

RETROCOMMISSIONING A MID-RISE OFFICE BUILDING

A CHELSEA GROUP CASE STUDY

SUSTAINABILITY: OPPORTUNITY IN AN OLDER BUILDING

TAKE AWAY

Concept

- Apply advanced monitoring to the central plant
- Correct operational challenges to achieve savings

Features

- Real-time monitoring of equipment
- Optimization of CHW pumping
- Visibility of central plant operations data

Benefits

- Improved central plant operations
- Identification of further energy measures
- Utility rebates of 85% of costs
- Payback in less than 5 months

677 Ala Moana in Honolulu, owned by REDICO and managed by PM Realty Group, is an excellent example of an older mid-rise office complex. It has had many additions and renovations over its life and requires ongoing attention to remain competitive in the commercial office market. Like most properties it is important for 677 to stay competitive in its cost of operations as tenants look increasingly to the total cost of leasing space.

REDICO, like prior owners of 677, engaged Chelsea Group to help meet these challenges. Unlike prior owners, REDICO retained Chelsea Group to conduct a comprehensive sustainability analysis and develop a master plan for performance improvement. One of the key items identified in the plan was

retrocommissioning of the central plant. Fortunately for REDICO, their timing coincided with the introduction of an outstanding program for central plant retrocommissioning offered by Hawaii Energy, the entity administering utility rebates in Hawaii. The result was an excellent project that gave a financial jumpstart to sustainability at 677.



THE VALUE OF REAL TIME MONITORING

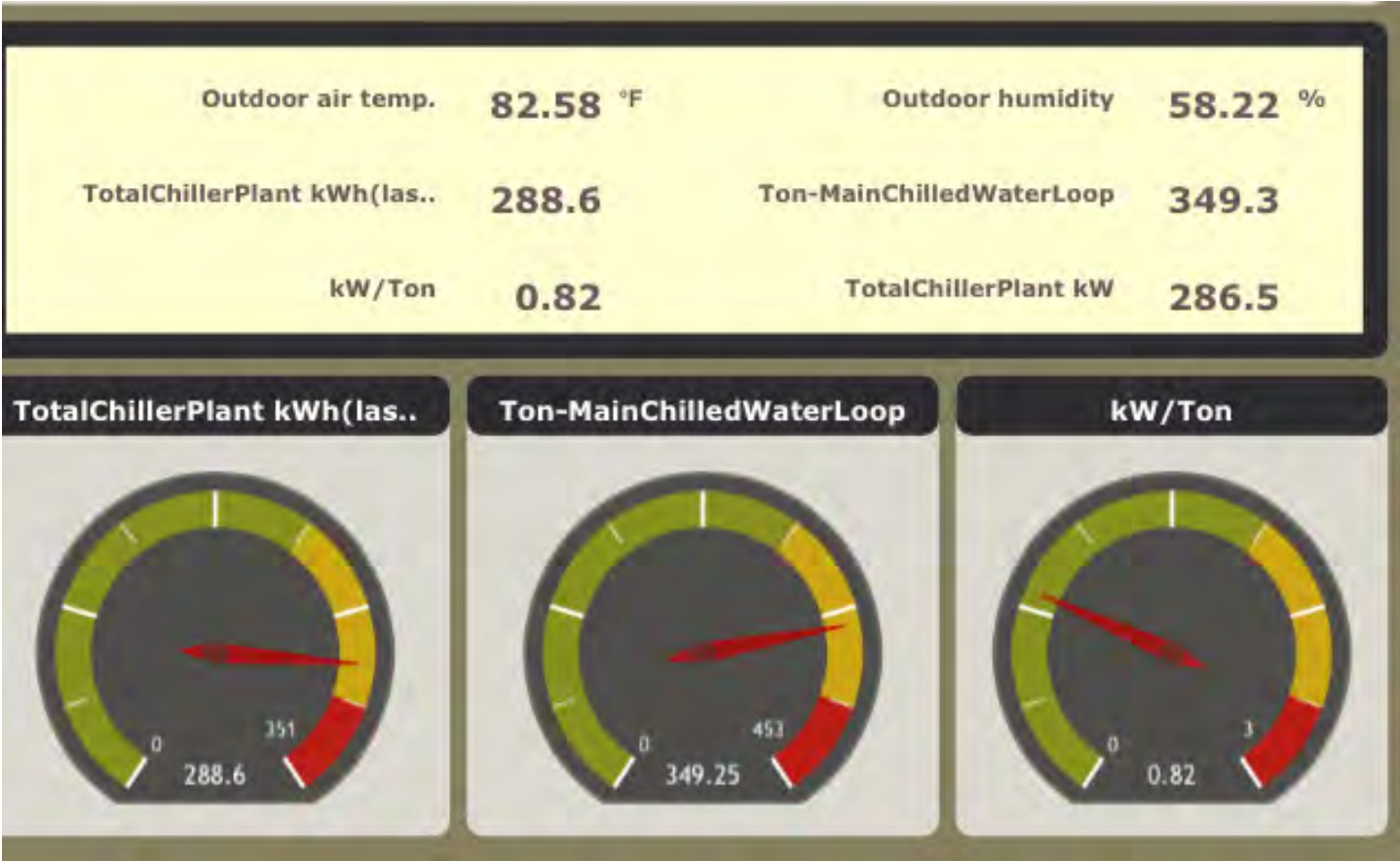
Chelsea Group brought the Hawaii Energy Central Plant Optimization program to 677 as a means to accomplish the central plant retrocommissioning project recommended in their *Sustainability Management Report* (SMR). The program included the installation of extensive submetering of electricity and both chilled and condenser water flow and temperature.

A monitoring system powered by an ns2u real time data collection and reporting system, offered by NSTech, was the solution for keeping it all straight. Real time monitoring enabled tracking of system level and component level performance in 5 second intervals (selectable to the microsecond). Every operational change could be visualized in the on-line reporting from the system.



The data pointed to two areas of specific opportunity for optimization. The cooling towers were operating at lower fan speeds to conserve fan energy. But real time data showed that by operating the fans at a higher speed and a therefore a lower condenser water temperature, the overall plant efficiency would improve and chiller operating energy savings would greatly exceed fan energy increases. The second opportunity came from implementing variable speed pumping on the chilled water distribution and optimizing that system based on flow data from the main branches.

THE DASHBOARD



THE BOTTOM LINE

Measured energy use for the chiller decreased by 19.2% and chilled water pumping energy decreased by 37.5% as a result of the project. For a period of about four months, the measured energy savings totaled about 76 thousand kWh, which translates to over 220 thousand kWh per year.

Financially, the project provides excellent rewards to ownership. The rebates from Hawaii Energy covered 85% of the project costs. The balance of the investment required had a simple payback of less than 5 months of documented savings.