



Building Efficiency Case Study:

Pinnacol Assurance

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Pinnacol Assurance's headquarters building was built in 2002 as part of an office and commercial park on the former site of Lowry Air Force Base. Despite its modern design and materials, consistently high energy bills prompted the building management team to reevaluate their energy efficiency strategies. In 2013, the building's energy usage was benchmarked using the ENERGY STAR Portfolio Manager tool, and a full energy audit found many opportunities to save energy on low cost projects with attractive payback times. In less than two years, the building's ENERGY STAR score improved from 54 to 74, with a projected improvement to 89 once the retro commissioning and data center improvements are made. The building's owners saw monthly reductions in energy bills with an average return on investment of 3 years.



Tracking Performance

In recent years, the business case for investing in energy efficiency in buildings has gained acceptance. High energy bills and an understanding of the connections between energy usage and financial savings prompted Pinnacol's management to focus on improving their buildings energy efficiency.

In 2013, a new facilities manager with expertise in energy efficiency and sustainability oversaw efforts to measure and audit the building's energy related systems. As a first step, past energy bills and building information were entered into ENERGY STAR Portfolio Manager, a powerful, free, web based tool that compares the energy performance of buildings with others of similar type. When first benchmarked, the building had an ENERGY STAR score of 54 out of 100 during 2012, meaning that it was performing slightly above the average of similar buildings across the country.

Upgrade	Savings	Cost	Estimated Payback
HVAC Adjustments	Saving an estimated 126,500 kWh monthly	\$2700	3 months
Indoor Lighting System Adjustments, Occupancy Sensors, and LED Bulbs	Saving an estimated 70,125 kWh monthly	\$21,600	3.5 years
Retro commissioning	Saving an estimated 759,000 kWh monthly	\$96,000	1.5 years
Parking Garage LED Bulbs	Saving an estimated 2,000 kWh monthly	\$9294	3 years
Parking Lot LED Bulbs	Saving an estimated 30,300 kWh monthly	\$11,289	4 years
UPS and Data Center (estimate)	n/a	\$350,000	4 years

This score confirmed that the building had room for improvement, prompting a full energy audit. The Boards of Directors of organizations like Pinnacol Assurance have a fiduciary duty to invest only in capital improvements with a reasonable Return on Investment (ROI). Keeping this in mind, facilities management was able to audit the building systems, and estimate the ROI of each type of energy efficiency upgrade.

Pursuing Cost Effective Energy Efficiency

The most cost effective energy efficiency strategies are usually operational, and are generally pursued before investing in equipment upgrades or new building systems. Adjusting the air flow, temperature set points, and scheduling of the heating, cooling, and ventilation systems only required labor, and paid for itself within 3 months of the changes.

Next, the board approved a complete update to indoor and outdoor lighting. This included LED light bulbs to replace fluorescent and incandescent bulbs as they burned out, occupancy sensors at workstations, and adjustments to the weekly lighting schedule. This project is estimated to payback in 3.5 years, and saved \$500 monthly in reduced energy bills.

As management continued to see costs savings from reduced energy bills, they gained increased confidence in these methods, and were willing to invest in further upgrades. Commissioning is the process of methodically checking the proper functioning of new buildings systems to ensure proper performance before occupancy. The Pinnacol building was never commissioned before occupancy. A retro commissioning recalibrates and tunes up every component of a building's systems. Retro commissioning of the building has been the most costly energy efficiency measure yet, but is projected to payback in less than 1.5 years.

"As an organization serving over 1 million Colorado workers, we have to be socially conscious. We have to think bigger than our own business in terms of the impact we have on one another. We are all interconnected.

-Paul Doughty – Facilities Manager

Next Steps

The success of these programs has only encouraged management to continue this work. Proposed projects include renovations to the data center, which currently has oversized equipment and an intensive energy footprint. Resizing the data center rooms, installing a smaller Uninterruptible Power Supply device, and appropriately sizing the heating and cooling exchangers will be costly, but are projected save the most energy of any upgrade so far. Pinnacol is also considering buying into the community solar project located on the roof of one of the former hanger buildings of Lowry AFB.

The case of Pinnacol Assurance highlights the process that a financially responsible organization should go through in pursuing and achieving energy efficiency. Care was taken to benchmark and audit the building before investing in capital improvements, and when the business case for these improvements was clear, improvements were prioritized according to their cost effectiveness. As these upgrades proved themselves in actual energy savings, the fiscally responsible board was prompted to invest in more impactful energy efficiency projects. Other office buildings of this size can learn from this example, and follow in their example to become leaders in financial and environmental sustainability.