

verdant



CASE STUDY

DoubleTree Westport
St. Louis, Missouri



Study Overview

Verdant eNviro iQ thermostats were installed at the DoubleTree Westport in St. Louis, MO. for the purpose of evaluating the performance of the Verdant eNviro iQ EMS (Energy Management System). In order to calculate the energy savings, an Energy Saving Report was created. As part of the study, a verification exercise was conducted by Johnson Controls (JCI), to measure the accuracy of the Verdant Energy Savings Report.

Energy Savings Report

Eighteen (18) pairs of rooms, thirty-six (36) rooms, were included in the Energy Savings Report. Eighteen (18) rooms had thermostat EMS features turned on, and the other eighteen (18) rooms had thermostat EMS features turned off. Pairs of rooms with all geographic orientations, and located on all floors of the hotel were included in the report.

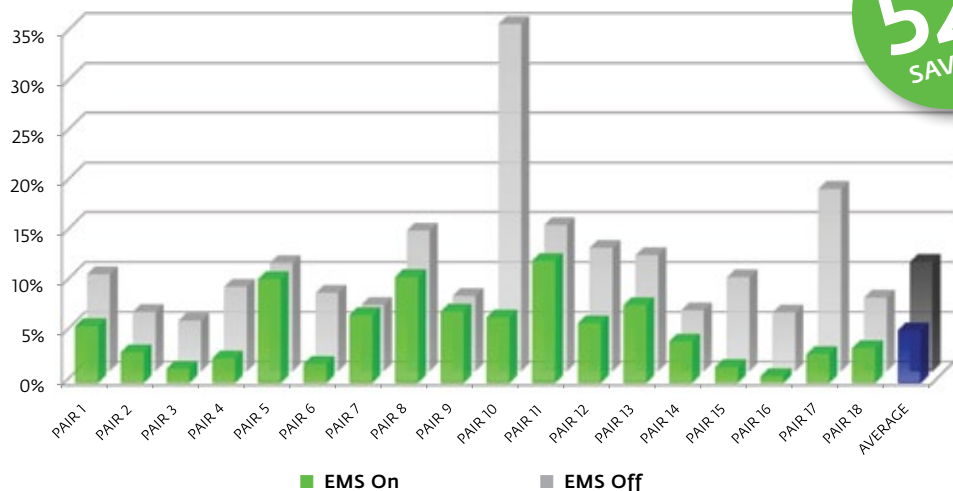
The rooms in each pair were chosen to be adjacent to each other, be the same size and be on the same floor, so that the external factors governing HVAC load on both rooms would be kept as similar as possible. In addition, all rooms in the report had identical HVAC equipment.

Data for the report was gathered for twenty seven (27) days (Feb. 8, 2010 - March 6, 2010), and the energy use in rooms with EMS turned on was compared to the energy use in rooms with EMS off.

The energy use counters in each pair of rooms were compared in an Energy Saving Report displayed on the Verdant remote management website. The energy saving report displayed the energy use of the HVAC units in the test, and displayed them graphically (reported unit run time / total elapsed report time). The savings for all the pairs were averaged to obtain an overall energy savings figure.

Report Results

During the report period, the HVAC equipment in eighteen (18) rooms with EMS turned on ran an average of 5.29% of the total time (or 35667 minutes) while the HVAC equipment in eighteen (18) rooms with EMS turned off ran an average of 10.95% of the total time (or 73809 minutes), for a saving of 51.7%.



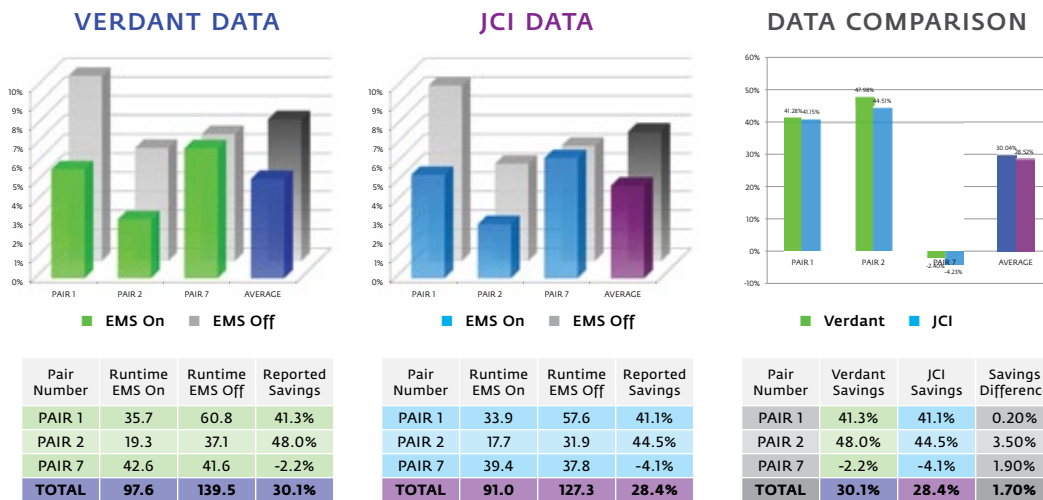
Johnson Controls Verification

During the study, Johnson Controls (JCI) performed a verification exercise that was designed to measure the accuracy of the Verdant Energy Savings Report. JCI installed data loggers on the HVAC units in a sample of rooms equipped with Verdant eNviro iQ thermostats. Data loggers recorded the actual run times of the HVAC units by measuring the current consumed by the HVAC system.

Data from three (3) pairs of rooms was used to verify the Verdant Energy Savings Report methodology.

JCI Verification Results

For three room pairs audited by JCI, Verdant reported a total of 139.5 hours of HVAC energy use from the rooms with EMS turned off, versus 97.6 hours for the rooms with EMS turned on, for a reported saving of 30.1%. JCI recorded 127.3 hours for the rooms with EMS turned off, and 91 hours for rooms with EMS turned on, for a savings of 28.4%.



All discrepancies between Verdant and JCI data were attributed to the HVAC unit duty cycle interrupts. Verdant report showed more usage than the JCI loggers for all rooms due to the HVAC unit built-in antifreeze protection that caused the units to interrupt cooling cycles. The Verdant report measured the time that the thermostats were requesting heating and cooling - including the cooling cycle interrupts, while the JCI loggers recorded the time that the HVAC units were running - not including the cooling cycle interrupts.

JCI concluded that the Verdant reported energy savings for the three (3) audited pairs of rooms were in agreement with JCI data thus validating Verdant reporting methodology.

"Verdant has reported a savings percentage of 30.1% compared to JCI's data on the same rooms and dates that show a savings percentage of 28.4%. It is therefore within the accuracy of our analysis to state that savings is very likely occurring anywhere from 25% to 30% ... and thus confirms the Verdant reporting methodology and savings for those rooms compared."

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