HanitaFirst Measurement & Verification Program

According to Efficiency Valuation Organization (EVO), *"M&V is the process of using measurement to reliably determine actual savings created within an individual facility by an energy management, energy conservation or energy efficiency project or program. As savings cannot be directly measured, the savings can be determined by comparing measured use before and after implementation of a project, making appropriate adjustments for changes in conditions."* In addition, as stated by Lawrence Berkeley National Laboratory (LBNL), M&V of energy savings, generated through building systems retrofits and upgrades such as window film, requires special project planning as well as unique engineering practices.

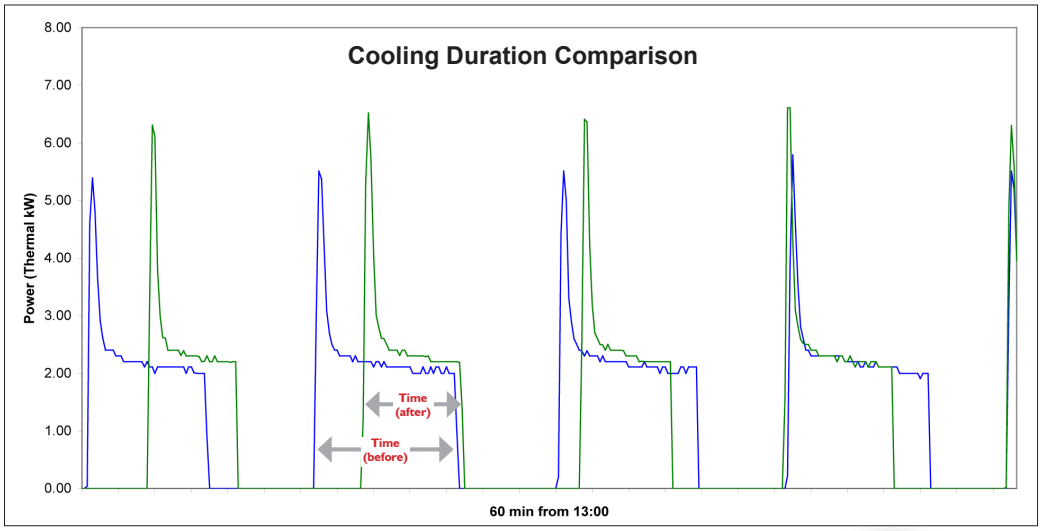
For this M&V study, measurements were recorded each second including the following:

- Outdoor Solar Radiation
- Outdoor Temperature
- Indoor Temperature
- Chilled Water Temperature
- Chilled Water Flow

20% Reduction in Cooling Power Measured

24h Period	Cooling Power (BTU/hr)	Radiation (BTU/ft²)	Temp-Out (°F)	Temp-In (°F)	ΔT (out-in)
Without Film	136	72.9	85.8	69.8	16.0
With Film	109	74.6	86.3	70.1	16.2

Temperature Setpoint Reached 22% Faster



5 step plan

Building Survey → Energy Modeling → Incentives Assessment → Film Installation → **Measurement & Verification**

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