



SkySpark

Find What Matters™

Case Study

**Banner Health:
Reversing the Trend of
Energy Drift**

June 27, 2016

SkyFoundry

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Banner Health: Improve Energy Management to Maintain Energy Savings and Reverse the Trend of Energy Drift for Facilities

Overview

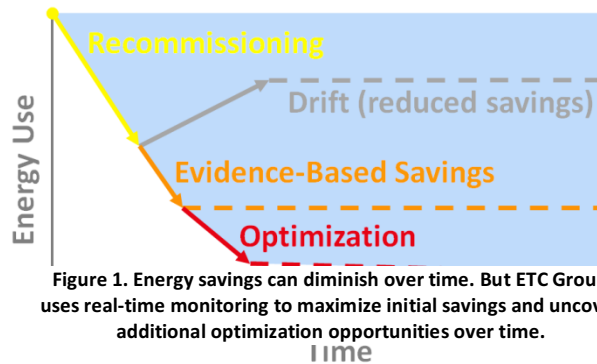
Annual Savings

\$449,000	4,770,000 kwh	13,600 dtherms	194% IRR
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Banner Health has developed a strong energy-management group and has recently completed several energy-efficiency projects at its facilities. With continued attention to utility data, Banner has observed that facility energy use tends to drift upwards over time. Energy project savings and performance gains are susceptible to this drift and Banner has seen these gains begin to disappear shortly after projects are completed.

Banner wanted to identify ways to improve energy management in order to maintain energy savings for completed projects and reverse the trend of energy drift for facilities in general.

In 2014-2015, Banner partnered with ETC Group to implement a flagship monitoring-based commissioning approach to achieve these goals with a project at the Thunderbird campus.



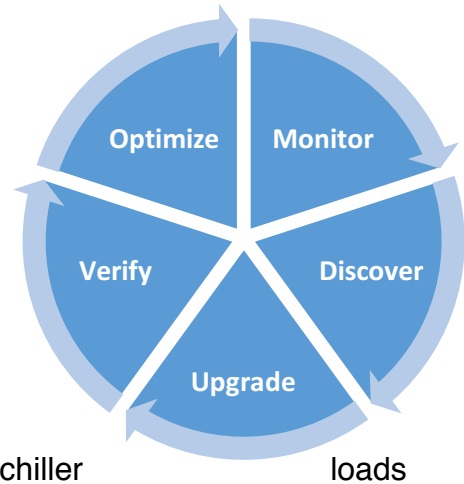
Case Study: Banner Thunderbird

Solution: ETC Group's Energy Performance Platform

Banner contracted ETC Group to: monitor facility performance, identify evidence-based savings opportunities, implement upgrades, verify the performance of the upgrades, and continue to optimize performance over time.

Monitor

ETC Group deployed a custom-developed energy analysis and fault detection platform using SkyFoundry's SkySpark[®] Analytics Software and connected hundreds of devices with thousands of data points. The software collects live, 15-minute data on everything from room temperatures and fan speeds to chiller and power meter readings.



Discover

ETC Group engineers conducted a comprehensive review and employed sophisticated automatic-issue-detection algorithms to identify a live list of energy efficiency opportunities. A team of ETC engineers then visited the Thunderbird campus to conduct field tests and validate findings.

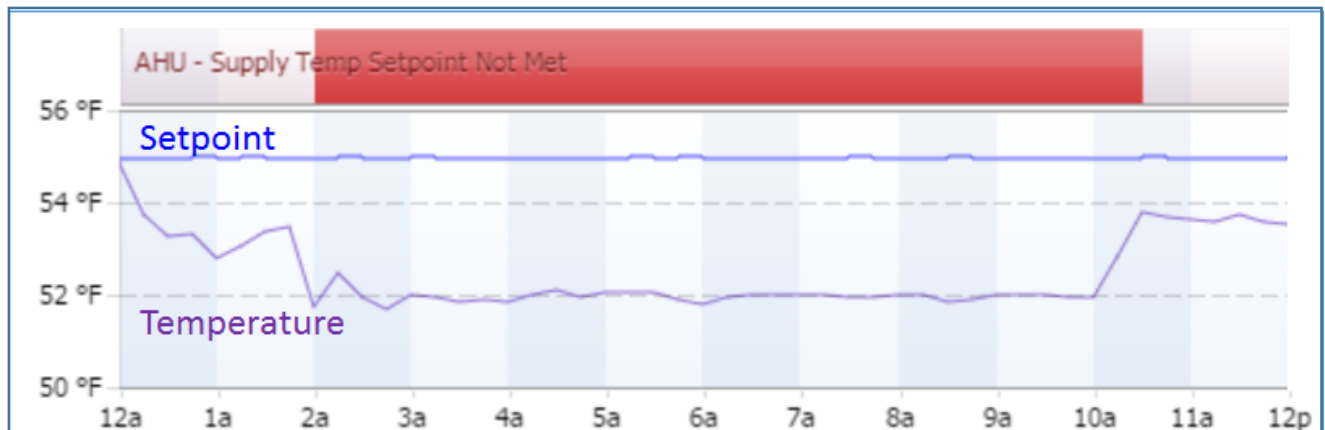


Figure 2. Automatic Fault Detection (in red above) reveals when a piece of equipment cannot meet its temperature setpoint. This fault indicates the potential to save energy by reducing unnecessary cooling.

Upgrade and Verify

Case Study: Banner Thunderbird

ETC Group partnered with local control programming specialist Climatec to implement upgrades, starting in June 2015. These included:

- Utilizing scheduling or occupancy sensors to control ventilation levels according to space occupancy
- Optimizing controls algorithms / programming in the central plant
- Reprogramming 40 air handlers to efficiently utilize economizers and optimally reset supply air temperatures and pressures.

Once these energy efficiency upgrades were installed, Banner could see the results in both operational improvements and immediate reduction in utility usage: saving

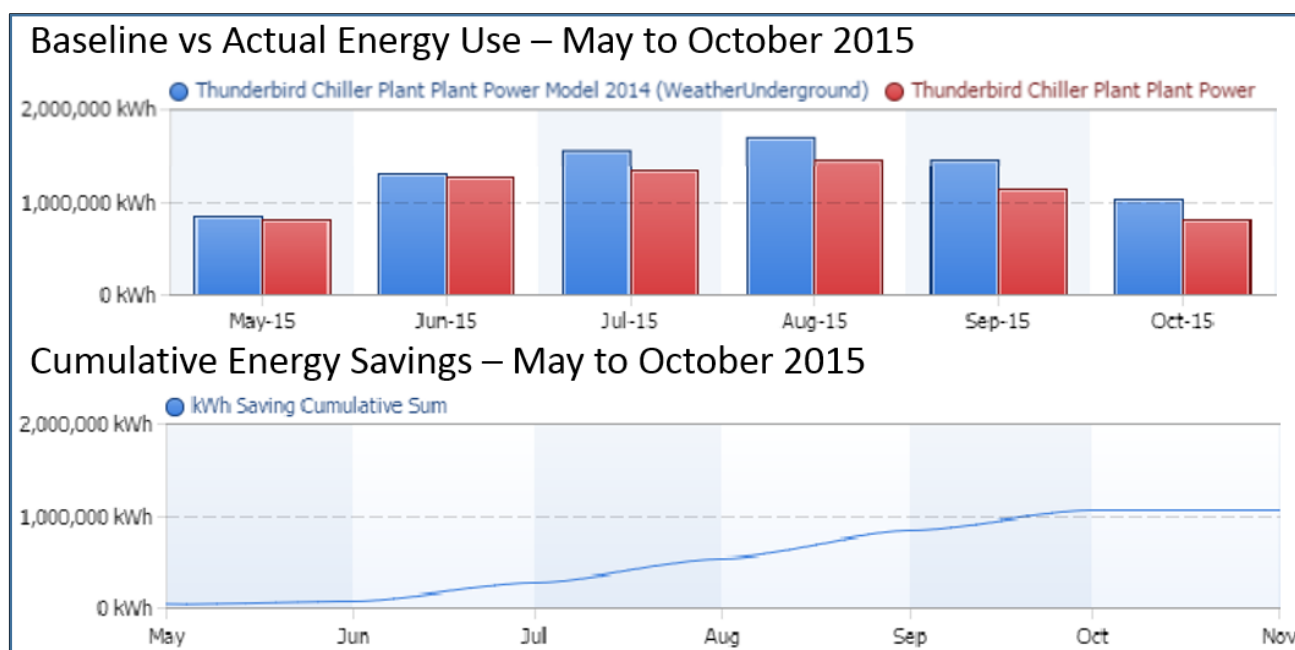


Figure 3. Chiller plant uses less power as efficiency measures are installed. Actual power consumption (red bar) consistently falls below baseline (blue bar), starting in June. The baseline is based on a linear regression model that uses outside air temperature

Optimize

ETC Group provides ongoing consulting assistance for the Thunderbird campus, including monthly and weekly reports that show overall energy performance indicators along with comparisons to historical information. Fault detection rules scan for any backsliding on previous energy investments as well as proactively identifying new savings and performance opportunities.

Financing

Case Study: Banner Thunderbird

Banner assigned the utility rebate to ETC Group. This win-win strategy reduced the upfront project cost to Banner and incentivized ETC Group to maximize and prove energy savings.

Additional Information

This case study was compiled by ETC Group with help from SkyFoundry and Climatec. If you have any questions or would like additional case studies, please use the contact information below.

www.etcgrp.com

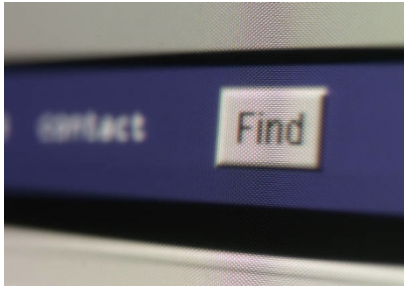


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SkySpark® Analytics Software - For the World of Smart Devices



The past decade has seen dramatic advances in automation systems and smart devices. From IP connected systems using a variety of standard protocols, to support for web services, it is now possible to get the data produced by the wide range of devices found in today's smart devices and equipment systems.

Access to this data opens up new opportunities for the creation of value-added services to help businesses reduce energy consumption and operational costs and to identify opportunities to enhance operations through improved control, and replacement or repair of capital equipment.

Access to the data is just the first step in that journey, however. The new challenge is how to manage and derive value from the exploding amount of data available from these smart and connected devices. SkyFoundry's SkySpark® Analytics Software directly addresses this challenge.

The new frontier is to efficiently manage and analyze data to *Find What Matters™*.



About SkyFoundry

SkyFoundry's mission is to provide software solutions for the age of the "Internet of Things".

Areas of focus include:

Building automation and facility management

Energy management, utility data analytics

Remote device and equipment monitoring

Asset management

SkyFoundry products help customers derive value from their investments in smart systems.

Learn more at: www.skyfoundry.com

Contact us at: info@skyfoundry.com

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