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Marriott International Measurement and Verification (M&V) Process for Product Approval

Marriott International has demonstrated its commitment to sustainability via their 2016 based SERVE 360 goals. Among these new goals are goals to reduce carbon and water intensity by 30 percent and 15 percent respectively by 2025. As part of Marriott's efficiency efforts, energy and water saving products are frequently evaluated to determine whether they should be labeled as approved solutions for use in Marriott's global portfolio of buildings. **The following document outlines the formal Measurement and Verification (M&V) process that product vendors must follow to obtain the Approved Energy/Water Solution label.** The term 'product' used throughout this document also applies to energy/water saving systems or services.

Executive Summary: *Marriott has developed this M&V approach to assess potential energy/water saving products (and services) for inclusion into the Marriott portfolio. All vendors must follow this M&V approach. A complete M&V study will need to be completed once; if the product shows favorable results, the product will obtain the Marriott "Approved Energy/Water Solution" status with a recommendation to adopt in other Marriott facilities. All products must participate in "Step 1" of the process. This is a high level review of the product to ensure the product meets Marriott's initial criteria. It is also a safe guard for the vendor to minimize unnecessary M&V costs. If the product passes "Step 1", the path and cost of "Step 2" will depend on the vendor's need for assistance and the complexity of the product.*

- ❖ **Step 1: Initial review of product energy/water savings** – The first step in the M&V process is a high level review to evaluate the product's energy/water savings basis and ensure that the product's application generally fits the Marriott portfolio of buildings. Bolder Energy, a third party M&V provider, will perform the following:
 1. Review information on the product including technical details, installation processes, product applications, general costs, and energy/water savings documentation.
 2. Perform independent research on similar products and other available studies (previous M&V studies, formal white papers, scientific studies, engineering calculations, etc.).
 3. Evaluate the product energy/water saving claims and expected economics. To meet Marriott's ROI requirements, products generally need to have a **simple payback less than three years**.
 4. Develop a monitoring plan that will capture all critical variables affecting system performance and related energy/water savings. Specify the monitoring duration. Discuss potential Phase 2 path.
 5. Summarize the results of the evaluation including a recommendation to move on to Step 2, (Detailed M&V) and the planned approach and costs for the remaining M&V process.

There are no guarantees that participating in the Initial Review will lead to a Detailed Study. If it is found that the product does not fit with Marriott's portfolio of buildings, the energy/water savings do not have sufficient basis, or the payback is longer than Marriott's criteria, the product will not be recommended for further study in the Marriott energy/water program. However, the Vendor can still choose to do a third party M&V study separate from the Marriott program.

- ❖ **Step 2: Perform Detailed M&V** – After the product passes the Initial Review, the product moves into the detailed M&V process. Detailed M&V will follow an International Performance Measurement and Verification Protocol (IPMVP) Option B approach and requires monitoring of key variables before and after a product is physically installed. Energy/water analysis to determine estimated annual energy/water savings is also required. Monitored energy/water use at the building utility meter level (IPMVP Option C approach) is not sufficient information for this detailed M&V process. One of the following paths will be followed in this phase:
1. Path 1: Review a prior 3rd party study. The study must contain a thorough analysis and include all monitored points outlined in the monitoring plan.
 2. Path 2: Review installation data collected from previous pilots. The data previously collected must contain all monitored points outlined in the monitoring plan.
 3. Path 3: Select a location for physical installation of the product. Monitor the selected variables before and after installation of the product according to the M&V plan. Vendor and M&V consultant roles and responsibilities to be determined.
 4. All Paths: Using the collected data, evaluate the product's performance and calculate the estimated energy/water savings. If vendor analysis tools are used to estimate energy/water savings, these tools will also be reviewed. If applicable, extrapolate annual energy/water savings to other climate zones using four to five representative TMY weather data files.
 5. All Paths: Prepare the business case including completion of the Marriott ROI calculator with estimated annual energy/water cost savings and product costs.
 6. All Paths: Summarize results in a final M&V report.

Bolder Energy, or another third party M&V provider selected by the Vendor, can assist with or perform any of the above items. At a minimum, Bolder Energy will review the M&V process conducted and prepare the final recommendation for approval. The detailed M&V study will present the results found. *There are no guarantees that participating in the Detailed Study will produce favorable results or lead to Marriott installations.*

If Approved, Next Steps and Marketing Benefits

Upon completion of the second phase and if final approval is granted, the vendor's product is listed as an "approved Marriott technology" on the internal website. While individual properties may browse the intranet for approved technologies (and reach-out to the vendor if interested), typically the vendor still has to conduct business development/sales efforts for individual properties (ie Marriott does not push technologies or products out to individual properties). Additional pilots/studies should not be needed for individual properties; however the proposals for individual properties are each reviewed by the internal Marriott energy team for site specific details and resulting economics (this review is not an additional cost to the vendor).

Additional program benefits of participating in the M&V program include:

- Attain Marriott "Approved Energy/Water Solution" status with inclusion in the internal Energy Toolkit site with a recommendation to adopt in Marriott facilities. Approved vendors have their own page on the Toolkit site with the report, approved energy models, and some sales contacts (*note vendors can have input on content and appearance*).
- Approval can be marketed by the company (*note however that Corporate Marriott PR approval is needed for use of Marriott's name*).
- While Marriott does not push technologies or products out to individual properties, introductions are made in markets with super compelling ROIs or "not to be missed" rebates.

- Receive a third party report that followed a verifiable M&V approach and summarizes the details and results of the study. This report can be used as a case study to assist with sales to potential customers.
- Other vendors have indicated that this process has strengthened their sales process.

Approximate Costs

The Detailed M&V (Step 2) fee depends on the complexity of the system, the path chosen, and the assistance required from a third party M&V provider. System complexity is divided into levels primarily based on the number of monitoring points (pts) required. A “simple system” would require limited monitoring, such as wattage and light level for a lighting retrofit, and a “complex system” would require monitoring of multiple pieces of equipment and parameters, such as all equipment in a central chilled water plant. The actual cost for Detailed M&V (Step 2) will be determined for each specific product and will account for individual vendor M&V assistance needs.