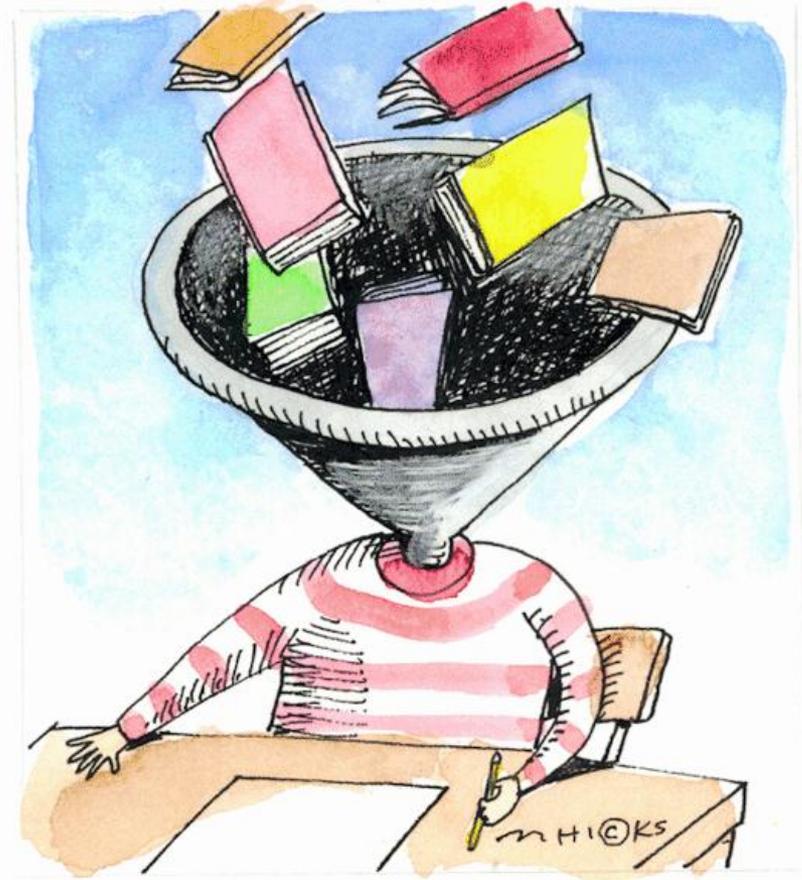


Green Hotel Renovations

Craig Nicholson, LEED AP BD&C
Director of Sustainable Development
AJAX Consulting Services, Inc.



Biology
Chemistry
Environmental Science
Urban Planning
Environmental Policy
Economics
Hospitality...



BUILDING ANATOMY

Skeleton

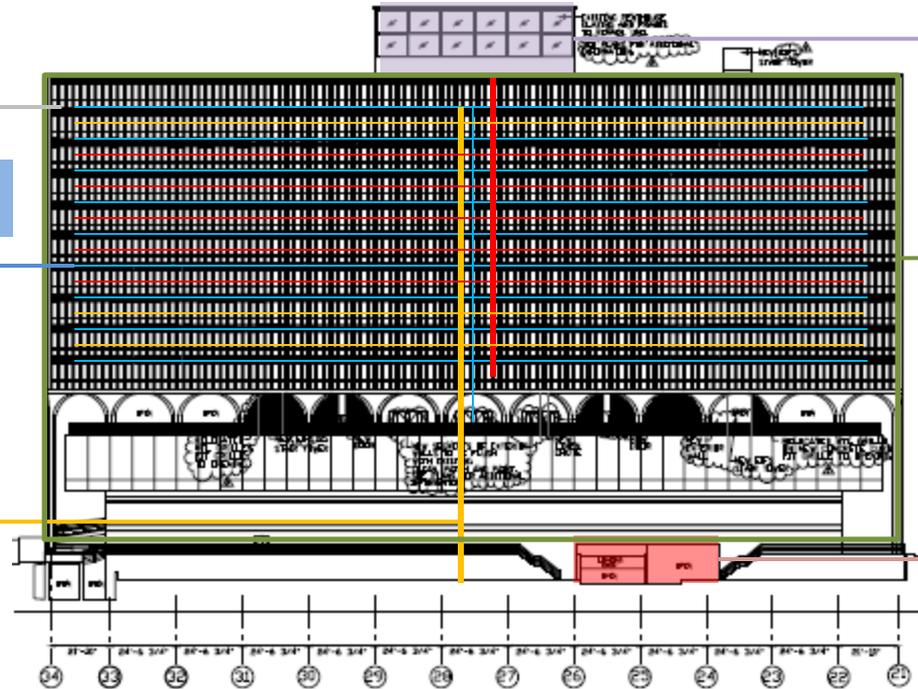
Respiratory System/Lungs

Pulmonary System

Skin

Excretory System

Brain/Nervous System



PEAK LOADS IN HOTELS

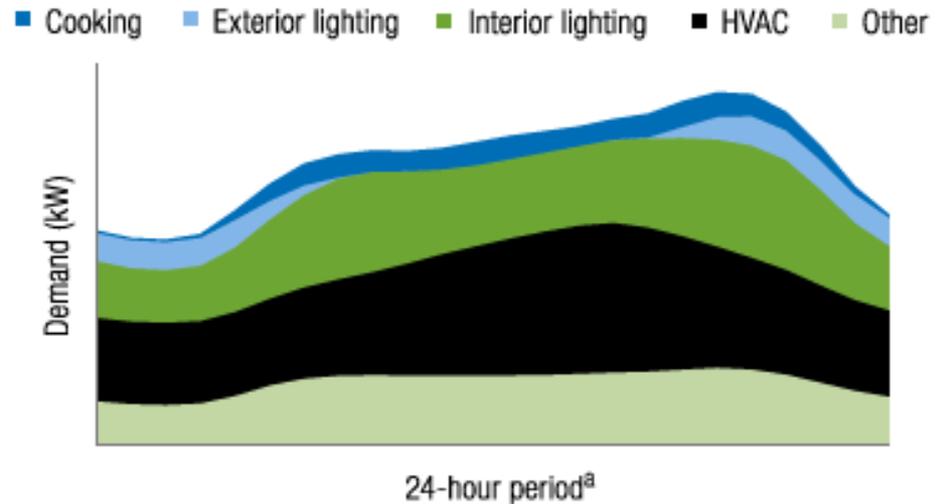
Guest Occupancy

- Heating/Cooling
- Lighting
- Plug Loads

Conferences

- Body Mass Factor
- A/V Equipment Loads

Dining/Restaurants



Notes: kW = kilowatt.

a. 24-hour period = midnight to midnight.

© E Source; data from ITRON

PEAK PERFORMANCE

If we think of buildings as living systems, how can we design buildings that operate at peak performance during peak demand?



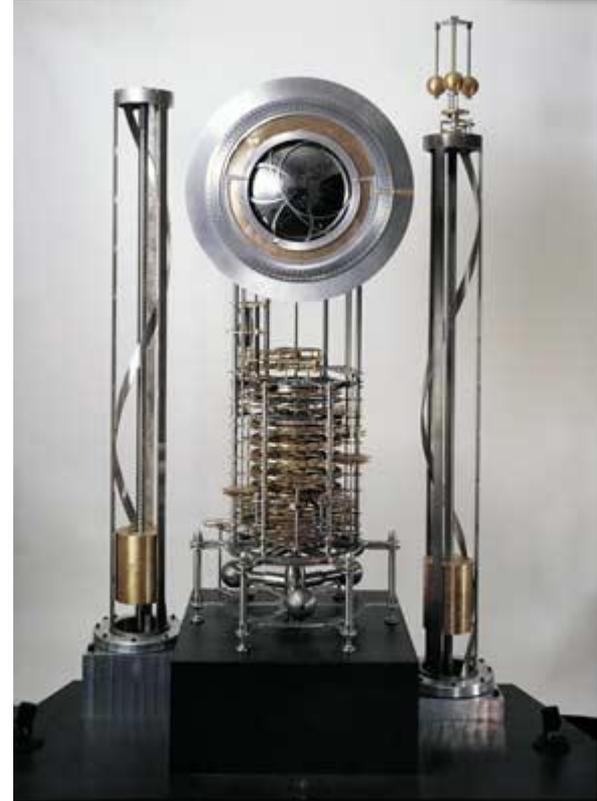
SHORT TERM SOLUTIONS

- **Back of House areas**
- **Laundry**
- **Pools & Hot Tubs**
- **Housekeeping procedures**
- **Kitchen and Food Prep**
- **Public restrooms**
- **Guest service options & Choose to Conserve Programs**



LONGER TERM SOLUTIONS

- **Commissioning & Retro-Commissioning**
- **Daylighting**
- **Compact Fluorescents**
- **LED's**
- **Lighting control**
- **Water heating**
- **Building Envelope**
- **HVAC**
 - **Ventilation Control**
 - **Energy Management**



HAVING THE RIGHT TEAM IS KEY TO SUCCESS!

- Owner
- Operator (GM, Engineering Staff, Green Team, etc.)
- Interior designer
- Architect
- Owner's Rep/Project Manager
- Engineers & Consultants
 - Mechanical
 - Electrical
 - Lighting
 - AV
- General Contractor
- Purchasing Agent



CRITICAL COMPONENTS

- Energy Efficiency

- Install high-efficiency heating and cooling equipment
- Install high-efficiency lights and appliances

- Water Conservation

- Install water-efficient equipment

- Indoor Air Quality

- Use low VOC finishes and adhesives
- Properly commission air handling equipment
- Thermal comfort
- Lighting Control

- Materials

- Utilize sustainably harvested wood
- Utilize rapidly renewable materials
- Use durable products and materials
- Buy locally
- Reuse and Recycle



Weckerungel, Mathis and William Rees. "Our Ecological Footprint: Reducing Human Impact on the Earth," 1996.

Case Studies

“Action expresses priorities.”
-Gandhi

THE WESTIN – COPLEY PLACE

Working alongside the Westin Staff, we continue to pursue options for increasing the energy efficiency, conservation of water, and the careful selection of building materials that are durable and sustainable.



WESTIN COPLEY – HIGHLIGHTS

Scope of Work: Meeting Rooms, Ballrooms, Bar 10 and 10H and Guestroom Renovation (803 Keys)

Sustainable Design Features (Conference Facilities):

- Lighting

- Converted previous incandescent and halogen lighting to compact fluorescent

- Utilizing LEDs to replace MR16s in Public Areas

- Acoustical Ceiling Tile contains recycled product

- Energy Efficiency

- Installation of window film to reduce solar heat gain

- Occupancy sensors for HVAC and lighting controls

- Regional Materials

- Water efficient fixtures

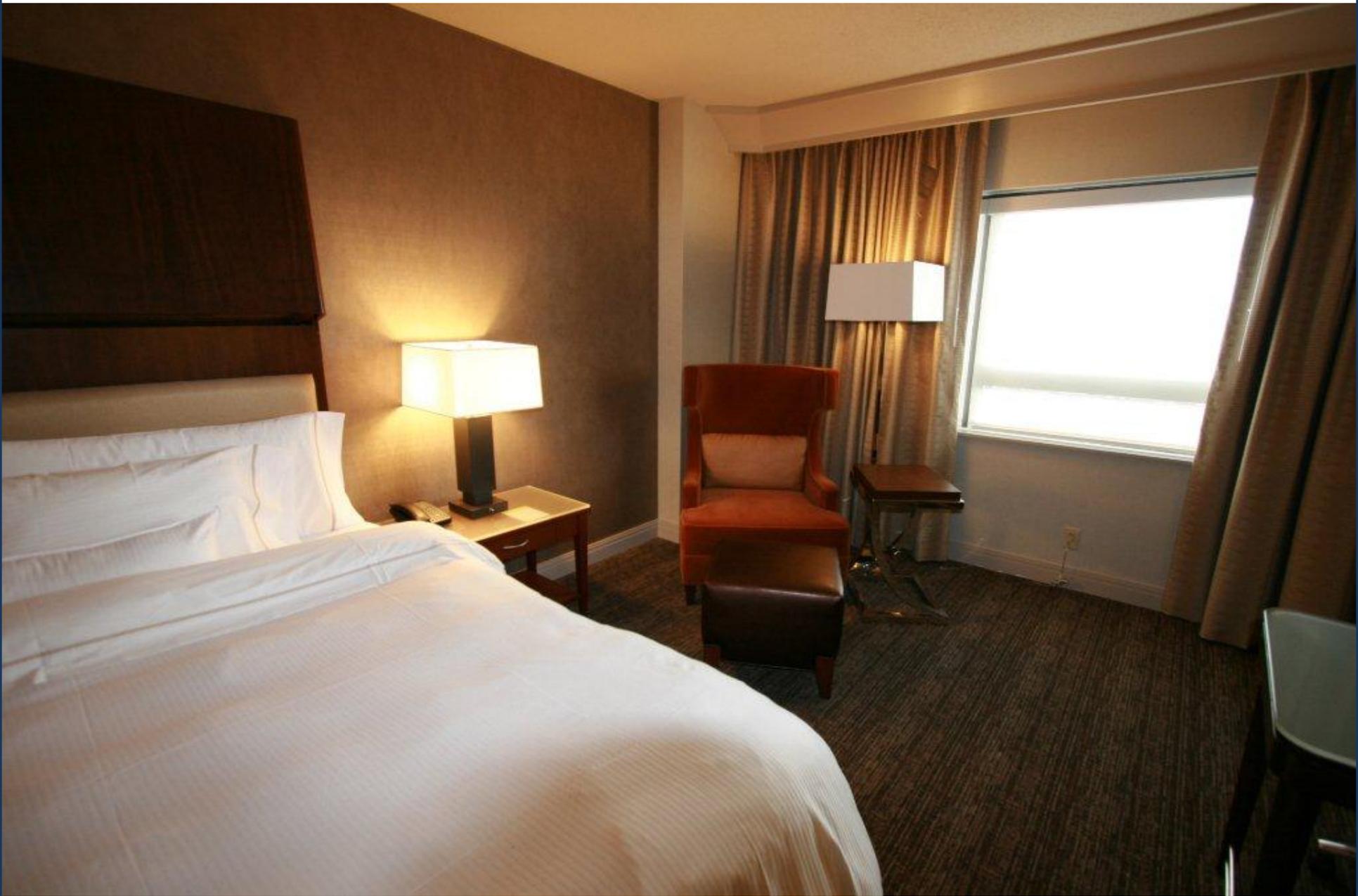
- Installed waterless urinals in public restroom



ENERGY CONSERVATION AND EFFICIENCY

The Renovation Team has implemented energy efficient materials and equipment resulting in substantial conservation:

- LED Lighting
- Kitchen Hood System Management
- Automated Combustion Controls
- Occupancy Sensors
- Variable Speed Drives
- Direct Digital Controls
- Compact Florescent Lighting



WASTE DIVERSION

During our renovation over 550 tons of waste were created, of which 501 tons were diverted from landfill.

This constitutes an amazing diversion rate of:

91.04%

SUSTAINABLE FEATURES

- High efficiency lighting via compact fluorescent lamping in all fixtures and LED lighting at the headboard
- High efficiency toilets
- Low-flow shower heads
- Solar shades for energy efficiency and greater comfort
- Low VOC paints
- Recycled/green backing for all vinyl wall coverings
- “Green Label Plus” guestroom & corridor carpet (CRI)
- Carpet pad meets LEED requirements
- Headboard fabric = 66% recycled content
- Entry wood floor = post-industrial recycled wood fiber

LED exit signs
saving 65,000 kWh

Guestroom/Corridor CFLs
saving 125,000 kWh

Adjustable Speed Drives for
Chilled water pumps, ballroom
supply fans, return fans, and
toilet exhaust fans

Guestroom and public
space LED's saving 15,000 kWh



VFDs on domestic
water pumps
Saving 135,000 kWh

CO2 Sensors for CO2 based
demand controlled ventilation

VFDs on kitchen exhaust hoods
saving 35,000 kWh

Refrigeration Controls for walk-
in coolers & freezers

Total Savings of Completed Measures: 15.7%

Savings of Proposed Measures: 7 to 8%

In December of 2010,
The Westin Copley Place
earned the prestigious
honor of becoming an
“Energy Star”
labeled facility.



HOTEL SAX - CHICAGO



Images Courtesy of Hotel Sax

HOTEL SAX - CHICAGO

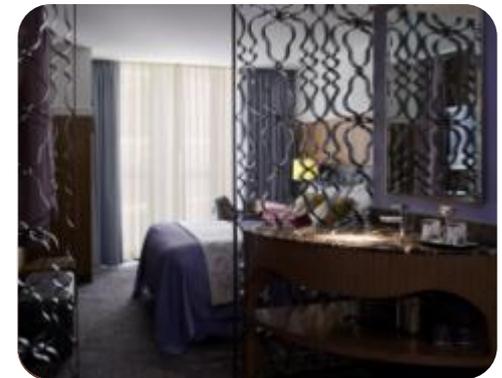


Images Courtesy of Hotel Sax

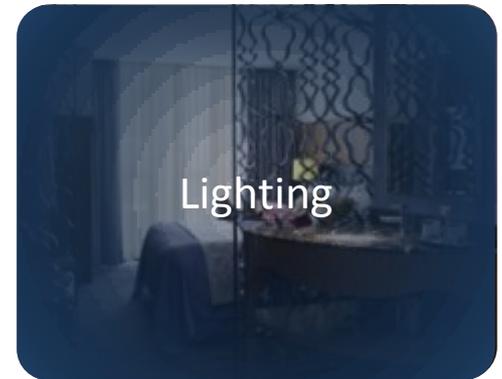
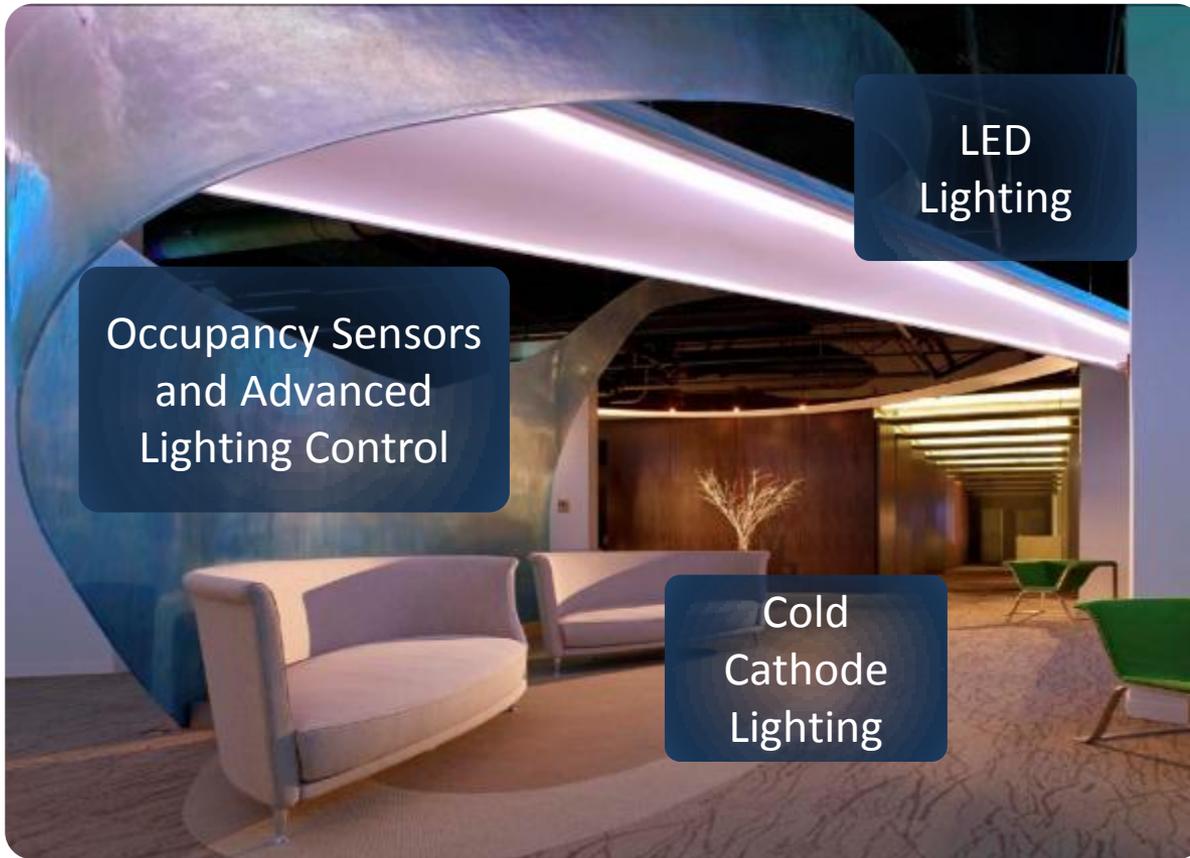
HOTEL SAX - CHICAGO



Images Courtesy of Hotel Sax



HOTEL SAX - CHICAGO



Images Courtesy of Hotel Sax

HOTEL SAX - CHICAGO



Images Courtesy of Hotel Sax

HOTEL SAX - CHICAGO



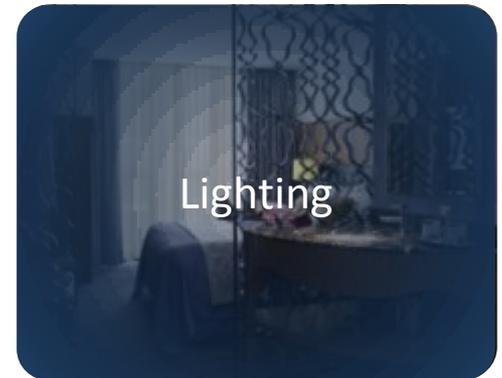
Reconstituted
Wood Veneers

Low Flow
Showerheads
and Faucets

Efficient
Lighting



Materials



Lighting

Images Courtesy of Hotel Sax

HOTEL SAX – ADDITIONAL PROJECT HIGHLIGHTS

Energy Economizers on Kitchen Equipment

Low flow faucets, Touchless Faucets, and Water Conserving Toilets

Occupancy Sensors in back of house areas and restrooms

Energy Star rated TVs

Going Forward:

Evaluating LED replacements for Approximately 450 MR-16's
(2 Year Simple Payback)

Implementation of Sebasta Blomberg Recommendations:

- VFDs on HVAC Equipment

- Occupancy Sensors in Guestrooms

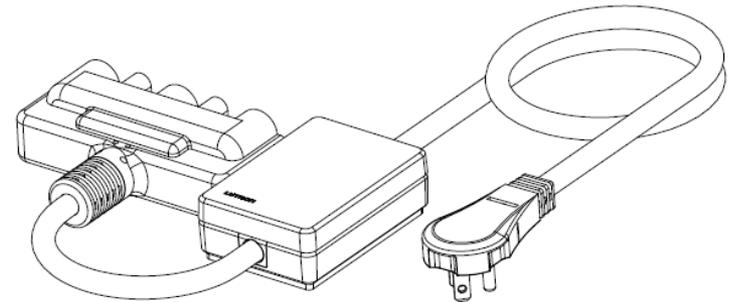
Best Practices

“Learn from the birds what food the thickets yield;
Learn from the beasts the physic of the field;
The arts of building from the bee receive;
Learn of the mole to plow, the worm to weave.”
-Alexander Pope

RETROFITS IN EXISTING HOTELS

Lighting:

- **Wireless Occupancy Sensors**
- **Plug-In Appliance Modules**
- **Daylight Sensors**



RETROFITS IN EXISTING HOTELS

Heating/Cooling:

- **T-Stats with Occ. Sensors**
- **Building Automation Systems**
- **Smart rooms – tied to reservation system**



RETROFITS IN EXISTING HOTELS

Building Envelope:

- Façade inspections
- Replacement windows
- Insulation



Zero Net Energy Hotels – Are They Possible?



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