Global Energy Management System Implementation: Case Study

United States of America

JW Marriott
Washington DC

Rehearsal # 5. We care for our Hotel, Our Community and the Environment

Business Case for Energy Management

1.1. Organization Profile/Business Case:

Marriott International (MI):

Marriott International, Inc. is a leading global lodging company with more than 6,000 properties in 122 countries and territories, reporting revenues of more than $17 billion in fiscal year 2016. Founded by J. Willard and Alice Marriott and guided by family leadership for nearly 90 years, the company is headquartered outside of Washington, D.C. in Bethesda, Maryland.

JW Marriott Hotel, Washington DC:

The JW Marriott Washington DC is a luxury downtown Washington, DC hotel located on Pennsylvania Avenue. Situated near some of the most recognizable landmarks in Washington, DC, this hotel provides easy access to renowned monuments, the National Mall, museums, and other cultural venues around the city. Additionally, the JW Marriott hotel is conveniently located around the corner from the White House, one block from the Metro and 15 minutes from Reagan National Airport. We offer 29 meeting rooms and 37,000 square feet of total meeting space, making it a premier meeting facility in the area. All of our 777 luxurious rooms and suites are equipped with high-speed Internet access and HDTVs. The excellent location and amenities at this downtown hotel in Washington, DC make it the ideal choice for business and leisure travelers alike.

Energy Management:

Motivations for energy and climate sustainability efforts:

To support corporate energy goal and to rehearse our Commitment to our community and environment, JW Marriott Washington DC sets energy reduction goal each year to achieve our corporate long term energy reduction target. Energy reduction goal became part of our Top Management commitment and our annual leadership performance evaluation process. Above requirement motivated us to outperform from our routine. Marriott International Energy team has implemented various energy conservation best practices such as, Signature Energy reduction project per hotel per year, quarterly Energy and Environment Action Plan process, minimum one ROI Energy improvement project budgeted per year in our ten year Capital Expenditure budget planning, etc. However, Implementing ISO 50001 and 50021 Superior Energy Performance Certification helped us to merge Marriott energy conservation best practices along with ISO 50001 standard expectation to establish robust process and communication pathway to hold ourselves accountable to consistently deliver results by using Plan, Do Check and Act. ISO 50001 internal and external audit process has created energy awareness and commitment to excel by our hotel associates.
Reduce Environmental Impacts:
We minimize our footprint by sustainably managing our energy and water use, reducing our waste and carbon emissions and increasing the use of renewable energy. We employ innovative technologies to plan, implement, track and communicate how we operate responsibly to mitigate climate-related risk, benefitting our business and the communities we serve.

MI Energy Reduction Impact from past Initiatives:
In 2016 (against 2007 baseline and first-generation Goals for Marriott Rewards and The Ritz-Carlton Rewards hotels):
• Reduced our energy intensity by 13.2%
• Reduced our water intensity by 7.7%
• Reduced our GHG emissions intensity by 15.8%

MI Sustainability Certification GOAL:
100% of Marriott International hotels will have a sustainability certification, and 650 hotels will pursue LEED certification or equivalent by 2025

Sustainability Certifications:
» By 2025, 100% of hotels will be certified to a recognized sustainability standard

MI Environmental GOAL:
Reduce environmental footprint by 15% | 30% | 45% across the Portfolio by 2025 (from a 2016 baseline; for water/carbon/waste on an intensity basis)

Water: Reduce water intensity by 15%
Carbon: Reduce carbon intensity by 30%
» Commit to analyze the opportunity to set a science-based target by 2018
Waste: Reduce waste to landfill by 45%. Reduce food waste by 50%
Renewable energy: Achieve a minimum of 30% renewable energy use

“Implementing ISO 50001 has been valuable, including increasing employee awareness of energy issues and the benefit of behavioral changes to support energy management and helping the hotel develop achievable energy performance targets,”—Raj Srinivasan, DOE

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<th>Case Study Snapshot</th>
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<td><strong>Industry</strong></td>
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<td><strong>Product/Service</strong></td>
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<tr>
<td><strong>Location</strong></td>
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<tr>
<td><strong>Energy Management System</strong></td>
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<td><strong>Energy Performance Improvement Period</strong></td>
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<tr>
<td><strong>Energy Performance Improvement (%) over improvement period</strong></td>
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<td><strong>Total energy cost savings over improvement period</strong></td>
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<tr>
<td><strong>Cost to implement EnMS</strong></td>
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<td><strong>Payback period (years) on EnMS implementation</strong></td>
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<tr>
<td><strong>Total Energy Savings over improvement period</strong></td>
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<td><strong>Total CO2-e emission reduction over improvement period</strong></td>
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**Business Benefits Achieved**
Implementing Energy Management System and Energy improvement projects at the JW Marriott, DC helped to reduce our energy usage by 16.5% over three consecutive years. It helped us to reduce CO2 emission...
by 4,136 MT which supports our corporate carbon reduction goal and to achieve Platinum level Superior Energy Performance certificate in 2016. We were the first Marriott Hotel to accomplish SEP certification. Our customer sees that we are an environmental friendly hotel and they intent to recommend and come back to our Hotel. EnMS process helped us to meet corporate/Government group’s RFP with Environment survey expectation to conduct business with us. In addition, our hotel associates highly engaged towards energy conservation efforts due to the communication and awareness campaign through EnMS implementation.

EnMS Development and Implementation

Organizational:

Marriott International has implemented robust energy awareness and reduction process in each of its Hotel and the Top Management at the JW Marriott, DC hotel has elevated our commitment by developing energy action committee involving each department key representatives to carefully review all available energy improvement opportunities and support implementing ISO 50001 EnMS. We were the first hotel in the US to achieve ISO 50001 in 2013. We have received recertification of ISO 50001 in 2016 and also upgraded to ISO 50021 Superior Energy performance Platinum Certification.

Energy Review, Planning, and Energy Improvement:

Top management annually reviews EnMS Objectives and Targets, plans and actions, energy usage trend, Monthly energy usage analysis report developed by ECOVA (External Utility bill usage and cost audit and analysis services) to understand where the energy being used the most, focus on significant energy usage equipment operation and procedures, internal and internal audit feedbacks. Top Management sets each year energy goal based on year over year improvements and implementation of Energy ROI projects. Yearend energy usage summery report is used to determine whether energy performance is improved.
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2017 Energy Management Action Plan

<table>
<thead>
<tr>
<th>Objective:</th>
<th>Reduce energy consumption in 2017</th>
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<tbody>
<tr>
<td>Target:</td>
<td>Reduce electric use by 0.25% compared to YTD actual 2016</td>
</tr>
<tr>
<td>Original Issue Date:</td>
<td>02/23/2017</td>
</tr>
<tr>
<td>Revision Date(s):</td>
<td>02/24/2017</td>
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Energy Management Project:
- Implement Associate Caterina LED light upgrade to reduce Electric consumption by 10/31/2017
- Implement Back of the House (BOH) LED light upgrade to reduce Electric Consumption by 12/31/2017
- Continued Commissioning of chilled water production system by implementing chilled water diagnostic tool to reduce kwH by 06/30/2017

EEC team to meet quarterly to drive behavior change in the hotel to conserve energy – EEC to attend department meetings.

2017 Energy Objectives and Targets Worksheet

<table>
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<tr>
<th>Objective:</th>
<th>Reduce energy consumption</th>
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<tr>
<td>Date:</td>
<td>02/24/2017</td>
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| Target 1: | Reduce Electric consumption by 23721 KWH (0.25% from 2016) by 12/31/2017 |
| Target #1a | Implement Associate Caterina LED light upgrade to reduce Electric consumption by 05/03/2017 |
| Target #1b | Implement Back of the House (BOH) LED light upgrade to reduce Electric consumption by 06/30/2017 |
| Target 2: | Continued Commissioning of chilled water production system implementing chilled water diagnostic tool to reduce kwH by 06/30/2017 |
| Target 3: | EEC team meet quarterly to drive behavior change in the hotel to conserve energy – EEC to attend department meetings |

Considerations

Daily utility meter readings are taken to narrow down the focus of where the energy is saved or exceeded.

EnMS took about six months to be more effective from developing the Energy Manual based on EnMS expectation with property specific details and process to establish successful system.
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Cost Benefits:

Our energy usage reduced by 16.5% over three consecutive years which is a reduction of CO2 emission by 4,136 MT. Energy saving helped to improve profit margin. Total cost to implement EnMS system was about $32.5K. However there are additional Capital Expenditure energy ROI projects were implemented to achieve above energy reduction. EnMS process helped to identify areas where energy improvements can be accomplished.

<table>
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<tr>
<th>Initial Cost to develop and implement the EnMS</th>
<th>Initial cost to prepare for external audit</th>
<th>Additional monitoring and reporting equipment installed to meet EnMS requirements</th>
<th>Third party audit costs for three years</th>
<th>Technical assistance (e.g. hired consultants to assist with EnMS implementation)</th>
<th>Other (e.g. internal communications)</th>
<th>Total</th>
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<tr>
<td>1900</td>
<td>200</td>
<td>200</td>
<td>1800</td>
<td>5</td>
<td>120</td>
<td>5000</td>
</tr>
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Validating Results:

Monthly Energy critique meetings are conducted between the General Manager, Director of Finance and Director of Engineering to review energy usage vs. energy goal and validate energy savings based ROI project and process implementation and take corrective actions if targets are not met.

Operational Control and Sustain improvement:

Hotel guest becomes first priority in our industry. Our hotel has developed an energy policy that keeps guest comfort and safety into consideration while implementing energy conservation efforts. It made it clear to our hotel associates that energy conservation is not a compromise of guest priority. Thus, our associate finds every possible opportunity as part of their daily routine to patriciate in energy conservation efforts. Trainings are provided for setting room temperature based on weather pattern, educating kitchen associates of turning off gas burners when not in use are become routine to energy management committee. Hotel has put together a nice two page energy action item flier for associate’s reference tool which became part of their day to day operation.

Tools and resources:

Marriott International Energy team has developed various energy measurements, monitoring and reporting tools to support hotels success. JW Marriott Hotel has developed Energy Manual that details about all available tools and resources for successful implementation of EnMS. Our third party service provider ECOVA’s website offers all historical energy usage data and analysis which can be found online to review and compare with similar Marriott hotels to
benchmark energy usage. Building automation system offers trends to analyze significant energy usage equipment performance and energy efficiency.

Best practices, Training and Communication:

Top Management created hotel wide energy awareness via communication boards, celebrating Earth Day and conducting Energy awareness posters competition which helped our associate’s behavior change towards energy conservation. Energy Management Team has been trained onsite and via webinar on EnMS implementation and internal audit process by Georgia Tech Energy Audit experts. Hotel Associates have been trained about EnMS during all associate meetings and engineers are regularly trained on new equipment and technology to better manage significant energy usage equipment.

“Our customers appreciate efforts made in this hotel and we are actually able to gain business over our competitors in being socially responsible and very effective energy conservation in place”

—Satinder Palta, General Manager

Lessons Learned

Finding time in a busy operating hotel is always challenging especially to implement EnMS system. It has to be a commitment from Top Management and make rest of the organization to believe that it’s possible to implement EnMS with a good plan and support. Use existing resources provided by Marriott International Energy team and merge it with ISO 50001 standard expectation to save time and effort. Hotel has developed an Energy manual that helps other Marriott hotels to easily adopt EnMS.

Keys to Success

- Don’t give up
- Take external help when needed
- Delegate responsibility and hold people accountable
- Follow Energy Management Plan thoroughly
- Over Communicate to create awareness and involve stack holders

https://youtu.be/is1pfTj0XzE

Through the Energy Management Working Group (EMWG), government officials worldwide share best practices and leverage their collective knowledge and experience to create high-impact national programs that accelerate the use of energy management systems in industry and commercial buildings. The EMWG was launched in 2010 by the Clean Energy Ministerial (CEM) and International Partnership for Energy Efficiency Cooperation (IPEEC).

For more information, please visit www.cleanenergyministerial.org/energymanagement.