

MIRVAC, SYDNEY CBD AND SOUTH EVELEIGH NSW

# Four plants, four control philosophies, one method

# 9.4–21%

measured plant energy saving across three verified assets, each against its own baseline

Mirvac's Sydney assets share neither a plant design nor a controls stack. Angel Place runs four PowerPax chillers of unequal size. 400 George Street runs three York centrifugals and a PowerPax. 8 Chifley Square runs two magnetic bearing York units. Building 1 at South Eveleigh stages three chillers across five levels. Controls span Honeywell and Johnson Controls Metasys, with telemetry through Switch Automation and Bueno.

Exergenics built a digital twin of each plant from its own trend data, bounded the strategy with constraints from each facilities team, and issued setpoints and sequences for the incumbent controls contractor to code into the existing BMS. No hardware was installed and no connection to the control network is maintained.

|                                                            |                                                          |                                                  |
|------------------------------------------------------------|----------------------------------------------------------|--------------------------------------------------|
| <b>20,656</b><br>kWr of plant optimised across four assets | <b>3 of 4</b><br>assets verified, 18,306 kWr of capacity | <b>Nil</b><br>capital expenditure, software only |
|------------------------------------------------------------|----------------------------------------------------------|--------------------------------------------------|

These are high-performing assets with strong NABERS ratings and competent facilities teams. The plants were still sequenced on fixed thresholds, with condenser water setpoints that didn't track ambient conditions. *Good buildings, conservative controls.*



|                                                                                                   |
|---------------------------------------------------------------------------------------------------|
| <b>CLIENT</b><br>Mirvac, commercial office                                                        |
| <b>PLANT</b><br>Four buildings, 13 chillers, 20,656 kWr                                           |
| <b>STRATEGY</b><br>Chiller sequencing and condenser water setpoints that track ambient conditions |
| <b>CONTROLS</b><br>Coded by each building's incumbent contractor into the existing BMS            |
| <b>DATA PLATFORMS</b><br>Switch Automation and Bueno, by API                                      |
| <b>CAPITAL EXPENDITURE</b><br>Nil. No hardware, gateway or control network connection             |
| <b>FIRST DEPLOYMENT</b><br>December 2022                                                          |
| <b>LATEST VERIFICATION</b><br>January 2024                                                        |

# Saving by asset, measured against its own baseline

Plant energy regressed against measured cooling load. Savings are stated over each site's own window and aren't annualised, so they shouldn't be summed into a portfolio figure.

| ASSET                                                 | ENERGY SAVING     | MEASURED OVER WINDOW                                                               |
|-------------------------------------------------------|-------------------|------------------------------------------------------------------------------------|
| 400 George Street<br>Sydney CBD · Verified            | <div></div> 21%   | 53,780 kWh · 43.0 tCO <sub>2</sub><br>123 days · R <sup>2</sup> 0.84               |
| Building 1, South Eveleigh<br>Verified, preliminary   | <div></div> 12.4% | 14,160 kWh · 11.2 tCO <sub>2</sub><br>Measured window, not 12-month                |
| Angel Place, 123 Pitt Street<br>Sydney CBD · Verified | <div></div> 9.4%  | 33,240 kWh · 26.6 tCO <sub>2</sub><br>265 days · R <sup>2</sup> 0.995              |
| 8 Chifley Square<br>Sydney CBD · Modelled             | <div></div> 16.4% | 47,493 kWh · 38 tCO <sub>2</sub> e modelled<br>Digital twin forecast, awaiting M&V |

## No two plants alike

A strategy generated for one plant would be wrong for the next.

|                            |                                                                  |
|----------------------------|------------------------------------------------------------------|
| Angel Place                | 4 PowerPax, 720 kW <sub>r</sub> and<br>3 × 1,700 kW <sub>r</sub> |
| 400 George Street          | 3 York centrifugal, 1<br>PowerPax · Honeywell                    |
| 8 Chifley Square           | 2 magnetic bearing York ·<br>Metasys                             |
| Building 1, South Eveleigh | 3 chillers, five staging<br>levels                               |

## How it was delivered

- 01 Use the data already collected. Trends by API from Switch Automation and Bueno. Nothing installed.
- 02 Model the plant, not the building type. A digital twin per plant from its own operating history.
- 03 Bound it with site knowledge. Off-limits sequences, unreliable plant and suspect readings, supplied by facilities teams.
- 04 Hand it to the incumbent contractor. Setpoints and sequences coded into the existing BMS.

### METHOD

Boundary is the central chilled water plant of each asset. Each was verified over its own reporting period against its own baseline, using a regression of plant energy against measured cooling load. kWh and carbon are savings within each stated window, not annualised. Carbon uses 0.80 tCO<sub>2</sub>/MWh, the factor in each M&V report. The South Eveleigh result is preliminary. The 8 Chifley Square figure is a modelled forecast and hasn't been verified. No cost savings are reported.