BOSTON GREEN TOURISM

Reducing Natural Gas Usage

EcoGreen Hotel

delivering proven technologies

in a Vendor-Neutral Approach

Contact Us: 888.229.0213
GHofstetter@EcoGreenHotel.com
Who is EcoGreen Hotel

✓ What we do.....

✓ Identify sustainable and energy efficient strategies reducing a property’s usage, cost and overall environmental impact

✓ Vendor-Neutral approach delivering the best quality and value to our clients

✓ We specialize in identifying and taking advantage of incentives, grants, rebates and loan programs
Our Core Efficiencies

✓ Core Business | Hotel Sustainability

✓ Energy Efficiency Analysis (E2A)
✓ New Build Analysis (NBA)
✓ Lighting Analysis (LDA)
✓ Utility Monitoring (UM)
✓ Annual Site Visits (ASV)
✓ SBA 504 Green Loan Administration (SBA)
✓ Energy Star Benchmarking
✓ Project Management | Deployment
Natural Gas Reduction

☑ More than many other facility types, water heat is a major load for hotels!

☑ It accounts for over 30% of the hotels energy consumption.
Natural Gas Reduction

Most of the electricity consumed by hotels and motels is used for space cooling and lighting. Typically, space heating represents the largest use of natural gas in hotels and motels. However, each facility’s energy profile is different, so these charts are not representative of all lodging facilities. Hotel and motel energy use will also vary depending on the types of amenities available.

![Electricity usage chart]

- Water heating: 5%
- Cooking: 2%
- Refrigeration: 6%
- Ventilation: 7%
- Office equipment: 7%
- Space heating: 11%
- Lighting: 23%
- Cooling: 27%
- Other: 13%

![Natural gas usage chart]

- Space heating: 55%
- Water heating: 31%
- Other: 5%
- Cooking: 9%

Courtesy: E source; from Commercial Building Energy Consumption Survey, 1999 data
Natural Gas Reduction

✓ Key Areas

✓ Boilers  |  Temps, Burn Time, Circulation

✓ Laundry  |  Alternative Cleaning Methods

✓ Guest Rooms  |  Water Reduction

✓ Pool / Spas  |  Temp Settings, Solar Options

✓ Renewable Energy Sources  |  Incentive Driven
Natural Gas Reduction

✓ Key Areas

✓ Boilers

✓ Pipe Insulation

✓ Retrofitting existing equipment

✓ Circulation Controls

✓ Set Points | Mixing Valve

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Natural Gas Reduction

✓ The Computerized Hot Water Control System consists of a single digital electronic device using a microprocessor to calculate fuel savings by adjusting the burner run pattern to match the system’s “heat load.”

✓ The controller accomplishes this by monitoring both the boiler out-flow water temperature, as well as, the rate at which that temperature is changing.

- Consists of a sensing device to optimize boiler heating operation
- Extends boiler "off-times" = results in longer, more efficient burn cycles and reduced burner wear & tear
- It functions like how digital fuel injection works in automobiles – Computer control calculates the most optimal fuel utilization pattern
Natural Gas Reduction

Energy wasting!

Legend
A. Boiler Energy Cost Management System
B. Hot Water Flow Sensor
C. High speed recirculation pump
D. Hot water lateral
E. Boiler or commercial water heater
F. Storage tank
G. Hot water recirculation line
H. Standard recirculation pump
I. Cold water make-up line
J. Last point where hot water is needed

Direction of water flow
Red glow indicates the presence of hot water

Figure 1A: Hot water recirculation line running full time.

Uses 25% less energy!

Note: The hot water circulation lines above are always filled with hot water. The heat is lost as the water moves through the building and the water must be reheated over and over again.

With the BECMS in place the pipes only have hot water when there is a demand.

Figure 1B: Hot water recirculation line running in energy conservation mode.

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Jurys Doyle Hotel Group spent $45,000 on an Ozone System at its ENERGY STAR labeled Boston Facility. It allows cooler water to be used, shorter wash cycles and cut detergent usage by 30% resulting in 16 month payback.
Natural Gas Reduction

Hampton Inn, Lenoir City, TN | 77 Rooms
- Ozone Laundry December 2010
- Hot Water Circulation Control November 2011

<table>
<thead>
<tr>
<th>Natural Gas Usage (CCF)</th>
<th>Usage POR</th>
<th>Cost ($)</th>
<th>% Change Y to Y</th>
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<tbody>
<tr>
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<td>472</td>
<td>621</td>
<td>458</td>
</tr>
<tr>
<td>Feb</td>
<td>589</td>
<td>593</td>
<td>366</td>
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<tr>
<td>Mar</td>
<td>405</td>
<td>643</td>
<td>251</td>
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<tr>
<td>Apr</td>
<td>344</td>
<td>360</td>
<td>275</td>
</tr>
<tr>
<td>May</td>
<td>226</td>
<td>214</td>
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<td>Jun</td>
<td>186</td>
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<td>Aug</td>
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<tr>
<td>Oct</td>
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<td>176</td>
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<tr>
<td>Nov</td>
<td>255</td>
<td>302</td>
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</tr>
<tr>
<td>Dec</td>
<td>409</td>
<td>340</td>
<td>183</td>
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Total: 3,550 3,998 2,946 888 0.1767 0.1944 0.1444 0.0997 4,646 4,745 3,311 955 10.74% -15.87% -37.32%
Natural Gas Reduction

Key Areas

- Guest Rooms
- Showerheads
- Aerators
Natural Gas Reduction

✓ Key Areas

✓ Pool / Spas (Heat Pump vs. Gas Heater)

✓ Set Point Management

✓ Circulation | Turn over

✓ Liquid Pool Covers

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Natural Gas Reduction

- Liquid Pool Cover
- Best barrier to slow heat & water loss

Without Heatsavr

With Heatsavr, 15 minutes later
## Natural Gas Reduction

**Hampton Inn, Knoxville TN | 92 Rooms**

- **Ozone Laundry - July 2010**
- **Hot Water Circulation Control - February 2011**
- **HeatSavr Liquid Pool Blanket – February 2011**
- **Inteldedyn Boiler Economizers - May 2011**

<table>
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<tr>
<th>Natural Gas Usage (Therm)</th>
<th>Usage POR</th>
<th>Cost ($)</th>
<th>% Change Y to Y</th>
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<tr>
<td>Dec</td>
<td>1,330</td>
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Total: 14,919 | 14,385 | 9,559 | 0.8839 | 0.7698 | 0.4919 | 18,807 | 16,666 | 10,750 | -15.06% | -35.61%
Natural Gas Reduction

✓ Key Areas

✓ Renewable Energy Sources

✓ DHW – Solar Thermal (Flat Plate | Evacuated Tube)

✓ Pool – Solar Thermal (Polymer Collectors | Glazed)

✓ Dual System – Heat Exchanger
Solar Thermal

Solar collector panels containing a heat transfer fluid are installed on the roof at a favorable angle to the sun.

Pipes lead from the panels to the hot water tank, where the heat is transferred to provide tremendous amounts of hot water.

Even in winter, hot water temperatures can reach 180°. Solar hot water systems are usually designed to provide 80% of the processes overall hot water needs over the course of a year.
Natural Gas Reduction

✓ Summary….  

✓ Many areas exist for reduction in natural gas. Each property’s “lowest hanging” fruit is different as operational solutions exist outside capital ones.
Client, Partner focused Relationships

- Energy Conservations Measures (ECM’s)
  - Proven Technologies

- Primary Focus
  - YOUR Energy Reduction

- Significant Energy Savings | Strong Return | Measurement

Partnering To Achieve Your Sustainability Goals, Today!
Thank you,

Your SUSTAINABLE Team!

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