design challenge for Sydney East was to identify the most cost effective solutions available to deliver verifiable PUE over the lifecycle of the building.”**

Matthew Winter  
Europe Project Director, Global Switch