



BUILDING EFFICIENCY CASE STUDY:

# THE BROWN PALACE

## HOTEL & SPA

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### Maintaining a legacy

The Brown Palace is distinctive in its rich history; built in 1892 it was the first hotel in Denver and the second in Colorado. Given the age of the building, energy efficiency is one of the greatest challenges the hotel has had. The hotel has focused on energy efficiency over the last 120+ years with varying levels of priority. Since 2012 the hotel has truly increased its focus on energy efficiency for both kWh and therms. With a legacy to continue, the hotel has also started to plan for future projects such as full scale lighting retrofits, continued HVAC upgrades, and elevator modernization.

### Tracking performance over time

Major projects all start with projected energy savings and an estimated ROI (return on investment). The Brown Palace tracks energy consumption and reduction for both electricity and natural gas monthly based on utility invoices. They are tracked in four ways: Energy Star Portfolio Manager, Green Hotel's Global (a hospitality initiative), internal sustainability committee tracking worksheet, and through an occupancy normalized baseline.

Energy and water usage in a hotel is greatly dependent on occupancy; as is every measure of hotel performance and consumption.



The higher the occupancy, the greater the utility usage and demand, the lower the occupancy the lower the usage. Unlike an office building where occupancy is fairly consistent - occupancy in a hotel changes daily, weekly, monthly and yearly. Over the past two years occupancy at the Brown Palace has increased 19% (2012 v 2014 year to date) yet the electricity consumption has decreased 26% and natural gas usage has decreased 24% per occupied room. In other words with a 19% increase in demand our consumption had decreased over 20%.

UPGRADE	SAVINGS	ESTIMATED ROI	ESTIMATED PAYBACK
<b>Housekeeping and staff behavior change, rolling lighting retrofit, partial completion of other upgrades listed here.</b>	Electricity consumption has decreased 26% and natural gas usage has decreased 24% per occupied room in the past 2 years.	n/a	n/a
<b>Lighting Retrofit Guest Rooms - 2015</b>	Saving an estimated 250,000 kWh annually.	167%	7 months
<b>Lighting Retrofit Meeting Rooms - 2015</b>	Saving an estimated 148,000 kWh annually.	111%	11 months
<b>HVAC Upgrade – 2015/16 completion</b>	Saving an estimated 149,026.36 kWh and 61,043.45 gallons of water annually.	n/a	n/a
<b>Façade Refurbishing – 2016 completion</b>	n/a	n/a	n/a
<b>Laundry – 2015 trial of new system</b>	Estimated 54% energy savings	209%	5.5 months

## Pursuing energy efficiency improvements that make sense

The hotel's approach to energy efficiency varies with technology advancements, existing equipment performance and prioritizing needs of the hotel. Over the past two years a very passionate Sustainability Committee has also brought energy conversation into the spotlight. Being a historical building, efficiency measures and management practices are prioritized with projects for the greatest impact. As the building ages certain parts need more attention than others, and projects that are on the long term horizon have to be moved up based on necessity.

Originally planned as a future upgrade, the hotel received many guest requests for heating or cooling adjustments in their rooms. These needs helped

**"The Brown Palace is a historical building built in 1892 and energy efficiency is one of our greatest challenges, which in turn means it is one of our greatest opportunities.**

Any energy conservation measure we can take is good for our guests, our associates and our bottom line," said Brenna St. Onge, Chair of Sustainability

prioritize an HVAC upgrade that not only had energy efficiencies, but helped make guests more comfortable. The upgraded system has a state of the art wireless automation system so guests can set room temperatures

based on their comfort and it can be centrally controlled by maintenance. In addition, the HVAC units are monitored on a regular basis by the engineering team. The housekeeping staff also plays a role in setting the room temperatures to seasonal set points and closing blinds in the summer to help regulate hotel wide temperatures.

One of the largest contributors to their energy savings over the past two years is a three year façade refurbishing. The sandstone on the building is the original stone since 1892 and has seen much wear and tear over the years. The façade project takes on one side of the building each year and is literally sealing the holes in the building- making the 'envelope' of the Brown Palace more efficient as a general structure. While the project is still in process, they have already begun to see energy efficiencies as a result of one and ½ sides completed.

The hotel is in the process of phasing out incandescent lights to LEDs, often considered "low hanging fruit." Light bulbs are replaced as they burn out, and a full scale lighting retrofit is in the works for 2015. In addition, their IT team sets computers on sleep mode after 15 minutes of inactivity, and all computer work stations are

equipped with signs that say "Turn me off when not in use! By turning me off overnight you save enough energy to cook 8 full dinners". Associates are asked to turn off lights that are not in use at work stations and storage closets. Establishing a culture of energy conservation is crucial to drive results especially in a historic building.

Each of the projects either in the works or completed were wise business decisions because they addressed three important factors: guest satisfaction, energy usage and long term cost savings through increased efficiencies.

## Future upgrades in the works

In November and December of 2014 a new laundry system (Ecolab) in the hotel will undergo a trial run for switching permanently to the new Aquanomics line. The Aquanomics technology has significant water and energy savings through innovative changes to the wash cycles, while still promising quality and sanitation. Ecolab's new system has a projected energy savings of 54% for the entire washing equipment. The hotel processes an average of 150,000 pounds of linen each month and a 54% energy reduction for this process is significant.

The lighting retrofit will be done in phases focusing on guest rooms first, then moving on to meeting rooms and finishing with public areas. Huge energy savings are forecasted and will greatly improve the energy efficiency of the majestic building. Finally, the three year HVAC upgrade is still underway and will conclude sometime in late 2015 or early 2016.

The Brown Palace has only begun to tap into the energy efficiency potential it has. There are many wonderful opportunities property-wide that are being assessed now to determine the next best project with the greatest possible impact.

