

EVO IPMVP Verification

Voltage as a Service (VAAS)TM is an energy-saving service solution for regulating and optimising the voltage supplied to electrical equipment to the optimal level for efficient operation. The purpose of VAAS is to reduce energy consumption, lower electricity bills, and decrease carbon emissions by ensuring that electrical devices operate at their most efficient voltage level.

EVO

The Efficiency Valuation Organisation (EVO) provides standardised methods for verifying energy savings, including those related to VAAS based Voltage Optimisation (VO) projects, through its International Performance Measurement and Verification Protocol (IPMVP).

The IPMVP outlines various approaches that can be applied to measure and verify energy savings. In this Application Note, we describe the key methods relevant to verifying VAAS based VO energy savings performance.

IPMVP Methods

IPMVP Method	Description	Application to VO	Key Metrics
Option A Retrofit Isolation with Key Parameter Measurement	This method involves measuring key parameters directly related to the VO system while estimating other parameters that are less critical or have lower variability.	For VO projects, Option A might involve directly measuring the voltage before and after optimisation while estimating the energy savings based on historical data or assumptions about load profiles.	<ul style="list-style-type: none"> Pre- and post-optimisation voltage levels. Estimated load characteristics. Expected savings from voltage reduction (typically using a predefined energy savings factor).
Option B Retrofit Isolation with All Parameter Measurement	Option B focuses on directly measuring all key parameters that affect energy consumption, without relying on estimates or assumptions.	For VO projects, this could involve continuous monitoring of voltage, current, power, and energy consumption before and after VO implementation.	<ul style="list-style-type: none"> Actual energy consumption data. Direct comparison of pre- and post-implementation energy use. Measurement of changes in voltage, current, and power across the optimisation period.
Option C Whole Facility Measurement	This method uses whole-facility energy consumption data to determine savings by comparing the total energy use before and after the implementation of the VO system.	Suitable for facilities where the VO system is expected to impact the entire site's energy consumption. The method relies on utility meters or other whole-facility metering to capture energy usage.	<ul style="list-style-type: none"> Total facility energy consumption over a defined baseline and post-implementation period. Adjustments for weather, occupancy, or other variables that could affect energy use.



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Option D Calibrated Simulation	Involves using calibrated simulation models to estimate energy savings by modelling the entire facility or specific systems under both baseline and post-implementation conditions.	This method may be used when it's impractical to measure all energy parameters directly. A calibrated simulation model of the facility can incorporate the effects of VO, and savings are determined by comparing simulated baseline energy use with simulated post-implementation use.	<ul style="list-style-type: none"> Model calibration to match actual energy consumption data. Simulated energy consumption under baseline and post-VO conditions. Estimation of savings based on model output.

The EVO IPMVP methods provide a structured and standardised approach to verifying the energy savings achieved through Voltage Optimisation, ensuring that the reported savings are accurate and credible.

Key Considerations for VO Measurement and Verification

- **Baseline Establishment:** Accurate determination of the baseline energy consumption is critical for all IPMVP methods. For VO projects, this includes accounting for any factors that could influence the load, such as time of day, weather, and occupancy.
- **Post-Implementation Monitoring:** Continuous or periodic monitoring post-implementation helps verify that the VO system is performing as expected.
- **Adjustments for External Factors:** Any significant changes in operating conditions, such as production levels or occupancy, must be adjusted to ensure that the savings are attributed correctly to the VO system.

EVO Guidance on Documentation and Reporting

- **Documentation:** Clear documentation of measurement methods, assumptions, and calculations is necessary to ensure transparency and reproducibility of the savings.
- **Verification Reporting:** The final verification report should include detailed descriptions of the VO system, measurement methods, baseline and post-implementation data, adjustments made, and the calculated savings.

References

- **International Performance Measurement and Verification Protocol (IPMVP)** by the Efficiency Valuation Organisation (EVO).

VAAS can provide a very useful contribution to a company's plans to meet its Carbon emission targets, as well as reporting requirements. VAAS provides the right voltage to electrical equipment, ensuring efficiency, cost savings, environmental benefits and performance reporting while maintaining equipment performance and longevity.

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