CIMETRICS | ANALYTIKA

CASE STUDY

Laboratory Cleanroom Facility achieves $1.1M in annual energy savings and 3,200 Mtons of Carbon Reduction utilizing Analytika.

The LCF is a 130,000 square foot state-of-the-art nanotechnology research facility that houses class-10, class-100, and class-1,000 cleanrooms, offices and classrooms.

OBJECTIVES

The main objectives of this Analytika program were to achieve energy cost reduction, reduce carbon emissions, improve efficiency, increase reliability, support compliance reporting, enhance preventative maintenance, prioritize O&M efforts, and improve comfort while maintaining environmental safety ventilation requirements.

SOLUTION

Analytika AFDD (Automated Fault Detection and Diagnostics) continuously analyzed over 4,500 BAS points from the facility's Air Handling Units, Chilled Water and Hot Water Pumps, Steam-to-Hot Water Heat Exchangers, terminal units, System Control Valves, Recirculating Air Handling Units, and Fan Coil Units. Experienced Cimetrics engineers leveraged Analytika to identify opportunities, determine root cause, and calculate annual savings impact. Actionable recommendations were documented and provided via the online Analytika Portal.

Analytika utilized over 2500+ algorithms to analyze operational data 24/7/365

Analytika identified energy savings opportunities

Analytika calculated energy savings and tracked and verified savings.

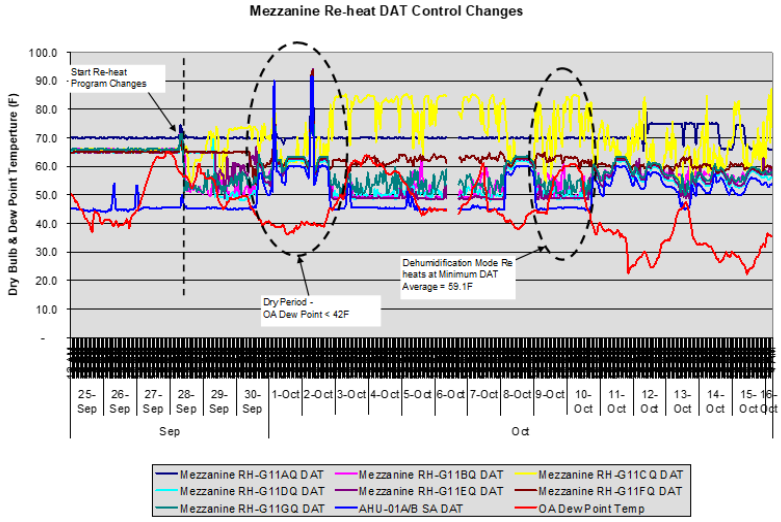
The Analytika team worked closely with the client team to implement, track and verify the changes, improvements and savings.

RESULTS

- $1 MILLION — Realized $1,093,448 Dollars in Energy Savings
- CO_2 — Saved 3,200 Metric Trons of CO2
- 24 energy-savings issues identified
- 516 issues identified total
- 1,407,258 kWh saved
- 20,015 MMBTU of steam saved
- 15,443 MMBTU of Chilled Water saved
- 8% — Central Plant Load Capacity Improvement

SIMULTANEOUS HEATING AND COOLING

A group of clean rooms require precise temperature and relative humidity control. The clean room zone temperatures are maintained at 68F by zone air handlers with cooling coils. Outdoor air is provided by a larger AHU that cools the air to 45F for dehumidification. Reheat coils reheat the air before it is mixed with the clean room return air and sent to terminal fan coil units. Prior to Analytika, the reheat coils discharged constant 70F, even though the zone FCU's were cooling to 65F to maintain the zone temperature setpoint. This resulted in excess energy use as the air was overheated and then cooled again. Analytika identified the opportunity and recommended to reset the AHU supply air temperature during periods when the outdoor air is dry and dehumidification is not required, and that the reheat coils be controlled based off of the heating and cooling demand of the clean rooms. The controls sequences were revised and simultaneous heating and cooling was reduced, saving **$180,601** in energy annually.



HEAT RECOVERY

AHU-1 and AHU-2 often had preheat coil discharge air temperature setpoints that were lower than the chilled water supply temperature, which meant that the air passing over the chilled water cooling coils was often colder than the chilled water in the loop. Analytika identified the opportunity to use cold outdoor air to provide free cooling to the chilled water system, reducing chiller energy use. Analytika recommended reducing preheat coil discharge air temperature setpoints to as low as possible without freezing the coils (38F), and opening the chilled water valves whenever the outdoor air temperature is below the chilled water supply temperature. The controls change was implemented and resulted in an annual energy savings of **$102,374.**