

Potential Savings with Events2HVAC Event Automation Software

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Introduction

The Events2HVAC event automation software is the energy and labor saving bridge between your facility's event/room reservation software and your building automation system (BAS).

In a traditional setup, these two systems operate independently, with manual interaction and coordination required between them. The event/room reservation software contains information about the events that are scheduled, the rooms that are booked, and when things need to happen. While the BAS controls the environment, lighting, and security in the facility.

One problem facilities face is coordinating the scheduled events with the facilities personnel to make sure the lights are on, the rooms are comfortable, and the necessary equipment is setup for an event. This is typically a manual process prone to mistakes. For a facility that is booking multiple rooms on an hourly or daily basis, keeping BAS schedules synchronized with the event/room reservation software schedules can be a time-consuming job.

This leads to another common problem. Because of the labor required to keep schedules synchronized, some facilities resort to turning systems on prior to the first event and leaving everything running until the final event for the day. Energy is wasted because the facility is heating, cooling, or lighting empty rooms.

Events2HVAC offers a solution to both problems. Successful automated synchronization between your event/room reservation software and your BAS can yield significant energy and labor savings. This document outlines examples of the potential energy and labor savings from using Events2HVAC.

Potential Energy Savings

One common approach to scheduling events in a BAS is simply to turn on the system at the start of the day and leave it on until the last scheduled event. If we make several assumptions, we can estimate the energy savings from using Events2HVAC compared to this approach. If we assume a 2000 hour year (50 weeks @ 40 hours/week), and estimate a savings rate per hour when a room is unoccupied, we can estimate the energy savings for a 1000 square foot room in one year as shown below:

Example

A 1000 square foot room is occupied 65% of the time. It is unoccupied 35% of 2000 hours, or 700 hours. The BAS system would normally be run continuously during this time. With Events2HVAC event automation software, the room can be set to unoccupied status and cooled, heated and lighted less.

If we assume that setting the room to unoccupied status saves \$0.25 per hour (this includes the HVAC and lighting costs), you can save:

*$\$0.25 / \text{hr} * 700 \text{ hrs} / \text{year} = \$175 \text{ per year for each 1000 square foot room}$*

If the occupancy rate decreases or the savings per hour increases, the overall energy savings will increase. Figure 1 shows the different potential savings for a single 1000 square foot room for one year, given different occupancy rates and energy savings rates.

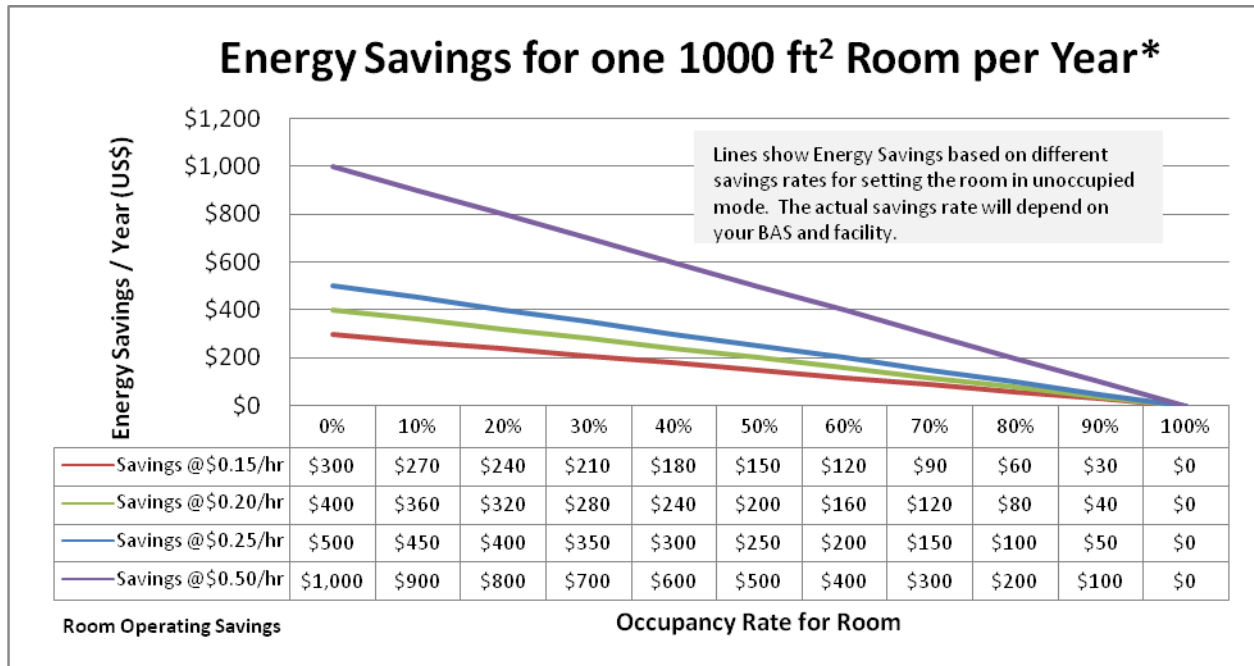


Figure 1: Energy Savings for one 1000 ft² Room per Year

*Energy savings and labor savings are dependent on multiple factors including the type of HVAC equipment, lighting types, weather conditions, geographic location, cost of energy, and human behavior. These examples show possible annual savings given different variables as compared with leaving the room occupied for 40 hrs/week * 50 weeks/yr (2000 hrs).

To accurately determine your overall facility savings, you will need to do some energy cost analysis for each room and create a worksheet similar to the one below:

Room Number	Area (ft ²)	Operating Cost (\$/hr) (Occupied)	Operating Cost (\$/hr) (Unoccupied)	Savings Potential (\$/hr)	% Occupancy	Annual Savings*
Room #1	1,200	\$0.27/hr	\$0.10/hr	\$0.17/hr	65%	\$ 119
Room #2	15,000	\$5.50/hr	\$0.00/hr	\$5.50/hr	30%	7,700
Room #3	5,000	\$1.15/hr	\$0.35/hr	\$0.80/hr	50%	800
Total						\$8,619

* Annual savings vs. operating the room 40 hrs per week * 50 weeks/year

Determining the operating cost for each room requires extensive energy analysis. Some typical examples of energy use are described in the following sections.

Lighting

Lighting cost is the easiest to calculate. If you assume the typical design load for lighting an office is 1.5 Watts/ ft² and your energy cost is 10 cents/kWh, your operating cost per 1000 square feet is \$0.15.

For spaces like auditoriums and theatres, the lighting load will be much higher per square foot.

Heating and Cooling

Determining your heating and cooling energy use is much more complicated and is beyond the scope of this document. Your facility manager might have some figures for your building. There are too many variables for a simple calculation, but if you have equipment that is turned on during occupied and turned off during unoccupied times, you can determine the load from the equipment specs and come up with an approximation.

For example, if you have a dedicated fan system that serves a room and you know the horsepower of the fan, you can calculate the operating cost of that fan using the following formula:

$$\text{Fan kW} = \text{HP Fan} * 0.746 / \text{Motor Efficiency}$$

$$\text{Operating Cost (\$/hr)} = \text{Fan kW} * 1 \text{ hour} * \text{energy cost}$$

Example

A single room has a dedicated 2 Horsepower fan system that runs when occupied and is off when unoccupied.

We'll assume a typical fan motor efficiency of 89%.

*Operating cost for fan = (2 HP * 0.746)/0.89 * \$0.10/kWh = \$0.17/hr*

(This example doesn't include cost for heating or cooling.)

Potential Labor Savings

The other common scheduling approach for the BAS is to manually synchronize it with the scheduled events. Facility management must either:

- 1) Schedule the BAS system to turn on/off at the start/end of the event.
- OR
- 2) Go to the room and manually turn it on/off at the start/end of the event.

If we make several assumptions, we can estimate the labor savings from Events2HVAC compared to these approaches. Let's assume that it would take an average of five minutes for facility management personnel to schedule the BAS system to match the first event scheduled for a room and one minute for each additional event scheduled as shown in Figure 2.

Number of Events for a Room / Day	Scheduling labor Required (min.)*
1	5
2	6
3	7
4	8
5	9
6	10
7	11
8	12

Figure 2: Scheduling Labor per Room

*Labor includes coordination with event schedulers and manual entry of schedules.

Let's also assume that the facility is scheduled for 250 days per year and each room can be booked up to four times a day. We can then estimate the labor savings per room in one year as shown below:

Example

A room is booked four times per day. Assume conservatively that it will take a person five minutes to set up the BAS schedule for the first event, and one minute for each event thereafter. This equals 8 minutes per day for four events.

Assume a facility employee is paid \$30 / hour.

The labor cost to keep event/room reservation software and the BAS synchronized would then be:

*250 days / year * 8 minutes / day * 1 hour / 60 minutes = 33.3 hours / year*

The labor savings for that room per year would be:

*\$30 / hr * 33.3 hrs / year = \$1000 per year for each room*

If your facility is manually synchronizing events with facility equipment schedules, you might not realize as much energy savings as those who keep systems running when rooms are unoccupied, but you will reduce your labor and errors related to manual scheduling by using Events2HVAC event automation software. Figure 3 shows potential labor savings for a single room for one year, given different labor compensation rates.

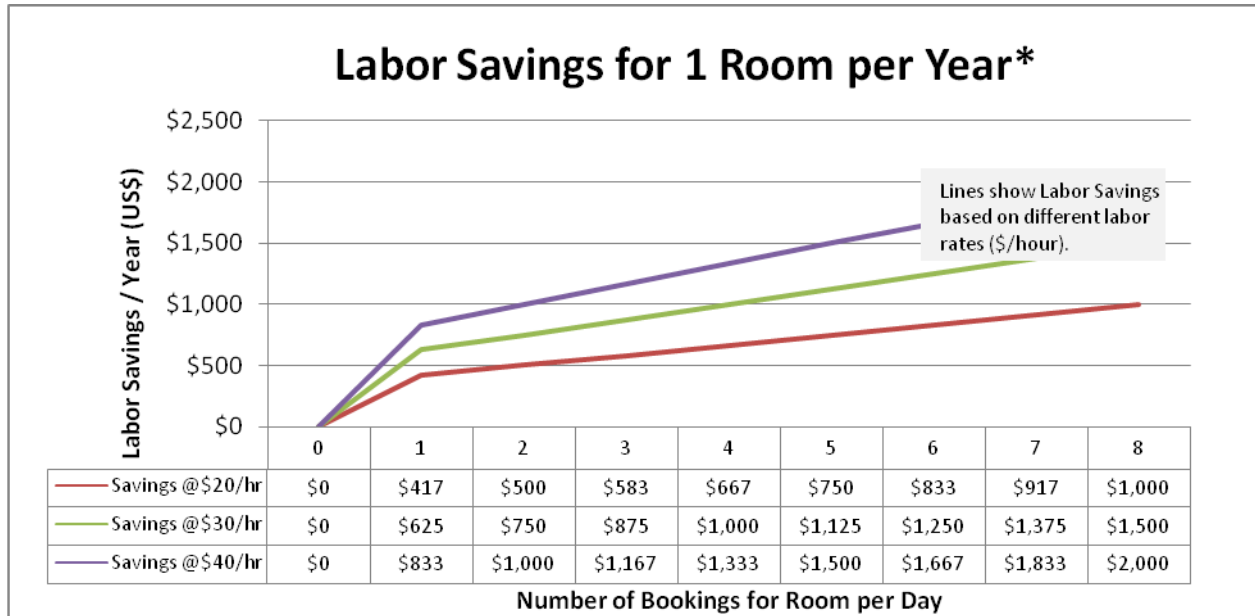


Figure 3: Labor Savings for 1 Room per Year

* Labor savings are dependent on multiple factors including complexity of systems, number of scheduling tasks per room, coordination requirements, and human behavior.

Conclusion

Your facility has a unique combination of BAS equipment, rooms, occupancy rates, energy costs, labor rates, etc. A detailed study would be required to determine your savings from using Events2HVAC.

However, regardless of your facility size and setup, you will enjoy considerable savings by using Events2HVAC event automation software. In most cases, the one-time cost to deploy Events2HVAC can be recovered in a period of a few months, and thereafter the savings will fall straight through to increase your bottom line.

Call us for assistance in performing a detailed analysis of your particular facility and conditions.

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