

Case Study //

100 Queen Street, Melbourne

100 Queen Street is an iconic commercial office building in the heart of Melbourne's commercial and financial district. As one of the flagship corporate bases of ANZ, 100 Queen Street comprises 37 floors and was constructed in 1993 to complement the restoration of the heritage-listed former Melbourne Stock Exchange and ES&A Bank buildings.

The Challenge //

The HVAC systems at 100 Queen Street employ four chillers with a total capacity of 5,090kW as well as corresponding water pumps totaling over 200kW. The cooling tower fans have a total of 29kW. Airmaster have been conducting HVAC service and maintenance at 100 Queen Street on behalf of JLL, ANZ's Integrated Facilities Management partner since 2006.

Continued identification of energy reduction initiatives resulted in the recommendation of plant room optimisation solution PlantPRO to complement further efficiencies through planned chiller replacement works.

The Solution //

PlantPRO uses "Smart Sequencing" to optimize the chiller plant by running the most efficient combination of chillers for the given conditions even when some machines may be out of service. Smart Sequencing selects the most efficient load point for each running chiller, meaning that if a chiller goes below nominal efficiency, it can be proactively checked by service personnel minimizing electrical energy waste and avoiding compounding costly service issues.

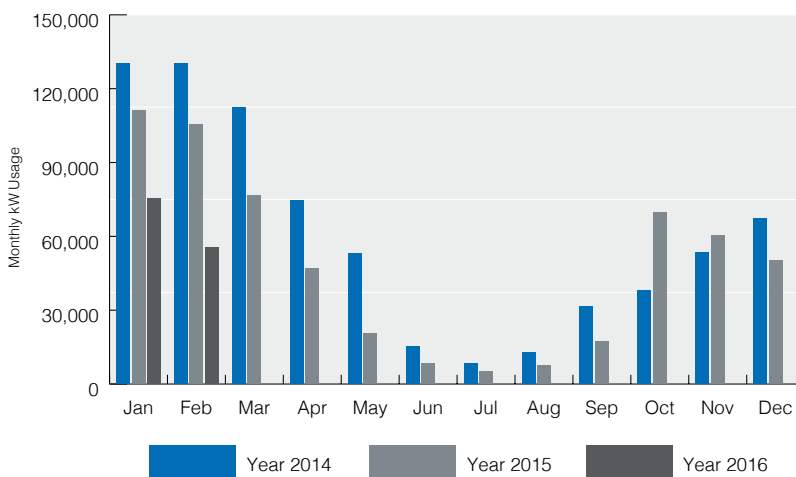
In addition to "Smart Sequencing", PlantPRO also optimizes the plant through advanced variable pumping control and lift optimisation on the refrigerant side. The sum of these strategies equates to industry leading plant performance levels that set an industry benchmark for energy efficiency. In December 2014, PlantPRO was installed and commissioned at 100 Queen Street, taking over control of the existing four chillers and associated pumps. Energy consumption was then monitored and compared to baseline energy consumption based on the previous year.

In conjunction with the installation of PlantPRO, Capital replacement works were undertaken that included the replacement of two of the four chillers that were over 20 years old and subsequently operating at sub-par efficiency levels. These works required PlantPRO to be switched off for the months of October and November 2015.



The Results //

Since PlantPRO integration in December 2014, an average monthly saving of 29.7%* was achieved in 2015 (when compared to 2014). The installation of the two new chillers has further increased efficiency to date in 2016. Due to the chiller replacement activities, PlantPRO was not in operation for the months of October and November 2015 (increased energy use as a result of PlantPRO isolation reflected in above graph). As a result, power consumption during these months has been excluded from this analysis.



PlantPRO Intelligent Optimisation //

Through a built-in feature of PlantPRO, chilled water conditions were maintained during periods where one or multiple chillers were offline. In the three-month period between December 2014 and February 2015, one of the building's 2000kW high load chillers was offline. During this time, PlantPRO's Intelligent Optimisation was able to produce over 1200kW of cooling out of the low load chillers that only have a combined Nominal rating of 1090kW. This is achieved by driving the chillers into "off design" conditions but at the same time carefully monitoring the chillers to ensure they stayed within safe operating parameters.

About Us //

Optimum Air is a technical solutions company, delivering end-to-end management of heating, ventilation, air conditioning, industrial and process cooling and building automation across New Zealand. Founded by Airmaster Australia, one of Australia's leading HVAC service solutions companies, Optimum Air draws upon the vast industry experience to deliver Airmaster's range of award-winning services and solutions to the New Zealand market.

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