

# ISO 50001 Energy Management System Case Study

2021

U.S.A.

## JW MARRIOTT

*JW Marriott Washington, DC*



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

### Organization Profile & Business Case

#### Marriott International (MI):

Marriott International, Inc. is a leading global lodging company with 7,800 properties in 138 countries and territories, reporting revenues of more than \$20.97 billion in fiscal year 2019. Founded by J. Willard and Alice Marriott and guided by family leadership for more than 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, and world

class museums. 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. Our 777 luxurious rooms and suites are equipped with high-speed Internet access and HDTVs. Additionally, we offer 29 meeting rooms and 37,000 square feet of meeting space, making it a premier meeting facility in the area. The location and amenities at our downtown hotel in Washington, DC make it the ideal choice for business and leisure travelers alike.

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 Certified Partner Certification at approximately the same time.

#### Case Study Snapshot

Industry	Commercial Building
Product/Service	Hospitality
Location	Washington DC
Energy management system	SEP 50001
Energy performance improvement period, in years	3 YEARS
3 Year Energy Performance Improvement (%) over improvement period	7.8%
Total energy cost savings over improvement period	\$221,551
Cost to implement EnMS	\$30,000
Total Energy Savings over improvement period	9502 (GJ)
Total CO <sub>2</sub> -e emission reduction over improvement period	725 (Metric tons)

**Business Case:**

The JW Marriott Washington DC focuses on improving our overall sustainability for three main reasons: 1) to reinforce our commitment to be good stewards of the environment while also reducing costs; 2) to differentiate ourselves from other competitive hotels when bidding on business; and 3) to support MI's corporate energy goals. In this effort, among others that the JW Marriott Washington DC is pursuing, the hotel focused on energy reduction as it is a measurable goal which the entirety of the hotel can impact based on their actions. Given its financial and non-financial benefits, it has been easy to gather internal and external support for the project. It is viewed as an extension of our first SEP certification as this is the 2<sup>nd</sup> time we have achieved certification for energy reduction.

To promote the effort, JW Marriott Washington DC sets an energy reduction goal each year to achieve our long-term energy reduction target. This annual energy reduction goal becomes part of our top management priorities and is incorporated into our annual leadership performance evaluation process. To meet the goals and our commitment to sustainability, we are motivated to outperform our annual goals.

To support the individual hotel efforts, the Marriott International Energy team has implemented various energy conservation best practices, such as the Signature Energy reduction project, quarterly Energy and Environment Action Plan process, required annual ROI Energy improvement projects, etc. Implementing SEP 50001 Certification helped us to merge Marriott energy conservation best practices and ISO 50001 standard expectations to establish robust processes and communication pathways. It ensures that we hold ourselves accountable to consistently deliver results by using the Plan, Do Check and Act process. Additionally, the SEP 50001 internal and external audit process has created energy awareness and commitment to our goals that has permeated all levels of associates at our hotel.

**MI Sustainability Goals:**

MI has several goals it aims to achieve across its hotels by 2025:

- 100% of Marriott International hotels will have a sustainability certification, and 650 hotels will pursue LEED certification or equivalent
- Water: Reduce water intensity by 15%
- Carbon: Reduce carbon intensity by 30%
- Waste: Reduce waste to landfill by 45%. Reduce food waste by 50%
- Renewable energy: Achieve a minimum of 30% renewable energy use

The JW Marriott Washington DC has implemented projects to meet or exceed these goals. Energy management and SEP certification has been integral in getting support for these additional efforts.

***“Marriott International has a corporate goal to reduce the environmental footprint, Water Intensity by 15% | Carbon Intensity by 30% | Waste to landfill by 45% across the Portfolio by 2025 and achieve a minimum of 30% renewable energy use. At the JW Marriott Washington, DC, SEP 50001 and ISO 50001 are important tools to help reach these 2025 targets.”***

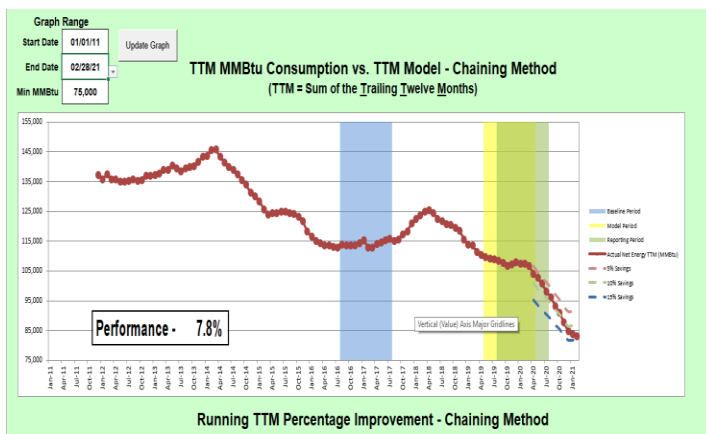
—Tushaar Agrawal, General Manager, JW Marriott Washington, DC

**Business Benefits**

With our second SEP 50001 implementation and certification, we have maintained the momentum and hotel-wide focus on energy conservation and sustainability overall. Substantial benefits have manifested themselves in the following ways: i) reduced our energy usage by 7.8% (9502 GJ of energy savings) over the past three consecutive years and reduced costs by \$221,551 over those years with minimal additional investment (Exhibit A); ii) reduced CO2 emission by 725

MT, which supports our corporate carbon reduction goal and promotes our environmental stewardship; iii) provides points of differentiation for groups looking to do business with hotels that are more environmentally friendly; and iv) provides publicity both internally and externally as we were the first Marriott Hotel to accomplish ISO 50001 and SEP certification. The benefits are both tangible and intangible. For example, the EnMS process helped us to save money. Additionally, it allowed us to meet corporate/government group's RFP requirements regarding Environmentally Sustainable Hotel Operations, which is needed to be eligible for this type of business. An unexpected benefit is that hotel associates have become highly engaged towards energy conservation efforts due to the communication and awareness campaign put in place through EnMS implementation.

Exhibit A



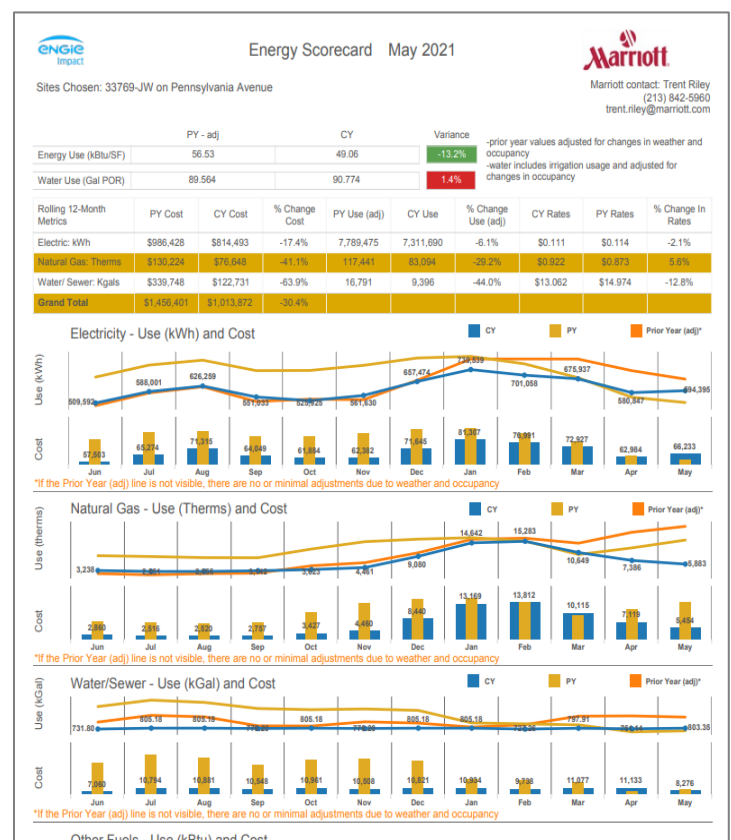
## Plan

The overall effort requires the focus of top management. This consists of the Corporate Director of Energy, Hotel's executive committee members, including the hotel General Manager, Director of Engineering and Director of Finance, who all have control and influence on energy usage and energy project implementation at the hotel.

Our management has aligned with our energy reduction goals and demonstrated its commitment to support

EnMS by consistently monitoring and reviewing EnMS overall. This includes i) revisiting objectives and targets, plans and actions; ii) monitoring energy usage trends; and iii) reviewing monthly energy usage analysis report (Exhibit B) developed by ENGIE, a consultant who reviews utility bill usage and cost and conducts audit and analysis services. Consistent focus provides an understanding of where energy is used the most and allows the hotel to set a priority energy goal each year. We are able to focus on the most impactful improvements and ensure that we pursue the implementation of impactful energy ROI projects.

Exhibit B



We then consistently monitor progress and adjust as necessary. For example, our monthly energy report contains weather and occupancy normalized data to

make real energy comparisons with similar Marriott Hotels across the portfolio. This comparison allows us to ensure our goals are achievable and realistic and allow us to determine if other measures can be taken to drive reduction in energy consumption. The comparison also helps show our progress against similar hotels to ensure that we continue to be the market leader in Energy and Environment initiatives. EnMS is the tool that narrows down our focus in developing energy strategy in a measurable and achievable way. Projected occupancy, operational changes, and any upgrade done on major energy usage equipment are taken into consideration while setting and monitoring a goal.

Based on the changes from our initial certification, we had to revisit our energy manual and fine-tune our processes to adopt new requirements including the scorecard method for SEP certification. It helped us to further enhance EnMS processes and execution. It also created more accountability to plan energy ROI projects and related activities for successful implementation.

All these plans and actions are developed based on the resources allocated by the top management and its commitment to the goals. We have a highly engaged top management team who inspires the operational team to educate and evaluate EnMS process and benefits.

***“Working toward SEP 50001 certification helped the hotel to merge existing resources and energy conservation best practices, provided by the Marriott International energy team, with SEP 50001 guidelines. The combination helped us save time and effort, establish robust processes and communication pathways, and hold ourselves accountable for consistently delivering results.”***

—Rajaram Srinivasan, Director of Engineering, JW Marriott Washington, DC

## Do, Check, Act

In addition to top management involvement in goal setting and monitoring, the JW Marriott Washington DC has incorporated a Hotel Energy team into the process. The team includes representatives from all major departments. This multi-disciplinary approach is critical i) to ensure all ideas are incorporated in the effort; ii) to drive compliance with identified and important energy savings measures; and iii) to provide appropriate messaging that sustainability requires the whole hotel.

The team has setup a communication board to ensure the essence of EnMS, program implementation process and top management commitments reaches everyone at the hotel. We have also presented the program goal, each department's responsibility to support the program, and the implementation progress and benefits at our staff meetings. A two-page brochure is distributed to staff and vendors with easy-to-understand program highlights and their role in supporting the program.

As mentioned previously, the monthly energy report generated by our 3<sup>rd</sup> party Energy Consultant contains weather and occupancy normalized data with last 12 months utility consumption. We analyze this report, adjust our monthly targets, and react to any variance that affects performance. In addition, top management reviews monthly energy data during monthly critique meetings and holds the team accountable for achieving the energy targets.

In addition to the everyday activities of the team, the following actions helped us to achieve our targets. These additional reductions came after our initial certification in which the hotel reduced energy consumption by 16.5% from 2013-2016:

- ❖ **Booster pump replacement:** Installed variable frequency drive-based booster pump to meet building water pressure at various occupancy load
- ❖ **LED upgrade:** Upgraded to energy efficient LED lights in meeting rooms, back of house areas, public areas, and stairwells. Implemented



reduced wattage LED bulbs where possible and added dimming systems

- ❖ **Hot water storage temperature:** Reduced hot water storage temperature from 160°F to 140°F
- ❖ **Chilled water diagnostic tool implementation:** Implemented corrective action to enhance plant efficiency to 0.79 KW/Ton
- ❖ **EMS Head-end system upgrade:** Reduced average running hours of air handling units through effective scheduling with upgraded building automation system
- ❖ **Ballroom AHU replaced:** Reduced energy usage from energy efficient motors, variable frequency drive and fan blade

All of the efforts taken to manage energy are measured and monitored to drive process improvements and make tweaks to ensure performance. For example, energy ROI projects each have an estimated energy saving performance expectation. Upon full implementation of the project, the Director of Engineering verifies the performance and resulting energy savings against this expectation through analysis of the monthly utility bills. If any discrepancy between the expected and actual savings is found, we engage the vendor/manufacture to reevaluate the system implementation and performance and hold them accountable for achieving the expected energy savings.

Additionally, we utilize a list of equipment that uses significant energy and its associated anticipated energy usage to determine energy performance improvement. For example, the chiller plant consumes the most energy in the building and its performance improvement is evaluated by using a chilled water diagnostic tool to ensure the system performs to its designed parameters. This tool provides recommendations to improve system performance along with an action plan. We then implement the recommendations to drive improved performance. When we upgrade major equipment or complete renovations, we source energy efficient

products and equipment to improve efficiency over older equipment.

Lastly, we have developed an energy usage data spreadsheet for the past 10 years which allows us to compare and monitor energy usage based on various utilities. This allows us to get a long-term view of our overall improvement over the years. To ensure our performance data is accurate and normalized to account for outside factors, we have used heating and cooling degree days, hotel occupancy and chilled water export to our neighbor building as independent variables. Our  $r^2$  value for electricity is 0.92 and natural gas is 0.56, both of which are well above certification expectation.

For certification purposes, we input our utility data into a Georgia Tech developed SnPI tool to determine baseline year, model year, reporting year and the adjustment method. This 3<sup>rd</sup> party comparative spreadsheet gives a clear understanding of our performance measures against the base line year from August 2016 to July 2017 and reporting year from August 2019 to July 2020.





## Transparency

Our energy management efforts in addition to other sustainability efforts are monitored by 3<sup>rd</sup> parties to ensure that any outside reporting is accurate. As a prime example of this, our Hotel pursued and received SEP

50001 Platinum Level Certification. This is the 2<sup>nd</sup> time we have received SEP certification. Based on this, we have done a joint press release (Exhibit C) with our 3<sup>rd</sup> party accredited audit agency. In addition, we have been working with Department of Energy for a joint press release of our recertification in 2021. An article will also be published in our Marriott Corporate Lodging Engineering quarterly newsletter. We have been working with our corporate communication team to highlight our sustainability achievements in Marriott International's Global Communication platform. Lastly, we have been actively communicating with our existing and new clients about our SEP certification which helps to improve our business opportunities and serves as a differentiation point for our hotel.

*Exhibit C*


**Press Release**

JW Marriott Washington DC achieves certification to the new ISO 50001 – Energy Management Systems standard.

This hotel is the first commercial building to achieve the recognition in the United States with ANAB accreditation.

September XX, 2013 - DEKRA Certification, Inc. (DCI) has completed certification audit of the **Energy Management System (EnMS)** of JW Marriott Washington DC. Based on the audit results, DCI presented an ANAB accredited ISO 50001 certificate to the hotel on September 25, 2013. The audit conducted by DEKRA, verifies that JW Marriott Washington DC has implemented an Energy Management System, and that the normalized energy performance at the 1331 Pennsylvania Ave, NW location improved over the baseline.

"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," said Raj Srinivasan, director of engineering, JW Marriott Washington, DC.



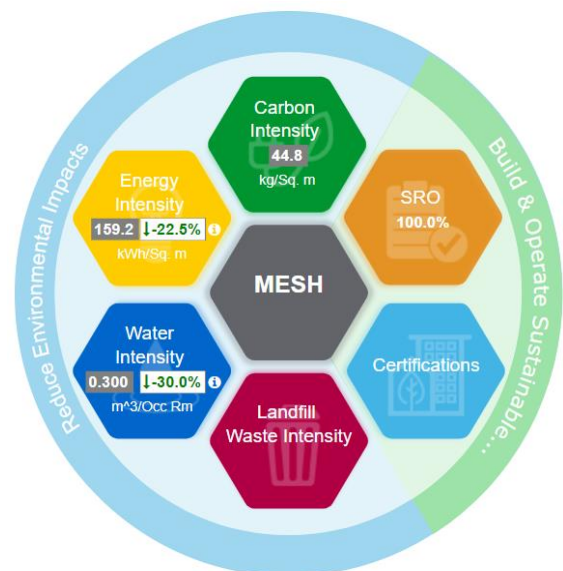
The purpose of this particular certification is to provide an energy management framework for any organization utilizing energy resources in order to operate effectively. A process of improvement becomes part of the everyday culture.

DEKRA is a leader worldwide on ISO 50001 and SEP (Superior Energy Performance) certification program. These energy management standards are intended to result in sustainable improved energy performance. Our experience in value-added management system certification has helped us to position our company in this leadership position. DEKRA holds accreditation to ANSI, ANAB, and DAKs for Energy Management System certification.

## Lessons Learned

JW Marriott Washington DC is the first Marriott Hotel to achieve SEP 50001 certification and to pursue and achieve certification for the second time. We have put exhaustive efforts in developing our EnMS program and operating manual for its successful implementation. However, each time we find opportunities to make our process better. For example, in the future, we would do the following:

- Appoint a dedicated Program Manager, whose primary responsibility would be to focus on day-to-day EnMS program implementation, progress and communication that could further enable staff engagement towards energy conservation measures
- Work with multiple sites (hotels) to share resources, best practices, and costs to increase the impact of the effort and allow more Marriott Hotels to achieve SEP 50001 Certification
- Identify more internal and external energy training opportunities to help improve energy saving



The Energy Management Leadership Awards is an international competition that recognizes leading organizations for sharing high-quality, replicable descriptions of their ISO 50001 implementation and certification experiences. The Clean Energy Ministerial (CEM) began offering these Awards in 2016. For more information, please visit [www.cleanenergyministerial.org/EMAwards](http://www.cleanenergyministerial.org/EMAwards).