SUSTAINABLE SAVINGS:

A GUIDE TO HOTEL ENERGY & WATER MANAGEMENT

AHLA
AMERICAN HOTEL & LODGING ASSOCIATION



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Commissioned by the AHLA Sustainability Committee and produced by Amy Bourne, Independent Sustainability Consultant.
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DISCLAIMER: This guide was prepared in compliance with AHLA's Antitrust and Statistical Reporting policies. As part of its Responsible Stay initiative, AHLA provides this resource in support of the hotel industry's efforts to reduce carbon emissions through energy efficiency, waste reduction, water conservation, and responsible sourcing. Each business should determine the strategies, tools, vendors, or investments that best suits its needs. Actual costs, savings, and outcomes will vary depending on site conditions and technology choices. Case studies include self-reported data by hotels and have not been independently verified by AHLA.

INTRODUCTION

The Sustainable Savings Guide (guide) was commissioned by the American Hotel & Lodging Association (AHLA) Sustainability Committee (comprised of industry brands, owners, operators, and experts in sustainability and produced in alignment with the AHLA Responsible Stay Initiative.

The guide is designed to be a starting point to help existing hotel teams build awareness of and implement energy and water management practices, with the overall objective of driving utility cost savings and reducing environmental impacts through conservation and reduction in use. It can assist properties at varying levels of sustainable operations, from those who have not taken any action to those that are much further along.

Note: For purposes of this initial resource, designation between chain scale/property type is not included. Leadership will need to identify appropriate actions for their hotel and apply the guide accordingly.



The guide is designed with **four key considerations:**

COST SAVINGS

Energy and water management practices offer the potential for significant cost savings and an overall positive effect on a hotel's bottom line. These practices can be instituted via daily behavioral changes and/or through low and higher-cost investment strategies.

Did You Know?

Utilities are often the **second highest cost** for hotels after labor costs. (Lodging Magazine)

REGULATORY COMPLIANCE

The regulatory landscape is continually changing, which poses significant challenges across markets. Actively managing energy and water can help companies/hotels meet current and future regulations and avoid potential fines.

Did You Know?

There are **hundreds of active state and local policies** across the United States regulating energy and water use/efficiency.

ENGAGEMENT AND EXPERIENCE

Customer demand for energy and water reduction is a component of the overall value proposition for driving the implementation of sustainable practices in hotels. Proper execution of energy and water management practices can result in revenue generation and positive brand reputation.

Did You Know?

60% of guests prefer hotels committed to sustainability. (2024 Morning Consult Poll)



NEED FOR ADDITIONAL RESOURCES

Every hotel will approach energy and water management differently based on the specific characteristics of the building and available resources. The guide provides a framework for starting energy and water management efforts; however, hotels will need to consult other technical and cost guidance, third-party vendors, and other resources to fully execute on all the suggestions in the guide.

Note: Many sections of the guide are applicable to new construction hotels. Reference the "American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) Advanced Energy Guides and other resources for more specific guidance on designing new hotels.

HOW TO GET STARTED

The guide is designed for the following audiences. These stakeholders play a significant role in ensuring that energy and water management practices are integrated into daily operations, and short and long-term investment strategies.

- **General Managers**
- **Operational Teams** (Housekeeping, Culinary/Food & Beverage, Engineering, Spa/Fitness)
- **Owners**

The guide starts with **4 steps** that hotels should take before embarking on specific energy and water management practices:



STEP 1: REVIEW STATE/LOCAL ENERGY AND WATER POLICIES



STEP 2: UNDERSTAND UTILITY BILLS AND TRACK ENERGY AND WATER USE DATA



STEP 3: BENCHMARK ENERGY AND WATER DATA



STEP 4: CONDUCT ENERGY AND WATER AUDITS

If hotels cannot complete any of the initial four steps, energy and water management practices can still be implemented. Be aware of the impacts of this missing information and be prepared to communicate them to leadership and operational teams. Once the four steps are complete, hotels can use the guide to assist with identifying energy and water management practices across three phases:

PHASE 1: NO-COST OPERATIONAL PRACTICES

PHASE 2: LOW-COST QUICK WIN INVESTMENTS

PHASE 3: HIGHER-COST CAPITAL EXPENDITURE INVESTMENTS

Note: Throughout each phase of the guide, "Hotel Spotlights" showcase real-world projects. Case study examples were voluntarily shared by participating properties to illustrate real-world approaches to energy and water efficiency. The information has been generalized and aggregated for educational use.

STEP 1: REVIEW STATE/LOCAL ENERGY AND WATER POLICIES



Before implementing any energy or water management practices, hotels should review the official websites of their municipality, county and state and/or contact the local building or planning department, county environmental department and state energy and water agencies to identify any current or upcoming policies and requirements.

Examples of requirements include:

- **Building Performance Standards (BPS) for Energy and Water**
- **Energy Audits**
- **Energy Benchmarking**
- **Energy Reduction**
- **Greenhouse Gas Emissions Caps**
- **Retro-commissioning/Recommissioning**
- **Retrofitting**
- **Water Reduction**

Helpful Tip

Check the DSIRE Database, Incentifind, ACEEE, Energy Star Rebate Finder and Utility Genius (or directly contact the hotel's utility company) for comprehensive lists of local, state and federal policies and incentives. Private, fee-based databases are also available for hotels to track specific energy and water policies relevant to their operations.

STEP 2: UNDERSTAND UTILITY BILLS AND TRACK ENERGY AND WATER USE DATA



Utility bills can be challenging to understand and leverage to make important decisions about energy and water management. It is crucial for hotels to be able to decipher normal versus anomalous data based on occupancy levels and weather. The ability to identify trends and potential usage and/or billing errors will help ensure a property is adequately managing its energy and water data and avoiding unnecessary costs.

Helpful Tip

Check utility data as regularly as possible. Review charges monthly/as soon as the bill is received. Analyze usage trends more in-depth at least quarterly to ensure there are no discrepancies to investigate.

Most utilities provide detailed explanations regarding how to read and understand utility bills. The presentation of utility bills varies by company, including the units used to measure energy and water. Review the sample bills below. Contact the hotel's utility company with specific questions.

- **Electric and Gas Bill**
- **Sample Water Bill**

Energy and water use data from utility bills can be tracked manually; however, this can be time consuming, prone to human error and does not allow for comprehensive analytics and future benchmarking. Instead, energy and water data can be tracked for free using Energy Star Portfolio Manager. Other advanced platforms offer a variety of services, including AI capabilities such as collecting and analyzing data, reporting data, identifying errors and automatic bill pay.

Free tools such as ChatGPT and Google Sheets with AI add-ons can help with assessment and interpretation of utility bills, including identifying anomalous data, if prompts are structured correctly.

Did You Know?

Energy Star Portfolio Manager **is a free online tool** developed by the U.S. Environmental Protection Agency (EPA) that helps users **track, manage and benchmark energy and water** use across their building portfolios.

DEMAND RESPONSE

Utility companies offer demand response programs to incentivize customers to reduce or shift electricity usage in the service area during peak times. In return, customers may receive financial incentives by lowering their overall electricity bill and receiving additional payments.

Helpful Tip

Not every utility offers a demand response program. Larger utilities in regions with high electricity demand or strong clean energy policies are more likely to have them, while smaller municipal and cooperative utilities may not. Check with the hotel's utility company to determine if a program is available.

ENERGY MARKETS

Hotels operate in different types of energy markets depending on their location. In regulated markets, a single utility company controls the generation, transmission, and delivery of electricity and natural gas. In contrast, deregulated markets allow businesses to shop among multiple energy providers. If a property is in a deregulated market, provider options should be compared to find the best rates and renewable energy plans.

Helpful Tip

Learn more about energy markets and determine what type of market your hotel is located in from EPA.



STEP 3: BENCHMARK ENERGY AND WATER DATA

Benchmarking is the process of comparing a building's energy and water use to that of similar buildings or established industry standards to assess its relative performance.

Helpful Tip

In addition to tracking usage data, cost data should be tracked to ensure the financial impacts of potential future energy/water reduction projects are understood.

DOES THE HOTEL TRACK ENERGY AND WATER DATA?

NO

Register the property with Energy Star Portfolio Manager (ESPM) or other internal database/process to begin uploading data.

YES

Has the hotel's energy data been benchmarked?

YES

Has the hotel's water data been benchmarked?

YES

Does the Engineering team, GM or other team members review energy data on a consistent basis as regularly as possible (e.g. weekly, monthly or quarterly)?

NO

- If using ESPM, upload all required energy data.*
- If not using ESPM, calculate EUI, total energy use and carbon footprint.**

YES

Does the Engineering team, GM or other team members review water data on a consistent basis as regularly as possible (e.g. weekly, monthly or quarterly)?

NO

- If using ESPM, upload all required water data.*
- If not using ESPM, calculate WUI and total water use.**

YES

Has the company/hotel set goals to reduce energy usage?

YES

Is the company/hotel planning to reset current goals after the expiration date?

YES

Has the company/hotel set goals to reduce water usage?

NO

Consider setting at least one energy reduction goal to start ESPM contains a framework to establish energy reduction goals and targets.

YES

Consider the progress against and impact of the previous set of goals and adjust accordingly. Beware of potential claims of greenwashing, especially if the original goals were not met.

NO

Consider the impacts of not extending or strengthening goals, including weakening customer and investor confidence.

NO

Consider setting at least one water reduction goal to start. ESPM contains a framework to establish water reduction goals and targets.

Helpful Tip

Reference Portfolio Manager 101 FAQs and U.S. Property Types, Definitions, and Use Details to ensure space types and energy/water use are accurately reported in ESPM.

Tracking and reporting energy and water data is an ongoing effort. Continuous management will help to ensure these resources are not being wasted and properties are not missing opportunities to be more efficient and experience cost savings.

*Upload energy data (12 months) and/or all available water data (include 2 to 3 years of previous energy and/or water data if available) into ESPM to generate energy use intensity (EUI), water use intensity (WUI), total energy and/or water use, and carbon footprint. If not using ESPM, calculate these values manually and compare with peers using the Greenview Hotel Footprinting Tool or EPA's utility benchmarking data.

**Reference the World Sustainable Hospitality Alliance's Hotel Carbon Measurement Initiative (HCMI) and Hotel Water Measurement Initiative (HWMI) methodologies to assist with calculating the property's carbon footprint from building emissions and water footprint. EUI, WUI and total energy and water use can be calculated from utility bill data and building floor area.

STEP 4: CONDUCT ENERGY AND WATER AUDITS

Energy and water audits are intended to identify energy and water reduction opportunities. Audits can be available at no or low cost from utility companies, non-profit organizations, and energy consulting firms.

Helpful Tip

Visit the DSIRE Database, Incentifind, ACEEE, Energy Star Rebate Finder and Utility Genius (or directly contact the hotel's utility company) for potential audit incentives.

The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) is a global professional organization that develops widely used standards and guidelines for building energy efficiency, HVAC systems, and indoor air quality.

Helpful Tip

If energy and water audits cannot be completed, hotels can conduct quick assessments to receive high-level recommendations.

Energy: DOE Building Energy Asset Score and EPA Treasure Hunt Guide

Water: EPA H2Otel Challenge

ENERGY AUDITS

ASHRAE Level 1 - Walk-Through Audit
General Scope: Basic visual inspection + utility bill review

ASHRAE Level 2 - Energy Survey and Analysis
General Scope: More detailed data collection and energy analysis

ASHRAE Level 3 - Investment-Grade Audit (IGA)
General Scope: In-depth engineering and financial analysis

Did You Know?

ASHRAE audits primarily **focus on energy** but the audit methodology allows for **water-related opportunities** where they affect building performance or utility costs. Auditors may flag water-saving opportunities under broader resource efficiency strategies. **The average cost range of a Level 2 ASHRAE audit is $0.10 to $0.50 per square foot.** (industry estimates)

An ASHRAE Level 2 audit will provide a list of energy conservation measures, including estimated energy savings, cost of implementation and simple payback period. This information will provide the most helpful guidance for the property to determine what energy management investments make the most financial sense.

WATER AUDITS:

Basic Water Use Assessment
General Scope: Review of utility bills and fixture inventory

Comprehensive Water Audit
General Scope: Flow monitoring, sub-metering, and system mapping

Process or Site-Specific Water Audit
General Scope: Focus on specific systems (e.g., cooling tower, kitchen, laundry)

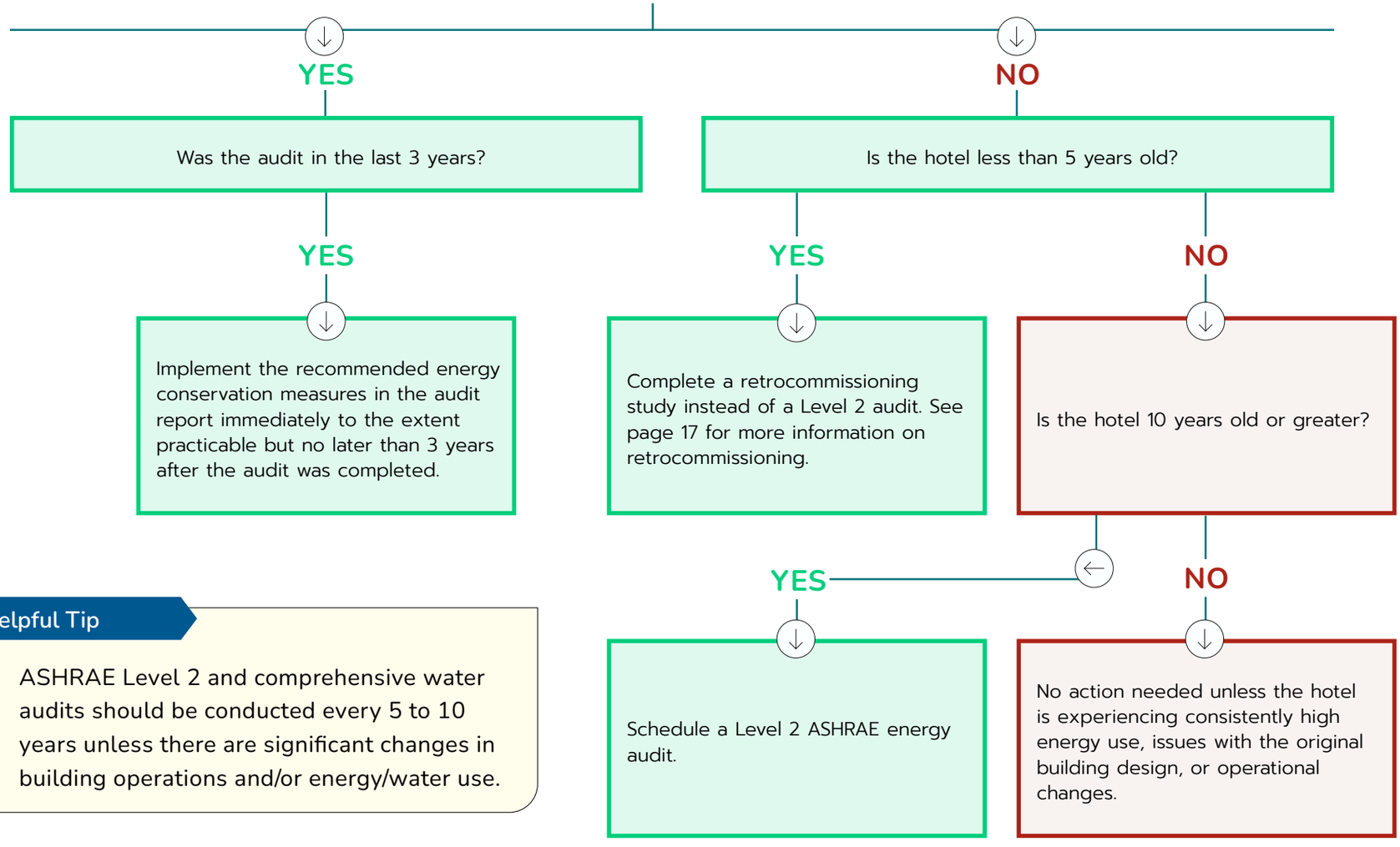
A comprehensive water audit will provide a list of water conservation measures, including estimated water savings, cost of implementation and simple payback period. This information will provide the most helpful guidance for the hotel to determine what water management investments make the most financial sense.

Helpful Tip

The results of energy and water audits **must be assessed against utility costs, penalties associated with Building Performance Standards, and local and state incentives** to inform decision making.



HAS THE HOTEL HAD A LEVEL 2 ASHRAE ENERGY AUDIT CONDUCTED?*



Helpful Tip

ASHRAE Level 2 and comprehensive water audits should be conducted every 5 to 10 years unless there are significant changes in building operations and/or energy/water use.

Note: If an ASHRAE Level 2 or similar energy or water audit is conducted, ensure that budget is allocated to implement the resulting recommendations. The true value of an audit comes from acting on its findings, not simply identifying them. As a rule of thumb, hotels should plan to invest a minimum of $50,000-$100,000 (likely more for many hotels) to implement at least a portion of the identified recommendations.

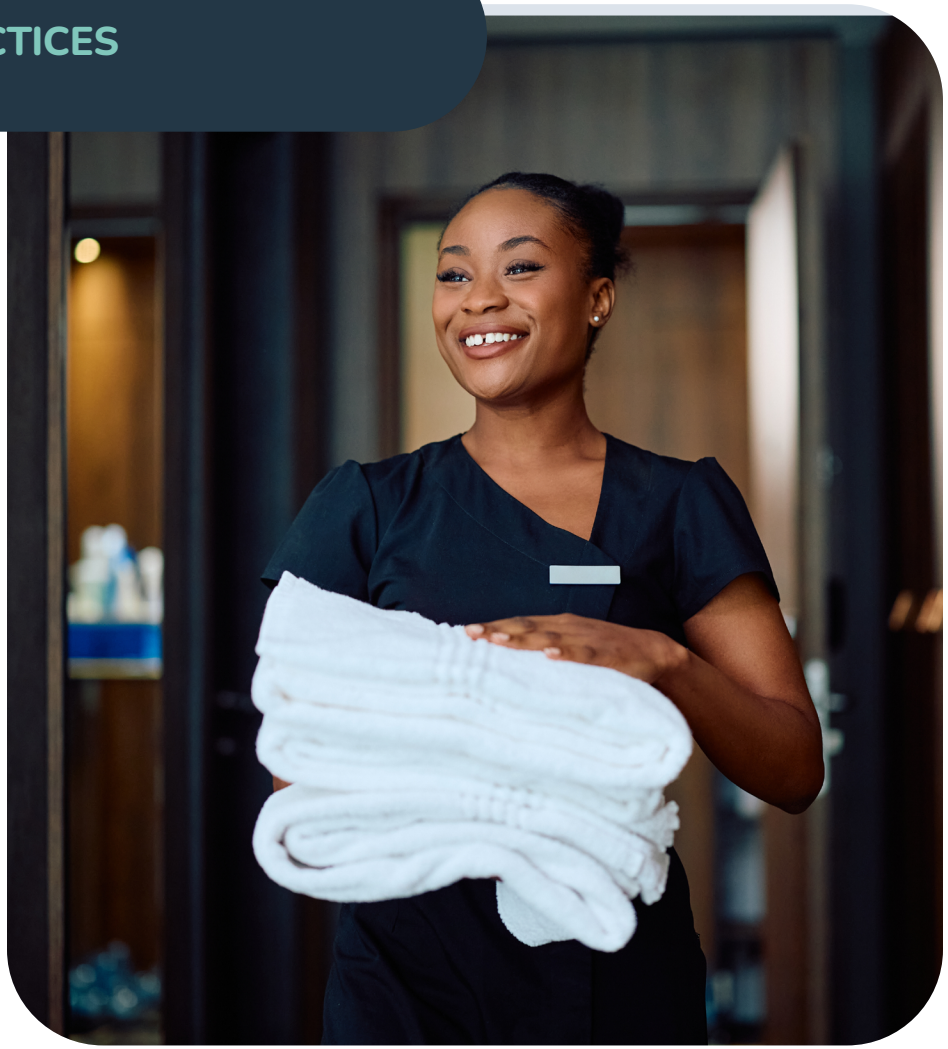
*Use the same decision tree to assess the need for comprehensive water audits.



ENERGY AND WATER MANAGEMENT PRACTICES

Every member of a hotel team has the responsibility to help achieve energy and water savings whenever and wherever they can. For instance, malfunctioning equipment, leaks, or broken windows/doors should be reported to Engineering or the GM as soon as possible and lights should be turned off in unoccupied areas. Each operational team also has more specific responsibilities that should be implemented daily or on another regular schedule.

PHASE 1: NO-COST OPERATIONAL PRACTICES



Phase 1 introduces ongoing practices for each operational team to adopt (where applicable) to drive energy and water conservation and/or reduction.

Encourage teams to implement the top practices listed for their discipline, as these efforts can yield significant energy/water reduction and cost savings for relatively low effort.

Make it a priority to highlight each operational team's energy and water-saving efforts during shift briefings, town halls, or other hotel-wide meetings to ensure all hotel staff stay informed and involved.

Did You Know?

Reducing energy use by 10% is the financial equivalent to a **$0.62 Average Daily Rate (ADR) increase for limited-service hotels and a $1.35 ADR increase for full-service hotels**. (EPA)

Did You Know?

Water is typically the **second largest utility expense** for hotels after energy, **comprising nearly 25% of total expenditures**. (Green Seal)

Note: Implementing energy and water management practices can help hotels achieve sustainability certifications such as Green Key Global (GKG). Review the GKG checklists in the following sections for more energy and water management practices to consider. Learn more about GKG on page 27.

HOUSEKEEPING

ENERGY MANAGEMENT PRACTICES

- **Turn Off Electronics -** Ensure unnecessary electronics such as televisions and lights are off when guest rooms are unoccupied
- **Close Curtains, Doors, and Windows -** Ensure curtains, doors and windows are closed in rooms after cleaning (unless doors/windows are being used for climate control)
- **Manage Thermostat Setpoints -** Set back thermostats to identified levels for heating and cooling

Helpful Tip

Set Point/Range Recommendations:

- 65-75°F in sold guest rooms
- When the room is sold and unoccupied raise/lower temp by 4°F
- When the room is unsold and unoccupied the cooling setpoint of 80°F and heating setpoint of 50°F
- When adjusting setpoints always ensure adequate humidity

- **Use Cold Water for Cleaning -** Use cold water when possible based on cleaning requirements and solution instructions; prioritize purchasing cleaning solutions designed for cold water use
- **Implement Linen and Towel Reuse Program -** Most hotels in the U.S. with this practice in place change linens every three days and only change towels upon guest request - communicating to guests about these practices is key to success

Did You Know?

It is estimated that the average guest room incurs nearly **$2,200 in energy costs annually.** (DOE)

WATER MANAGEMENT PRACTICES

Did You Know?

On average, leaks can account for **more than 6%** of a facility's total w ater use. (EPA)

- **Avoid Running Unnecessary Water -** When cleaning sinks, bathtubs, toilets and surfaces, ensure water is shut off when not needed for rinsing; consider no-rinse cleaners
- **Use Diluted Cleaning Solutions -** Fill a bucket or spray bottle with diluted cleaning solution for areas such as mirrors, countertops, fixtures, and other non-food contact surfaces to avoid needing to use fresh water more frequently to rinse
- **Use Dual-Chambered Mop Buckets -** Keeping dirty water and clean water separated will prevent contamination and require less fresh water during the cleaning process - clean water can be used longer without needing to dump and refill
- **Mop Only When Necessary -** Spot clean when possible, including when guests have declined full cleaning service and based on the cleaning requirement to avoid excess water use; consider no-rinse cleaners
- **Run Full Washing Equipment -** Only run dishwashers and laundry machines when they are at full capacity

Other operational housekeeping practices can be found on the Green Key Global Housekeeping Checklist.

CULINARY

ENERGY MANAGEMENT PRACTICES

- **Turn Off Kitchen Equipment -** Ensure hoods, ovens and gas-fired equipment are turned off when not in use
- **Close Refrigerators and Freezers -** Consolidate refrigerator trips to avoid opening/closing refrigerators and freezers
- **Consolidate refrigerators, freezers, and ice makers** - Avoid having multiple pieces of cooling equipment in service – ensure items are organized and space is optimized to minimize the amount of equipment needed

Did You Know?

Hotel kitchens can account for up to 12% of a hotel's total energy use. (EnergyTrust)

- **Clean Equipment Regularly** - Ensure filters, air ducts, fans, and burners are kept clean – preventing dirt, dust, and grease build up can lead to significant energy savings by maintaining efficient airflow
- **Use Standby Mode** - Put appliances such as ovens, fryers, and steamers on standby or idle mode to maintain readiness while using less energy during slow periods

Did You Know?

Dishwashing is the largest contributor to kitchen water use, especially with continuous-flow pre-rinse spray valves, inefficient dish machines, and poor operating practices. (CUWCC)

WATER MANAGEMENT PRACTICES

- **Run Dishwashers Optimally -** Only run dishwashers when full and use the shortest effective wash cycle for lightly soiled items
- **Thaw Frozen Items Optimally -** Thaw frozen items in water baths vs. running water to avoid excess water use
- **Wash Produce Optimally -** Wash produce in a filled basin or sink rather than under running water
- **Use Mops to Clean Floors -** Use mops or squeegees to clean floors instead of spraying with a hose
- **Use Soak Bins -** Use soak bins for pots, pans, and utensils instead of continuous rinsing under running water

Other operational culinary practices can be found on the Green Key Global Kitchen Checklist.



ENGINEERING

Engineering plays a key role in ensuring energy- and water-using equipment are performing optimally. Proper ongoing maintenance can result in better overall performance, longer-lasting equipment and energy and water savings.

RETRO-COMMISSIONING

Did You Know?

Retrocommissioning is a building's version of getting a tune-up to save energy and improve comfort.

Over time, heating, cooling, lighting, and control systems can stop working as efficiently as they should. Retro-commissioning, also known as recommissioning, is the process of checking and fixing how those systems run, without replacing major equipment. It focuses on low-cost improvements, such as adjusting thermostats, fixing broken sensors, and updating schedules, to save energy and make the building more comfortable. Water systems are increasingly being included in retro-commissioning studies.

Hotels should consider having a retro-commissioning study every 3-5 years. Studies can be available at no or low cost from utility companies, non-profit organizations, and energy consulting firms.

A building commissioning study, whether it is for new construction or existing buildings, is a valuable tool for improving performance, efficiency, and occupant comfort.

Helpful Tip

Visit the ASHRAE website to identify providers and check the DSIRE Database, Incentifind, ACEEE, Energy Star Rebate Finder and Utility Genius (or directly contact the hotel's utility company) to identify possible retro-commissioning incentives.

MEASUREMENT AND VERIFICATION

Measurement and verification (M&V) is the process of quantifying how much energy a project actually saves by comparing measured performance post-installation to a defined energy usage baseline. It is important for engineers to track M&V because it confirms that efficiency measures are working as intended, supports accountability and financing, and provides data-driven insights to optimize future performance.

Engineers should plan to perform M&V on the energy projects listed in Phases 2 and 3 of this guide and any other energy projects that require financial investment. This will result in a holistic understanding of the impact of energy projects throughout the hotel.

OTHER ENERGY MANAGEMENT PRACTICES

- Implement setback schedules for non-peak hours and unoccupied areas
- Monitor and reduce simultaneous heating and cooling
- Lower water heater setpoints (e.g., 120°F, where appropriate).
- Seal and close walk-in refrigerators/freezers properly

Helpful Tip

If work involves gas, refrigerants, high voltage, or proprietary software, it should likely be completed by a **licensed technician**.



ENERGY MANAGEMENT - PREVENTATIVE MAINTENANCE PRACTICES

Whether retro-commissioning is performed or not, ongoing preventative maintenance should be performed on all equipment and appliances that use energy and water. Determine if maintenance can likely be performed by hotel staff or a service provider is needed.



Did You Know?

Implementing operations and maintenance programs, including preventative maintenance, can result in **~5-20+% lower energy costs.** (DOE)

HOTEL STAFF MAINTENANCE

MAINTENANCE ACTIVITY	FREQUENCY
Clean or replace air filters	Every 1 to 3 months
Regularly clean condensing coils in refrigeration and air conditioning equipment	Every 3 to 6 months
Drain and flush hot water tanks to prevent efficiency-reducing scale build-up and deposits	Every 6 months
Inspect and upgrade all caulking and weather stripping preferably in the spring and fall	Twice per year
Clean air ducts	Every 3 to 5 years
Ensure control equipment such as variable frequency drives (VFDs) are not overridden	Monthly/quarterly
Implement Run-Time Schedules	Ensure HVAC and specialty gas equipment are only running when necessary

SERVICE PROVIDER MAINTENANCE

MAINTENANCE ACTIVITY	FREQUENCY
Elevator or Escalator System Maintenance	Monthly/quarterly (as required by code)
Energy Management System Updates	Annually
Boiler Inspections and Tuning	Annually
High-Voltage Electrical Systems	Annually
Kitchen Gas Equipment Calibration	Annually
Chiller and Central HVAC Maintenance	Twice per year

WATER MANAGEMENT PRACTICES

- **Measure Flow Rates -** Determine if faucets, showerheads, and toilets are operating optimally and efficiently

Helpful Tip

Low-Flow Fixtures

- Low Flow Toilets (1.28 gpf or below)
- Low Flow Urinals (0.5 gpf or below)
- Low Flow Faucets (1.5 gpm or below)
- Low Flow Showerheads (2.0 gpm or below)

*Ensure showers have adequate water pressure to avoid negatively impacting the guest experience

- **Check for Silent Leaks -** Easy, no-cost testing such as dye testing and paper towel testing can identify leaks in toilets and faucets

Hotel Spotlight

SINK AND SHOWER FLOW BALANCING IN ALL GUEST ROOMS

Luxury Boutique Hotel, Washington, DC, More than 200 Rooms

YoY Water Savings: **~378K gal**
Total Cost: ~**$16,000**
Annual Savings: ~**$5,000**
Payback Period: **1.2 years**

Upscale Boutique Hotel, San Francisco, CA - 50-200 Rooms

YoY Water Savings: **~439K gal**
Total Cost: ~**$10,000**
Annual Savings: ~**$17,000**
Payback Period: **7 months**

Hotel Spotlight

WATER MONITORING-WHOLE BUILDING

Resort Hotel, San Diego, CA - More than 200 Rooms

YoY Water Savings: **~16K gal**
Total Cost: ~**$16,000**
Annual Savings: ~**$17,000**
Payback Period: **7 months**



Did You Know?

A significant toilet leak can waste up to 4,300 gallons per day - up to **$1,400 per month**. (EPA)

- **Reduce Landscaping Evaporation -** Best time to irrigate is between 4:00 a.m. and 9:00 a.m. but check for optimal timing for the hotel's specific climate zone
- **Flush Hot Water Tanks -** Flush every six months (more frequently if water is very hard), to remove solids and sludge that have settled in the bottom of tanks
- **Cooling Tower Optimization -** Reduce the amount of energy use and water evaporation from cooling towers and apply for sewer credits

Helpful Tip

Reference cooling tower optimization resources from DOE to learn more.

Hotel Spotlight

A Nashville hotel replaced the water distribution media inside the cooling tower, which **restores efficient heat rejection, reduces strain on chillers, and lowers energy use**.

Did You Know?

A sewer credit is a utility billing adjustment that **reduces the amount charged for wastewater (sewer) services** when excess water doesn't go down the drain (it does not enter the sewer system).

Other operational engineering practices can be found on the Green Key Global Engineering Checklist.



SPA/FITNESS

ENERGY MANAGEMENT

- Ensure sauna and steam room doors are properly sealed and closed
- Ensure pools are set back to identified temperatures

Did You Know?

The energy consumption for each degree rise in temperature will cost **10%–30% more in energy costs**, depending on location. (DOE)

- Turn off fitness equipment displays and TV monitors when not in use
- Schedule preventive maintenance to ensure motors and belts run efficiently on fitness equipment
- Use timer controls or recirculation system controls to avoid 24/7 heating of pools and hot tubs

WATER MANAGEMENT

- Perform weekly inspections of all spa sinks, showers, tubs, and plumbing connections
- Set pool operating programs and temperatures to mitigate evaporation
- Cover tubs when not in use to reduce evaporation and heat loss

Did You Know?

Covering a pool when it is not in use is the most effective way to reduce pool heating costs with **savings of 50% to 70% possible**. (DOE)

- Eliminate continuous operation when saunas and steam rooms are unoccupied
- Only wash full loads - avoid partial-load washes for small towel batches when possible



CAPITAL INVESTMENTS

Phases 2 and 3 cover a wide variety of energy and water reduction projects; however, there are many more for hotels to consider. During the planning stages of any project the GM (or a designated team member) and the procurement and finance teams responsible for capital investments should work closely with the appropriate operational team(s) to ensure the investment adequately aligns with the desired outcome of reducing energy and/or water use.

Helpful Tip

Reference the Environmental Protection Agency (EPA) Energy and Water Checklist for Hotels, Motels and Inns for additional projects and practices to consider.

Upfront project costs and energy and water savings can vary significantly depending on hotel tier, property size, amenities, location, utility rates, available incentives, and climate. The energy and water savings and payback figures provided in the guide are intended as broad benchmarks to guide project prioritization.

Helpful Tip

Many of the "Hotel Spotlight" projects were **identified through professional energy and water audits**, underscoring the importance of this critical initial step.



Note: To develop accurate project cost estimates, hotel teams should conduct energy and water audits and collaborate with vendors on site specific analyses. Hotels should also review their individual utility bills to translate estimated energy and water savings into projected dollar savings, since actual financial impacts are highly dependent on local utility rates and billing structures. The "Hotel Spotlights" offer real-world financial examples, though results will naturally vary due to the factors noted. Click here to access the full Hotel Spotlights within the guide and more.

PHASE 2: LOW-COST QUICK WINS

Phase 2 introduces projects that require a relatively low-cost investment (typically between $5,000 - $20,000 for average-size hotels (100-150 rooms) with short payback periods typically less than 3 years.

Energy Reduction Projects: Quick Wins (~$5,000 - $20,000)

Project

ENERGY STAR CERTIFIED FOOD SERVICE EQUIPMENT

Description: Advanced design with more efficient compressors, insulation, and controls

Energy Savings: ~20% more efficient than standard models

Payback Period: Less than 2 years

Helpful Tip

When it's time to replace or upgrade appliances, ensure equipment is right-sized and always choose **ENERGY STAR® rated models** (when applicable), as they use less energy and water and cut utility costs without sacrificing performance.



Project

OCCUPANCY SENSORS FOR LIGHTING

Description: Automatically turn lights on when spaces are occupied and off when vacant, reducing unnecessary energy use and maintenance costs

Energy Savings: 24-62%

Payback Period: Less than 2 years

Project

SMART THERMOSTATS

Description: Automatically adjust temperature settings based on occupancy patterns and user preferences, improving comfort and reducing heating and cooling energy use

Energy Savings: 5-10%

Payback Period: 2-3 years

Project

WEATHERSTRIPPING

Description: Seals gaps around doors and windows to prevent drafts, improve comfort, and reduce heating and cooling energy use

Energy Savings: 5-10%

Payback Period: Less than 2 years

Project

E-TEMP RETROFIT SENSORS

Description: Smart temperature and defrost control system that reduces unnecessary compressor, fan, and heater operation energy use by sensing temperature of food rather than air

Energy Savings: 15-20%

Payback Period: 2-3 years



Hotel Spotlight

TEMPERATURE SENSORS FOR WALK-IN REFRIGERATOR AND FREEZER UNITS

Luxury Hotel, Boston, MA - 50-200 Rooms
4 E-Temp Sensors Installed

YoY Energy Savings: **~20%**
Annual Savings: ~**$1,000**
Total Cost: ~**$5,000**
Payback Period: **2.9 years**

Water Reduction Projects: Quick Wins (~$5,000 - $20,000)

Project

LOW FLOW FIXTURES

Description: Low-flow fixtures, such as faucets, showerheads, and toilets, are designed to use less water per minute or flush while maintaining performance, helping reduce both water and energy consumption

Energy Savings: 20% more water-efficient and perform as well or better than standard models

Payback Period: Less than 2 years (up to 3 years for toilets)

Hotel Spotlight

SHOWERHEAD REPLACEMENT IN ALL GUEST ROOMS - 2.2 TO 1.5 GALLONS PER MINUTE (GPM)

Luxury Hotel, San Francisco, CA - More than 200 Rooms

YoY Water Savings: ~**1.3M gal**
Annual Savings: ~**$22,000**
Total Cost: ~**$44,000**
Payback Period: **2 years**

Project

ENERGY STAR CERTIFIED DISHWASHERS

Description: Advanced technology and design to cut energy and water use

Energy Savings: 12% less energy and 30% less water than a standard model

Payback Period: ~1 year

Project

ENERGY STAR CERTIFIED WASHERS

Description: Advanced technology and designs to cut energy and water use

Energy Savings: Up to 20% less energy and 45% less water than standard models

Payback Period: 2-4 years



Project

FLOW OPTIMIZATION

Description: Balances and regulates water flow at sinks, showers, and other fixtures to ensure consistent pressure, improve guest comfort, and reduce water and energy waste

Water Savings: 10-30%

Payback Period: Less than 2 years

Hotel Spotlight

SMART VALVE IN ALL GUEST ROOMS

Resort Hotel, San Diego, CA - More than 200 Rooms

YoY Water Savings: ~**1.1M gal**
Annual Savings: ~**$16,000**
Total Cost: ~**$23,000**
Payback Period: **1.4 years**

PHASE 3: HIGHER COST CAPITAL EXPENDITURE INVESTMENTS

Phase 3 focuses on long-term opportunities that can deliver substantial savings and lower operating costs. These projects typically require larger upfront investments, careful strategic planning, and strong alignment before, during and after implementation; however, many projects still have short to medium-term payback periods despite the higher investment costs.

Note: Many of these projects can easily surpass $100,000, with costs often reaching several hundred thousand dollars and into the millions.

Energy Reduction Projects: (~$30,000 - $100,000+)

Project

ENERGY MONITORING SYSTEM (EMS)

Description: Sensors monitor HVAC, lighting, and other building systems to track performance, analyze energy use, and in some cases, measure water consumption

Energy Savings: ~10%

Payback Period: 1-2 years

Helpful Tip

EMS and BAS are foundational management tools that hotels should consider investing in before embarking on higher-cost energy and water reduction projects. By providing visibility into how energy and water are used, and potentially wasted, these systems help identify the best project opportunities, guide smarter project decisions, and maximize long-term savings.

Project

BUILDING AUTOMATION SYSTEM (BAS) – WHOLE BUILDING

Description: Controls HVAC, lighting, and other systems from a central platform, streamlining operations and improving efficiency compared to manual management

Energy Savings 10-25%

Payback Period: 3-5 years

Project

HEAT PUMPS (DUAL FUEL, ELECTRIC, VARIABLE REFRIGERANT FLOW)

Description: Efficiently deliver heating and cooling by transferring heat rather than generating it, reducing energy use compared to conventional systems

Energy Savings 25-50%

Payback Period: 5-12 years

Project

OCCUPANCY SENSORS FOR HVAC

Description: Automatically reduce or shut off HVAC systems in unoccupied spaces, cutting runtime and saving energy

Energy Savings: 10-30%

Payback Period: 1-3 years

Hotel Spotlight

GUESTROOM OCCUPANCY THERMOSTATS IN ALL GUEST ROOMS

Luxury Hotel, Seattle, WA - 50-200 Rooms

YoY Energy Savings: **~3%**
Annual Savings: **~$29,000**
Total Cost: **~$130,000**
Payback Period: **3.7 years**

Project

WINDOW FILM

Description: Applied to glass surfaces to cut solar heat gain and glare, reducing cooling loads and improving comfort

Energy Savings: 5-15%

Payback Period: 2-6 years

Hotel Spotlight

WINDOW FILM - WHOLE BUILDING

Luxury Hotel, Boston, MA - 50-200 Rooms

YoY Energy Savings: **~299,000 kWh**
Annual Savings: **~$40,000**
Total Cost: **~$158,000**
Payback Period: **3.9 years**



Project

LED LIGHTING UPGRADE

Description: Replace legacy lamps and fixtures with LED (light-emitting diode) lighting to dramatically improve energy efficiency and extend fixture life

Energy Savings: Up to 50%+

Payback Period: Less than 2 years

Hotel Spotlight

LED LIGHTING IN PUBLIC AND BACK OF HOUSE AREAS

Luxury Resort, Nassau County, FL - More than 200 Rooms

YoY Energy Savings: **~2.6%**
Annual Savings: **~$49,000**
Total Cost: **~$228,000**
Payback Period: **4.9 years**

Project

VARIABLE FREQUENCY DRIVES (VFDS) - HVAC

Description: Adjust motor speed to match system demand, significantly reducing energy use in fans and pumps

Energy Savings: 15-50%

Payback Period: 2-5 years

Hotel Spotlight

VARIABLE FREQUENCY DRIVES (VFDs) FOR HVAC

Luxury Hotel, Washington, DC - 50-200 Rooms

YoY Energy Savings: **~14.7%**
Annual Savings: **~$8,000**
Total Cost: **~$31,000**
Payback Period: **3.8 years**

Project

DEMAND CONTROLLED VENTILATION FOR KITCHEN HOOD EXHAUST

Description: Sensors adjust kitchen exhaust and make-up air fan speeds based on cooking activity, reducing energy use compared to fans running at full speed continuously

Energy Savings: 20-50%

Payback Period: 2-5 years

Hotel Spotlight

DEMAND CONTROL KITCHEN EXHAUST SYSTEM FOR MAIN KITCHEN

Premium Hotel, San Diego, CA - More than 200 Rooms

YoY Energy Savings: **~175,000 kWh**
Annual Savings: **~$44,000**
Total Cost: **~$91.000**
Payback Period: **1.8 years**

Project

ON-SITE SOLAR

Description: Generates renewable power, reducing grid electricity demand and utility costs

Energy Savings: Avoided energy savings varies based on size of the system

Payback Period: 4-10 years

Hotel Spotlight

718-KW ROOFTOP SOLAR SYSTEM

Upper-Upscale Resort, San Diego, CA - More than 200 Rooms

YoY Energy Savings: **~14.6%**
Annual Savings: **~$313,000**
Total Cost: **~$2.9M**
Payback Period: **4.5 years**



Water Reduction Projects: (~$30,000 - $100,000+)

Project

LAUNDRY WATER RECYCLING RECOVERY

Description: Captures, treats, and reuses laundry rinse water for subsequent wash cycles, reducing both water and energy consumption

Water Savings: 10-80%

Payback Period: 1-4 years

Hotel Spotlight

LAUNDRY WATER RECYCLING SYSTEM

Upper-Upscale Hotel, Reston, VA - More than 200 Rooms

YoY Energy Savings: **~16.8%**
Annual Savings: **~$59,000**
Total Cost: **~$200,000**
Payback Period: **4.6 years**

Project

OZONE LAUNDRY

Description: Replaces much of the hot water and harsh chemicals with ozone dissolved in cold water, a powerful disinfectant ideal for lightly soiled items like sheets, towels, and duvets

Water Savings: 10-25%

Payback Period: 2-3 years

Project

GRAYWATER REUSE SYSTEMS

Description: Collects and treats wastewater from sinks, showers, and laundry for reuse in non-potable applications such as toilet flushing and irrigation, reducing overall water demand

Water Savings: 20-50%

Payback Period: 5+ years

Project

DROUGHT TOLERANT LANDSCAPING/XERISCAPING

Description: Incorporates drought-tolerant plants, rocks, mulch, and other materials to create attractive landscapes that require minimal irrigation

Water Savings: 50%+

Payback Period: 2-10 years

Hotel Spotlight

XERISCAPING

Select-Service Hotel, Gainesville, FL - 50 to 100 Rooms

Planted pollinator-friendly and drought-tolerant species and installed drip irrigation resulting in a **98% reduction in irrigation!**

Note: Click here to access source documentation for the water and energy savings and payback information for all Phase 2 and 3 projects.



GREEN KEY GLOBAL SUSTAINABILITY CERTIFICATION

In partnership with the Hotel Association of Canada, AHLA co-owns and operates the Green Key Global certification program in the United States and Canada. Green Key Global (GKG) is a North American sustainability certification body for the hotel and lodging industry focusing on the operations of a hotel property.

Properties receive an eco-rating through an assessment and audit process that measures hotel performance in key areas including energy and water conservation, land use, hazardous and solid waste management, air quality and more.

With certified properties across North America, Green Key Global's flagship Eco-Rating Program is a trusted framework used by over 40 major management groups, including 100% of all Fairmont Hotels in North America. The award-winning certification is also endorsed by Booking.com and recognized by Travalyst, adding visibility, credibility, and booking advantages for participating hotels. Sustainably certified properties experience measurable results:

- Increased visibility on Online Travel Agencies (OTAs) platforms
- Higher success in business travel RFPs
- Significant savings in energy and waste costs

Implementing the energy and water management practices throughout all phases of the guide will assist properties that are pursuing Green Key Global (GKG) certification.



APPENDIX A: DEFINITIONS

Benchmarking - process of measuring, tracking, and comparing a building's energy performance over time or against similar building

Building Automation System (BAS) / Building Management System (BMS) - centralized platform that monitors, controls, and manages a building's systems including electrical and mechanical

Building Portfolio Standard (BPS) - set of performance benchmarks, policies, or regulatory requirements set by state and local governments to ensure consistent energy efficiency, water conservation, and sustainability practices in buildings. It establishes minimum performance levels that buildings are expected to meet or exceed.

Cooling Tower - heat rejection device that removes excess heat from a building, industrial process, or HVAC system by transferring it to the atmosphere. It typically cools water that has absorbed heat from air conditioning systems, industrial processes, or power plants.

Deregulated Energy Markets - government regulations have been removed to allow customers to choose from multiple energy providers

Energy - power derived from the utilization of physical or chemical resources, especially to provide light and heat or to work machines

Energy Efficiency - using less energy to perform the same task or achieve the same result,

Energy Management System (EMS) - centralized system that monitors, measures, and controls energy consumption in a building, facility, or portfolio of facilities to optimize efficiency and reduce costs

ENERGY STAR - U.S. government program, administered by the Environmental Protection Agency (EPA) and the Department of Energy (DOE), that helps consumers and businesses save money and reduce greenhouse gas emissions by identifying and promoting energy-efficient products and practices.

Energy Use Intensity (EUI) - metric that expresses a building's energy consumption relative to its size, typically measured as energy per unit of floor area per year

Gallons Per Flush (GPF) - unit of measure that indicates the amount of water a toilet uses each time it is flushed

Gallons Per Minute (GPM) - a unit of flow rate that measures how many gallons of liquid move through a pipe, fixture, or system in one minute

Graywater Reuse System - plumbing and treatment system that collects, treats, and reuses wastewater from sources such as sinks, showers, and laundry (excluding toilets and kitchen wastewater) for non-potable applications, such as irrigation, toilet flushing, or cooling tower makeup.

Greenhouse Gas Emissions Caps - regulatory or policy limits on the amount of greenhouse gases (GHGs) that an organization, building, or facility is allowed to emit over a defined period, typically measured in metric tons of CO_2 equivalent (CO_2e)

Demand Response - set of programs or strategies from utility companies in which electricity consumers adjust their power usage in response to grid conditions, electricity prices, or incentive signals to help balance supply and demand on the electrical grid.

Flow monitoring – process of measuring, tracking, and analyzing how much water flows through pipes, fixtures, and equipment in real time or over a set period - akin to having a speedometer and odometer for a water system

Ozone Laundry - laundry treatment system that injects ozone (O_3) into the wash water to assist with cleaning, sanitizing, and bleaching fabrics while reducing water, energy, and chemical usage compared to conventional laundering methods

Retro-commissioning/ Recommissioning - systematic process of evaluating, testing, and optimizing existing building systems (HVAC, lighting, controls, and other mechanical/electrical systems) to ensure they operate as intended and as efficiently as possible, without major equipment replacement.

Retrofitting - process of upgrading or modifying existing buildings, systems, or equipment to improve energy efficiency, reduce energy consumption, and lower operating costs, often through physical changes or replacements

Sub-metering - practice of installing meters beyond the main utility meter to measure energy (or water, gas, etc.) use in individual parts of a building or facility

System mapping - process of diagramming how energy and water flow through a facility—from input (supply) to output (use and waste) for HVAC, lighting, plumbing, laundry, kitchens, pools, etc.

Water Efficiency - minimizing water usage while still achieving the desired outcome, focusing on reducing waste and using water-saving technologies and practices rather than restricting water use

Water Use Intensity (WUI) - metric that expresses a building's water consumption relative to its size, occupancy, or output, typically measured as gallons of water per square foot per year (gal/ft²/year) or per occupant

Weather Normalization - statistical process used to adjust a building's energy or water consumption data to account for variations in weather conditions (temperature, humidity, or heating/cooling degree days)

Variable Frequency Drive (VFD) - electronic device that controls the speed and torque of an electric motor by varying the frequency and voltage of the electrical power supplied to the motor. VFDs are commonly used in HVAC systems, pumps, fans, and other motor-driven equipment to improve energy efficiency and system control.

Year Over Year (YoY) - method of comparing data from one period (usually a month or quarter) to the same period in the previous year to measure growth, decline, or trends

AHLA
AMERICAN HOTEL & LODGING ASSOCIATION

AHLA is a national association representing all segments of the U.S. lodging industry, including hotel owners, real estate investment trusts, chains, franchisees, management companies, independent properties, bed & breakfasts, state hotel associations, and industry suppliers. The industry is comprised of more than 64,000 properties, 33,200 of which are small businesses, and more than 5.6 million hotel rooms across the country. The American lodging industry services more than 1.4 billion rooms per year, supports more than 8.3 million jobs, and generates more than $54 billion in state and local tax revenue. AHLA strives to be an indispensable resource serving, supporting, and advocating on behalf of the American hospitality industry to build a vibrant and united hospitality industry that powers America's economy.

AHLA
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AHLA
RESPONSIBLE STAY

Hotel Spotlights:

A GUIDE TO HOTEL ENERGY & WATER MANAGEMENT

AHLA RESPONSIBLE STAY



AHLA
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DISCLAIMER: This guide was prepared in compliance with AHLA's Antitrust and Statistical Reporting policies. As part of its Responsible Stay initiative, AHLA provides this resource in support of the hotel industry's efforts to reduce carbon emissions through energy efficiency, waste reduction, water conservation, and responsible sourcing. Each business should determine the strategies, tools, vendors, or investments that best suits its needs. Actual costs, savings, and outcomes will vary depending on site conditions and technology choices. Case studies include self-reported data by hotels and have not been independently verified by AHLA.

BUILDING THE BUSINESS CASE – ENERGY & WATER SAVINGS ROI

AHLA RESPONSIBLE STAY

GEOGRAPHIC LOCATION: WASHINGTON, DC
CHAIN-SCALE/PROPERTY TYPE: LUXURY BOUTIQUE HOTEL
ROOM COUNT: 50-200

Summary: Indoor Water Conservation (IWC) conducted a comprehensive water use assessment and flow balancing project designed to reduce waste, lower utility costs and improve guest satisfaction.

PROJECT DESCRIPTION

IWC conducted a water use assessment, measuring variations in water pressure and flow volumes.

Outcomes from the assessment included:

- Performed initial detailed Efficiency Assessment.
- Audited and calibrated shower and sink flows property-wide
- Verified savings with a post-installation audit

The project delivered balanced flows across all rooms, reducing waste while improving guest experience

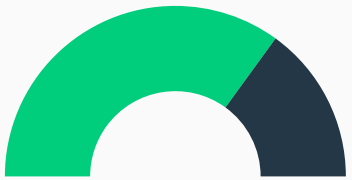
FINANCIAL ANALYSIS / ROI

Capex Breakdown: ~$16,000 ($8,952 installation cost)

Projected Annual Savings:
Utility Cost Savings: ~$5,000
Energy Savings: 6,300 therms
Water Savings: ~378,000 gallons

Payback period: 14.5 months

IMPACT & BENEFITS



~378K gallons
YoY energy reduction

~$5,000
Avoided annual energy cost

14.5 months
Payback period

Intangible benefits

Balancing shower flows ensures precise, targeted (1.75 gpm) delivery in every room on every floor – eliminating uneven showers and creating a consistently excellent guest experience.

BUILDING THE BUSINESS CASE – ENERGY & WATER SAVINGS ROI

LOCATION: CALIFORNIA
CHAIN SCALE/PROPERTY TYPE: UPSACEL BOUTIQUE HOTEL
ROOM COUNT: 50-200

Summary: A comprehensive water use assessment was conducted and a flow balancing project was designed to reduce waste, lower utility costs and improve guest satisfaction.

PROJECT DESCRIPTION

Indoor Water Conservation (IWC) conducted a property-wide water use assessment to reduce waste, cut utility costs and improve guest satisfaction.

Outcomes from the assessment included:

- Auditing water pressure and flow volumes
- Calibrating shower and sink flows across all rooms
- Verifying savings with a post-installation audit

After the assessment, only sinks were upgraded. The installation was completed in July 2021.

Other fixtures that were not addressed during this assessment will be included in a water audit/assessment every 5 years.

FINANCIAL ANALYSIS / ROI

Capex Breakdown: ~$10,000 (includes product, calibration and assessment)
- Installation was conducted by the hotel engineering team

Annual Savings:
- **Utility Cost Savings (energy):** ~$3,000
- **Utility & Sewer Cost Savings (water):** ~$14,000
- **Energy Savings:** 1,955 therms

- **Payback Period:** 7 months

IMPACT & BENEFITS



~439,000 gallons
YoY water reduction

~$17,000
Avoided annual water, sewer and energy cost

7 months
Payback period

Intangible Benefits:

Balancing sink flows ensures precise, targeted (1.00 gpm) delivery in every room on every floor - creating a consistently excellent guest experience.

BUILDING THE BUSINESS CASE – ENERGY & WATER SAVINGS ROI

AHLA RESPONSIBLE STAY

LOCATION: MASSACHUSETTS
CHAIN-SCALE/PROPERTY TYPE: LUXURY HOTEL
ROOM COUNT: 50-200

Summary: The following energy and water conservation measures were bundled. All financial and energy/water savings are reported as one combined project.
The hotel has a Green Key Global certification.

PROJECT DESCRIPTION

This project has the following energy conservation measures (ECMs):

- **Temperature Sensors**
- Installed four units in walk-in refrigerators and freezers
  - Cost: ~$5,000
  - Annual Savings: ~$1,700
  - Payback: 2.9 years
  - 4.3% of the total 302,079 kWh savings = 3,079 kWh

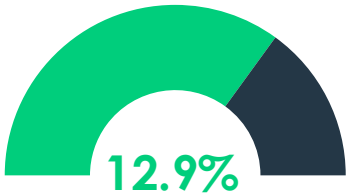
- **Window Film**
- Whole building installation to reduce solar heat gain
  - Cost: ~$158,000
  - Annual Savings: ~$40,000
  - Payback: 4 years
  - 95.7% of the total 302,079 kWh savings = 299,000 kWh

FINANCIAL ANALYSIS / ROI

Capex Breakdown: ~$160,000 (combined projects)

Annual Savings:
- **Utility Cost Savings:** ~42,000
- **Energy Savings**: ~302,000 kWh
- The combined project will reduce the building's carbon footprint by ~200 metric tons of CO2.

IMPACT & BENEFITS



12.9%
YoY energy reduction
(combined projects)

~$42,000
Avoided annual energy cost
(combined projects)

3.9 years
Payback period
(combined projects)

Intangible Benefits:

- Window film blocks up to 99% of harmful UV rays, protecting guests and workers skin and eyes from sun damage
- Window film reduces glare on screens and monitors, making it a more comfortable experience to work or watch TV
- Assists with BPS (Building Performance Standard) Compliance
- Attracts Eco-Friendly Travelers

BUILDING THE BUSINESS CASE – ENERGY & WATER SAVINGS ROI

AHLA RESPONSIBLE STAY

LOCATION: CALIFORNIA
CHAIN-SCALE/PROPERTY TYPE: LUXURY HOTEL
ROOM COUNT: MORE THAN 200

Summary: A retrofit toilet tank system was installed in every guest room. The system is a smart flush valve technology that automatically detects leaks and optimizes water usage by controlling and reducing the amount of water used per flush, helping conserve water and prevent continuous running toilets.

PROJECT DESCRIPTION

At the end of quarter 1 in 2025 the hotel installed the retrofit toilet tank system in each guest room toilet.

-This was completed over the course of a week with our engineering team completing anything that the install team was unable to do, due to occupancy constraints.

-The solution ensures all valves and fittings are seamless not allowing for any leaks.

-The product also creates a stronger vacuum flush while using less water even with the California mandated low gallon toilets.

-In addition to this project, we also replaced every guest room shower head, going from roughly 2.2 gallons per minute to heads that were balanced and only allowing 1.5 gallons per minute.

FINANCIAL ANALYSIS / ROI

Capex Breakdown:
- **Total Cost: ~**$44,000, equipment & labor inclusive.

Projected Annual Savings:
- **Utility Cost Savings:** $22,000.
- **Water Savings:** 1,346,800 gallons

Payback:
- **Payback period:** 2 years
- **ROI (return on investment):** 51%

IMPACT & BENEFITS



~1.3M gallons
YoY water reduction

~$22,000
Avoided annual water cost

2 years
Payback period

Intangible Benefits:

Both installations speak to the hotel's sustainable practices and putting a priority on protecting our natural resources. We have seen a reduction in toilet clogs and issues with flushing complaints from guests, along with reduced issues over shower/water pressure.

BUILDING THE BUSINESS CASE – WATER & SEWER SAVINGS ROI

LOCATION: CALIFORNIA
CHAIN-SCALE/PROPERTY TYPE: RESORT HOTEL
ROOM COUNT: MORE THAN 200

Summary: The water efficiency project was completed, combining smart valve technology and real-time monitoring to reduce water and sewer costs by an estimated 15% annually while improving metering accuracy, leak detection, and system performance.

PROJECT DESCRIPTION

The water efficiency proposal focused on reducing water and sewer costs through advanced flow control and monitoring technologies.

The proposal includes:

- Review of historical water and sewer bills to analyze cost structure and identify the portion based on volumetric usage
- Recommendation to install the smart valve technology to reduce air volume measured by the water meter
- Integration of a Smart Water Monitor to enable real-time usage tracking and leak detection
- Coordination with a certified plumbing partner for installation
- Detailed savings estimates, ROI calculations, and projected payback period based on property-specific billing data

The project is designed to improve water efficiency, reduce costs, and support sustainability goals without disrupting operations or guest experience.

FINANCIAL ANALYSIS / ROI

Capex Breakdown: ~$23,000 (combined projects)

- **Smart Valve Equipment:** $16,200
- **Installation (by licensed commercial plumber):** $7,389

Projected Savings:

- **Utility Cost & Sewer Savings:** ~$16,000

Projected Payback Period: 1.4 years
ROI (return on investment): 1,020% over 10 years

IMPACT & BENEFITS



~$16,000
Avoided annual water & sewer cost

~1.1M gallons (about 2 Olympic sized swimming pools)
YoY water reduction

1.4 years
Payback period

Intangible Benefits

- **Improved Metering Accuracy:** Reduces false readings caused by air in the water line, leading to more accurate billing.
- **Increased System Efficiency:** By reducing turbulence and pressure spikes related to entrained air, the system may operate more smoothly, even with a booster pump.
- **Reduced Mechanical Strain:** May contribute to reduced wear on isolation valves, backflow preventers, regulators, and meters, potentially extending their useful life.
- **Leak Detection Support:** By stabilizing flow patterns, the smart valve can make abnormal usage more noticeable- especially when paired with a Smart Water Monitor.
- **Supports Sustainability Goals:** Helps the property lower its water footprint, supporting corporate ESG initiatives and potential recognition under programs like AHLA's Responsible Stay.
- **Tenant/Resident Satisfaction:** Any reductions in water-related maintenance, disruptions, or billing irregularities can translate to a better resident experience.

BUILDING THE BUSINESS CASE – ENERGY & WATER SAVINGS ROI

LOCATION: WASHINGTON
CHAIN SCALE/PROPERTY-TYPE: LUXURY HOTEL
ROOM COUNT: 50-200

Summary: Installed guestroom occupancy thermostats as part of an effort to achieve compliance for Washington State's Clean Building Performance Standard. The project was awarded a state grant of $130,000 to cover the full cost of the project.

PROJECT DESCRIPTION

Guestroom occupancy thermostats with an accessible front-end can provide energy savings for hotels, particularly when a hotel is using expensive HVAC energy.

Guestroom occupancy thermostats allow room temperatures to float through a wider setback range when a room is unoccupied based on a motion sensor in the thermostat. The system also allows rooms to have a deeper setback if the room is unsold.

InSite performed an Energy Audit as part of the hotel's compliance for Washington State's Clean Building Performance Standard. After identifying guestroom occupancy thermostats as a project, InSite applied for a state grant on the hotels behalf. The hotel received $130,000 to implement this measure completely for free.

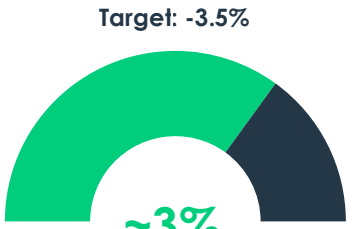
FINANCIAL ANALYSIS / ROI

Capex Breakdown: ~$130,000 (includes equipment and labor)

Projected Savings:
- **Utility Cost Savings:** ~$29,000
- **Energy Savings**: 179,910 kWh
- **Rebates/Incentives:** $130,000 from a state grant covered 100% of the project cost

Payback Period: 3.7 years (0 years with incentive)
ROI (return on investment): 27% without incentive

IMPACT & BENEFITS



YoY energy reduction

~$29,000
Avoided annual energy cost

3.7 years
Payback period

Intangible benefits

This project was part of the building's requirement to achieve compliance with Washington State's Clean Building Performance Standard. The standard requires the building to conduct a Level 2 Energy Audit and complete all financially viable energy conservation measures (ECMs). The project also results in increased maintenance efficiency and extended equipment life.

BUILDING THE BUSINESS CASE – ENERGY & WATER SAVINGS ROI

AHLA RESPONSIBLE STAY

LOCATION: FLORIDA
CHAIN-SCALE/PROPERTY TYPE: LUXURY RESORT
ROOM COUNT: MORE THAN 200

Summary: LED lighting upgrade project aimed at enhancing operational efficiency and sustainability. The project is forecasted to save the property over $49K in annual utility spend and payback in under 5 years, demonstrating a strong return on investment and aligning with our strategic sustainability goals.

PROJECT DESCRIPTION

This project involves the strategic replacement of outdated lighting fixtures with high-efficiency LED bulbs across various public and back-of-house areas at the Ritz-Carlton Amelia Island. By enhancing lighting efficiency, the project aims to achieve significant energy savings, reduce maintenance costs, and improve overall lighting quality within the facility.

Scope and Implementation: The project scope was meticulously planned and approved by the property management teams, ensuring alignment with operational needs and energy efficiency goals. The areas targeted for upgrades include but are not limited to:

- Housekeeping and laundry rooms
- Men's and women's locker rooms
- Spa areas
- Executive offices
- Back-of-house stairwells
- Parking lot and garages
- Loading docks
- Mechanical and storage rooms
- Food prep and banquet kitchens
- Meeting rooms
- Retail

FINANCIAL ANALYSIS / ROI

Capex Breakdown: ~$228,000

Projected Annual Savings:

- **Utility Cost Savings:** ~$49,000
- **Energy Savings:** 324,000 kWh
- Estimated annual re-lamp avoidance of $2,700 was not included in the financial model that would have increased returns.

Payback Period: 4.9 years
IRR (Internal Rate of Return): 14.7%

IMPACT & BENEFITS



~2.6%
YoY electricity reduction

~$49,000
Avoided annual energy cost

4.9 years
Payback period

Intangible Benefits:

Maintenance Efficiency: Decreased frequency of bulb replacements due to the longer lifespan of LED technology.

Enhanced Lighting Quality: Improved illumination contributing to better work environments and guest experiences.

BUILDING THE BUSINESS CASE – ENERGY & WATER SAVINGS ROI

AHLA RESPONSIBLE STAY

LOCATION: WASHINGTON, DC
CHAIN SCALE/PROPERTY TYPE: LUXURY HOTEL
ROOM COUNT: 50-200

Summary: Old motors were replaced with Variable Frequency Drive (VFD) compatible motors. This allowed for VFDs to be added to the close and open loops of the system which helps with energy efficiency when running the HVAC system.

PROJECT DESCRIPTION

The old motors were not compatible with VFD's, so they were replaced with VFD compatible motors

- Energy efficiency opportunity was identified in our old 15-HP motors as they were not compatible with VFD's
- 3 new 15-HP motors were installed and 2 VFD's were added to the close and open loops
- The VFD's help to save energy by reducing the starting amps of the motor and adjusting frequency of the electrical power based on demand

FINANCIAL ANALYSIS / ROI

Capex Breakdown: ~$31,000 (includes parts and installation)

Projected Annual Savings:
- **Utility Cost Savings:** ~$8,000

Payback Period: 3.8 years

IMPACT & BENEFITS



~14.7%
YoY energy reduction

~$8,000
Avoided annual energy cost

3.8 years
Payback period

Intangible Benefits:

The variable speeds of the motors reduces the wear and tear on the equipment and optimizes the motor's performance

BUILDING THE BUSINESS CASE – ENERGY & WATER SAVINGS ROI

LOCATION: CALIFORNIA
CHAIN-SCALE/PROPERTY TYPE: FULL-SERVICE, PREMIUM HOTEL
ROOM COUNT: MORE THAN 200

Summary: An energy saving system was installed to control kitchen hood exhaust fan speed depending on needs and reducing the amount of wasted conditioned air. The hotel has a Green Key Global certification.

PROJECT DESCRIPTION

This project consisted of the replacement of the outdated and inefficient kitchen exhaust hood ventilation control for the main kitchen and the installation of a new control system.

The system controls the exhaust fans' speed according to the kitchen needs; this will avoid the system to run 100% all the time.

The system consists of temperature and smoke sensors that varies the exhaust motor speed to reduce the volume of exhausted air; this way the system will save energy by reducing the electric motors consumption and by reducing the amount of wasted conditioned air.

FINANCIAL ANALYSIS / ROI

Capex Breakdown: ~$91,000
- **California Food Service rebate**: -$10,800.00

Annual Savings:
- **Total Utility Cost Savings:** $44,000
- **Fan Energy Savings:** $38,000
- **Heating Savings:** $3,000
- **Cooling Savings:** $3,000
- **Electrical Savings:** 175,699 kWh

Payback Period: 1.8 years
Return on Investment (return on investment): 55.6%
Savings-to-Investment Ratio: 3.8

Rebates: California Foodservice Rebate at $600/Exhaust Fan Horsepower $10,800.00

IMPACT & BENEFITS



~175,000 kWh
YoY energy reduction

~$44,000
Avoided annual energy cost

1.8 years
Payback period

Intangible Benefits:

By avoiding the exhaustion of conditioned air when is not necessary, this systems helps to maintain a more comfortable space in kitchens and restaurants.

BUILDING THE BUSINESS CASE – ENERGY & WATER SAVINGS ROI

GEOGRAPHIC LOCATION: CALIFORNIA
CHAIN-SCALE/PROPERTY TYPE: UPPER-UPSCALE RESORT
ROOM COUNT: MORE THAN 200

AHLA RESPONSIBLE STAY

Summary: Rooftop solar PV installation project aimed at enhancing operational efficiency and sustainability. The project is forecasted to save the property over $320K in annual utility spend and payback in just under 4 and a half years, demonstrating a strong return on investment and aligning with our strategic sustainability goals.

PROJECT DESCRIPTION

This project entails a capital investment of just under $3M for the installation of a 718-kW solar photovoltaic (PV) system strategically installed on the main hotel rooftop and select villa rooftops at the Coronado Island Marriott Resort & Spa, ensuring no disruption to guest views or experiences. The project aims to reduce energy costs, increase grid stability, and enhance sustainability at the project by harnessing renewable energy sources.



FINANCIAL ANALYSIS / ROI

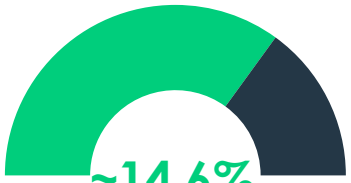
Capex Breakdown: ~$2.9M

Projected Annual Energy Savings:
- **Utility Cost Savings:** ~$313,000
- **Energy Savings:** 1,108,000 kWh

Payback Period: 4.5 years
IRR (Internal Rate of Return): 20.2%

Incentives:
- A federal tax credit worth 30% of the project's investment, or $893K, was available and included in the model.

IMPACT & BENEFITS



YoY electricity reduction

~$313,000
Avoided annual energy cost

4.5 years
Payback period

Intangible Benefits:

Enhanced Perception: Guests often appreciate eco-friendly initiatives, contributing to a positive perception of the resort as a sustainable and forward-thinking destination.

Future-Proofing: By adopting solar energy, the resort is better positioned to meet any future regulatory requirements related to carbon emissions and energy efficiency, reducing the risk of potential fines or legal issues.

BUILDING THE BUSINESS CASE – ENERGY & WATER SAVINGS ROI

GEOGRAPHIC LOCATION: VIRGINIA
CHAIN-SCALE/PROPERTY TYPE: UPPER-UPSCALE FULL-SERVICE HOTEL
ROOM COUNT: MORE THAN 200

Summary: Laundry-water recycling system installation project aimed at enhancing operational efficiency and sustainability. The project is forecasted to save the property over $59K in annual utility spend and payback in under 5 years, demonstrating a strong return on investment and aligning with our strategic sustainability goals.
This hotel has a Green Key Global certification (4 keys)

PROJECT DESCRIPTION

This project involves the installation of a laundry-water recycling system at the Hyatt Regency Reston, a technology designed to significantly reduce both energy and water consumption from commercial-scale laundry operations. This initiative aligns with Host's commitment to sustainability and energy efficiency.

Scope and Implementation: The laundry-water recycling system enables the hotel to recycle and reuse wastewater from laundry operations, reducing the demand for fresh water and energy by harvesting the temperature of recycled water.

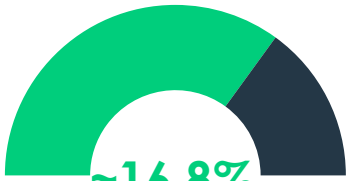
FINANCIAL ANALYSIS / ROI

Capex Breakdown: ~$210,000

Projected Annual Savings:
Water Savings: 3,500 kGals
Utility Cost Savings: (water) ~$38,000 annually
Savings Energy: 20,000 therms
Utility Cost Savings (energy": ~$21,000 annually

Payback Period:
- **Simple Payback Period**: 4.6 years
- **IRR**: 16.8%

IMPACT & BENEFITS



~16.8%
YoY water reduction

~$59,000
Avoided annual energy & water cost

4.6 years
Payback period

Intangible Benefits:

Increases the property's green credentials and enhances sustainability marketing by demonstrating a tangible commitment to environmentally responsible practices.

BUILDING THE BUSINESS CASE – ENERGY & WATER SAVINGS ROI

AHLA RESPONSIBLE STAY

LOCATION: CALIFORNIA
CHAIN-SCALE/PROPERTY TYPE: BOUTIQUE FULL-SERVICE
ROOM COUNT: 50-200

Summary: A comprehensive water use assessment was conducted and a flow balancing project was designed to reduce waste, lower utility costs and improve guest satisfaction.

PROJECT DESCRIPTION

Outcomes from the assessment included:

- Auditing water pressure and flow volumes
- Calibrating shower and sink flows across all rooms
- Verifying savings with a post-installation audit

Only showers were upgraded to bring flow from 2.94 gpm to 2.00 gpm. The installation was completed in July 2021.

Other fixtures that were not addressed during this assessment will be included in a water audit/assessment every 5 years.

FINANCIAL ANALYSIS / ROI

Capex Breakdown: ~$9,000 (includes product, calibration and assessment
- Installation was conducted by the hotel engineering team

Annual Savings:
- **Utility Cost Savings (energy)**: $5,000
- **Energy Savings:** 4,075 therms
- **Utility Cost & Sewer Savings (water)**: $22,000
- **Water Savings:** 763,998 gallons

- **Payback Period:** 4.3 months

IMPACT & BENEFITS



~764,000 gallons
YoY water reduction

~$27,000
Avoided annual water, sewer and energy cost

4.3 months
Payback period

Intangible Benefits:

Balancing shower flows ensures precise, targeted (2.00 gpm) delivery in every room on every floor – creating a consistently excellent guest experience.

BUILDING THE BUSINESS CASE – ENERGY & WATER SAVINGS ROI

LOCATION: CALIFORNIA
CHAIN-SCALE/PROPERTY TYPE: BOUTIQUE FULL-SERVICE
ROOM COUNT: 50-200

Summary: A comprehensive water use assessment was conducted and a flow balancing project was designed to reduce waste, lower utility costs and improve guest satisfaction.

PROJECT DESCRIPTION

Outcomes from the assessment included:

- Auditing water pressure and flow volumes
- Calibrating shower and sink flows across all rooms
- Verifying savings with a post-installation audit

After the assessment, only sinks were upgraded with aerators. The installation was completed in July 2021.

Other fixtures that were not addressed during this assessment will be included in a water audit/assessment every 5 years.

FINANCIAL ANALYSIS / ROI

Capex Breakdown:

- **Total Cost:** ~$4,000 (includes product, calibration and assessment)
- Installation was conducted by the hotel engineering team

Annual Savings:

- **Utility Cost Savings (energy):** $500
- **Energy Savings:** 381 therms
- **Utility & Sewer Cost Savings (water):** $2,000
- **Water Savings:** 76,212 gallons

Payback Period: 1.6 years

IMPACT & BENEFITS



~76,000 gallons
YoY water reduction

~$2,500
Avoided annual water, sewer and energy cost

1.6 years
Payback period

Intangible Benefits:

Balancing sink flows ensures precise, targeted (1.00 gpm) delivery in every room on every floor - creating a consistently excellent guest experience.

BUILDING THE BUSINESS CASE – ENERGY & WATER SAVINGS ROI

GEOGRAPHIC LOCATION: CALIFORNIA
CHAIN-SCALE/PROPERTY TYPE: LUXURY URBAN HOTEL
ROOM COUNT: MORE THAN 200

Summary: LED lighting upgrade project aimed at enhancing operational efficiency and sustainability. The project is forecasted to save the property over $207K in annual utility spend and payback in under 4 years, demonstrating a strong return on investment and aligning with our strategic sustainability goals.
The hotel has a Green Key Global certification. (4 keys).

PROJECT DESCRIPTION

This project involves the strategic replacement of outdated lighting fixtures with high-efficiency LED bulbs across various public and back-of-house areas at the Manchester Grand Hyatt San Diego. By enhancing lighting efficiency, the initiative aims to achieve significant energy savings, reduce maintenance costs, and improve overall lighting quality within the facility.

Scope and Implementation: The project scope was meticulously planned and approved by the property management teams, ensuring alignment with operational needs and energy efficiency goals. The areas targeted for upgrades include but are not limited to:

- Housekeeping and laundry rooms
- Back-of-house corridors and stairwells
- Service areas and elevators
- Executive offices
- Back-of-house stairwells
- Parking lot and garages
- Guestroom stairwells
- Mechanical and electrical rooms
- Exterior lighting

FINANCIAL ANALYSIS / ROI

Capex Breakdown: ~$752,000

Annual Energy Savings:

- **Utility Cost Savings:** $207,000 annually
- **Energy Savings:** ~$1,032,000 kWh
- Estimated annual re-lamp avoidance of ~$11,600 was not included in the financial model that would have increased returns.

Payback Period: 3.9 years
IRR: 17.8%

IMPACT & BENEFITS



~5.1%
YoY electricity reduction

~$207,000
Avoided annual energy cost

3.9 years
Payback period

Intangible Benefits:

Maintenance Efficiency: Decreased frequency of bulb replacements due to the longer lifespan of LED technology.

Enhanced Lighting Quality: Improved illumination contributing to better work environments and guest experiences.

BUILDING THE BUSINESS CASE – ENERGY & WATER SAVINGS ROI

LOCATION: FLORIDA
CHAIN SCALE/PROPERTY TYPE: RESORT HOTEL
ROOM COUNT: 50-200

Summary: Converted over 300 fluorescent bulbs in parking garage to LEDs to save energy costs and lifespan of bulbs

PROJECT DESCRIPTION

The project included changing the 300+ fluorescent bulbs for direct replacement bulbs, which only required labor to change the bulbs changing the ballasts.

FINANCIAL ANALYSIS / ROI

Capex Breakdown:
- **Total Cost:** ~$7,000

Projected Savings:
- **Utility Cost Savings:** ~$15,000

Payback Period:
- **Payback period:** 5.3 months
- **ROI (return on investment):** 227.3%

IMPACT & BENEFITS



~86,000kWh
YoY energy reduction

~$15,000
Avoided annual energy cost

5.3 Months
Payback period

Intangible Benefits:

The LED lighting is much cleaner and brighter, ensuring greater safety for guests and their vehicles in our garage.

BUILDING THE BUSINESS CASE – ENERGY & WATER SAVINGS ROI

AHLA RESPONSIBLE STAY

LOCATION: ILLINOIS
CHAIN SCALE/PROPERTY TYPE: FULL-SERVICE UPSCALE
ROOM COUNT: MORE THAN 200

Summary: A comprehensive water assessment was conducted and a flow balancing technology was installed to eliminate inefficient water and energy usage caused by unbalanced shower flows.

PROJECT DESCRIPTION

Comprehensive Water Assessment

- Conducted a comprehensive initial efficiency assessment.
- Audited and calibrated water flow rates for showers and sinks across 356 guestrooms.
- Performed a post-installation audit to verify water savings.

Project Highlights:

- Achieved balanced water flow across all guestroom shower heads effectively reducing water waste while enhancing the guest experience.
- Replaced all shower flow limiters to optimize efficiency.
- Attempted to upgrade faucet flow limiters; however, the reduced flow caused usability issues and negatively impacted the guest experience. As a result, faucet modifications were not implemented.

FINANCIAL ANALYSIS / ROI

Capex Breakdown

- **Total Cost:** ~$17,000

Projected Annual Savings (Shower & Faucet Flow Limiters)

- **Utility Cost Savings:** ~$41,000
- **Water Savings:** 5,479,713 gallons
- **Payback Period:** 5.0 months (Guaranteed ROI)

Actual Annual Savings (Shower Flow Only)

- **Utility Cost Savings:** 1,664,400 gallons
- **Actual Cost Reduction:** ~$16,000

IMPACT & BENEFITS



~1.7M gallons

~$16,000
Avoided Annual Cost Reduction

5 Months
Payback Period

Intangible benefits

Balancing shower flows ensures precise, targeted (2.00 gpm) delivery in every room on every floor – eliminating uneven showers and creating a consistently excellent guest experience.

BUILDING THE BUSINESS CASE – ENERGY & WATER SAVINGS ROI

LOCATION: PENNSYLVANIA
CHAIN-SCALE/PROPERTY TYPE: FULL-SERVICE HOTEL
ROOM COUNT: 50-200

Executive summary: The following energy and water conservation measures were bundled. All financial and energy/water savings are reported as one combined project. This hotel has a Green Key Global certification.

PROJECT DESCRIPTION

This project has the following energy and water conservation measures (ECMs and WCMs):

- **Temperature Sensors for Walk-in Refrigeration and Freezer Units**
  - Cost: ~$15,000
  - Annual Savings: ~$5,000
  - Payback: 2.9 years
  - 7.1% of the total 1,123,989 kWh savings
- **LED Lighting Upgrade**
  - Cost: ~$46,000
  - Annual Savings: ~$7,000
  - Payback: 6.1 years
  - 5.1% of the total 1,123,989 kWh savings
- **Variable Frequency Drives**
  - Cost: ~$260,000
  - Annual Savings: 68,101
  - Payback: 3.9 years
  - 87.8% of the total 1,123,989 kWh savings
- **Toilet Tank Retrofits**
  - Cost:~ $79,000
  - Annual Savings: $21,754
  - Payback: 3.7 years

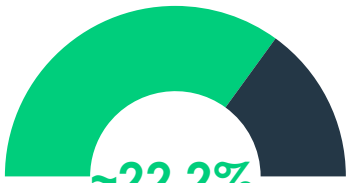
FINANCIAL ANALYSIS / ROI

Capex Breakdown: ~$672,000 (combined projects)

Annual Savings:
- **Utility Cost Savings:** ~$196,000
- **Energy Savings:** 1,123,989 kWh
- **Water Savings:** 156,500 gallons
- The combined project will reduce the building's carbon footprint by 271 metric tons of CO2 annually.

Payback Period: 3.9 years
Simple ROI (return on investment): 29.2%

IMPACT & BENEFITS



~22.2%
YoY energy reduction

~$196,000
Avoided annual energy cost

3.9 years
Payback period

Intangible Benefits:

- LED lighting enhances guest experience through improved ambiance, safety, and comfort
- Assists with Building Performance Standard Compliance
- Attracts Eco-Friendly Travelers

BUILDING THE BUSINESS CASE – ENERGY & WATER SAVINGS ROI

AHLA RESPONSIBLE STAY

LOCATION: WASHINGTON, D.C.
CHAIN-SCALE/PROPERTY TYPE: FULL-SERVICE HOTEL
ROOM COUNT: 50-200

Summary: The following energy and water conservation measures were bundled. All financial and energy/water savings are reported as one combined project. This hotel has a Green Key Global certification.

PROJECT DESCRIPTION

The project has the following energy and water conservation measures (ECMs and WCMs):

- **Demand Controlled Ventilation for Kitchen Hood Exhaust**
  - Cost: ~$38,000
  - Annual Savings: ~$10,000
  - Payback: 3.7 years
  - 11.88% of the total 505,668 kWh savings
- **Occupancy-Based Thermostats**
  - Cost: ~$45,000
  - Annual Savings: ~$13,000
  - Payback: 3.3 years
  - 28.21% of the total 505,668 kWh savings
- **Rooftop Solar PPA (photovoltaics)**
  - Cost: covered by Washington, DC solar incentives
  - Annual Savings: `$25,000
  - Payback: 0 years
  - 32.77% of the total 505,668 kWh savings
- **VFDs for Pump Motors**
  - Cost: `$84,000
  - Annual Savings: ~$21,000
  - Payback: 4 years
  - 27.15% of the total 505,668 kWh savings
- **Toilet Tank Retrofits**
  - Cost: ~$31,000
  - Annual Savings: ~$10,000
  - Payback: 3.1 years

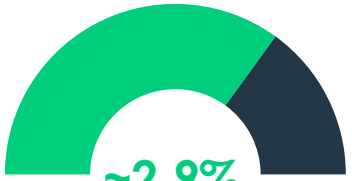
FINANCIAL ANALYSIS / ROI

Capex Breakdown: ~$409,000 (combined projects)

Annual Savings:
- **Utility Cost Savings:** ~$158,000
- **Energy Savings:** 505,668 kWh
- **Water Savings:** 359,505 gallons
- The combined project will reduce the building's carbon footprint by 243 metric tons of CO2 annually

Payback Period: 2.6 years
Simple ROI (return on investment): 38.6%.

IMPACT & BENEFITS



~2.9%
YoY energy reduction
Note: This is a large facility with residential units and a movie theater.

~$158,000
Avoided annual energy cost

2.6 years
Payback period

Intangible Benefits:

- Guest comfort through better control of the HVAC system/thermostats.
- Enhanced comfort and productivity for the kitchen staff due to better air balance and climate control.
- Assists with BPS (Building Performance Standard) Compliance.
- Attracts Eco-Friendly Travelers.

BUILDING THE BUSINESS CASE – ENERGY & WATER SAVINGS ROI

GEOGRAPHIC LOCATION: WASHINGTON, D.C.
CHAIN-SCALE/PROPERTY TYPE: FULL-SERVICE HOTEL
ROOM COUNT: 50-200

Summary: The following energy and water conservation measures were bundled. All financial and energy/water savings are reported as one combined project. This hotel has a Green Key Global certification.

PROJECT DESCRIPTION

The project has the following energy and water conservation measures (ECMs and WCMs):

- **Ultra-High Efficiency Transformers**
  - Cost: ~$99,000
  - Annual Savings: `$24,000
  - Payback: 4 years
- **Toilet Tank Retrofits**
  - Cost: ~$33,000
  - Annual Savings: ~$10,000
  - Payback: 2.7 years

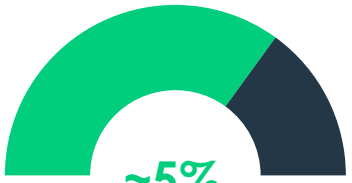
FINANCIAL ANALYSIS / ROI

Capex Breakdown: ~$163,000 (combined projects)

Annual Savings:
- **Utility Cost Savings**: ~$43,000
- **Rebate/Incentives**: $6,090 utility rebate
- **Energy Savings:** 75,354 kWh
- **Water Savings:** 1,101,833 gallons
- The combined project will reduce the building's carbon footprint by 94 metric tons of CO2 annually.

Payback Period: Simple Payback: 3.6 years
Simple ROI (return on investment): 25.7%

IMPACT & BENEFITS



~5%
YoY energy reduction

~$43,000
Avoided annual energy cost

3.8 years
Payback period

Intangible Benefits:

- Enhanced comfort and productivity for the kitchen staff due to better air balance and climate control.
- Assists with BPS (Building Performance Standard) Compliance.
- Attracts Eco-Friendly Travelers.

BUILDING THE BUSINESS CASE – ENERGY & WATER SAVINGS ROI

AHLA RESPONSIBLE STAY

LOCATION: WASHINGTON, DC
CHAIN-SCALE/PROPERTY TYPE: LUXURY HOTEL
ROOM COUNT: 50-200

Summary: The hotel is upgrading their Building Automation System to improve controllability. This leads to energy savings, guest comfort, maintenance efficiency and equipment longevity.

PROJECT DESCRIPTION

The hotel has two centralized building automation systems (BAS). The older system, which is primarily still pneumatic, is dedicated to the east wing. The newer Trend Controls system operates the west wing and the boilers, chillers, pumps, and some meeting space areas. The spa has been removed from the BAS entirely.

This project intent is to migrate the BAS to a single platform, remove pneumatics and replace with digital controls, and reintegrate spa operations.

Energy savings comes from scheduling intermittent use areas such as conference rooms and integrating advanced sequencing including demand control ventilation, outside air enthalpy economization, and Monitoring Based Commissioning (MBCx).

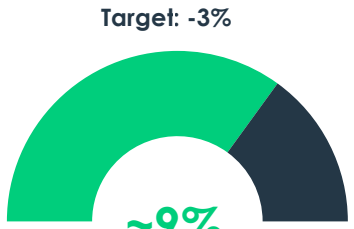
FINANCIAL ANALYSIS / ROI

Capex Breakdown: ~$428,000 (includes equipment and labor)

Annual Savings:
- **Utility Cost Savings:** ~$165,000
- **Energy Savings:** 1,025,000 kWh
- **Rebates/Incentives:** $34,300

Payback Period: 2.2 years
ROI (return on investment): 46%

IMPACT & BENEFITS



YoY energy reduction

~$165,000
Avoided annual energy cost

2.2 years
Payback period

Intangible Benefits:

Reduced energy consumption helps the building achieve compliance with Washington DC's Building Energy Performance Standard (BEPS) target of 54 Energy Star Score. The building is currently on track to achieve compliance in 2026.

Improved HVAC operations also:
- Improves guest comfort
- Increases maintenance efficiency
- extends equipment life

BUILDING THE BUSINESS CASE – ENERGY & WATER SAVINGS ROI

LOCATION: WASHINGTON, DC
CHAIN SCALE/PROPERTY TYPE: UPPER UPSCALE BOUTIQUE HOTEL
ROOM COUNT: 50-200

Summary: Vendor retrofitted internal components of all toilets to reduce water usage.

PROJECT DESCRIPTION

Vendor retrofitted the internal components of all 146 toilets in the building to reduce water usage and water bill.

- Initial walkthrough was conducted to ascertain the replacement parts were compatible with all 146 toilets in the building
- The existing internal components were replaced with high-efficiency fill valves, flush valves, flappers, handles, bolts and supply lines
- These high-efficiency parts reduced the gallons of water per flush and prevented leaks and potential floods
- Water savings from 1.6 gallons per flush to under a gallon per flush.
- The high-efficiency parts ensure that water is not wasted when there is a problem with the toilet. Rather than continuously run, it will detect that there is an issue and tank will stop refilling, resulting in water savings.

FINANCIAL ANALYSIS / ROI

Capex Breakdown: $24,000 (includes parts and installation)

Projected Savings:
- **Utility Cost Savings:** $24,000
- **Water Savings:** 88.7 gallons of water per flush

Payback Period: 11 months

IMPACT & BENEFITS



Unknown
YoY water reduction

~$24,000
Avoided annual energy cost

11 months
Payback period

Intangible Benefits:

Labor savings resulted place once everything was in place; less labor calls for toilet issue.