

# Benefits of Building Automation Systems

## *The immediate benefits are...*

*Lowers utility costs* – Building Automation Systems typically saves 15% of the operating costs of the equipment. For most buildings this results in savings that range from \$0.20 to \$0.40/square foot.

*Maintains measured comfort* – Computerized controls help to maintain even temperatures and lighting levels within the facility to provide measured comfort. Maintaining consistent temperature and lighting levels cuts down on wasted energy.

*Enhances property value* – The value of most commercial buildings is related to the net operating income. Lowering utility costs increases the net operating income on a dollar for dollar basis. Every \$0.10/square foot saved in energy could increase the market value of the property by \$0.80/square foot. A 100,000 square foot building could increase in value by \$120,000 by reducing energy costs \$0.15/square foot.

*Reduces occupant complaints* – A more comfortable building means fewer occupant complaints. This means less time resolving complaints, happier occupants, and a more productive business environment.

*Increased Productivity*- Better ventilation and air quality improve greater worker productivity and less sick time. The value benefits average \$25.00/ square foot. With decreased sick days translated into a net impact of about \$5.00/square foot and increased in productivity translated into a net impact of about \$20.00/square foot.

*Simplifies building operation* – Computerized controls and real time graphical displays let you see exactly what is happening with the equipment in the building without having to go up on the roof or crawl up into the ceilings. This saves on costly problem determination visits, and simplifies operations.

*Reduces maintenance costs* - Running the equipment less and controlling it better reduces wear-and-tear and keeps maintenance costs down, and extends equipment life.

*Avoids business interruptions* – Unexpected equipment breakdowns can cause very costly business interruptions. The cost of employees and or processes in a building can easily be 50 to 100 times the facility operating cost on a square foot basis. The impact when customers are involved can be equally costly. Breakdowns and emergency repairs are very expensive. Computerized controls monitor equipment status and help you head-off unexpected problems.

*Is a great investment* –Most systems will pay for themselves in less than two years. Typical numbers for an owner-occupied 100,000 square foot building would be as follows:

Total system cost	\$200,000 (\$2/sq. ft)
Utility Company rebate	\$30,000 (15% rebate)
Annual energy savings*	\$15,000 (15% savings)
Annual productivity loss avoidance *	\$50,000 (1% savings)
Annual O & M cost avoidance*	\$10,000 (10% savings)
Simple payback	1.3 years

\*Annual cost avoidance *year after year*.

### *The future impact is...*

*It Makes Quantum Improvements Possible* – There is a connection between operating cost, environmental quality, and profitability. Computer technology is the key to managing facilities and costs effectively. Without better tools, the existing personnel cannot keep up with increasing demands. Either quality suffers or costs increase in other areas (like contracted services, utility charges, or personnel).

*It Manages Direct and Hidden costs* - Recognizing the real costs (both direct and hidden) and how they are controlled affects an organization's ability to compete. The following costs can be significantly reduced using facility automation technology:

1. *Personnel* - Operating personnel need the tools that technology provides to leverage their expertise and time. Without better systems, quality will degrade and overall costs will rise.
2. *Utilities* - Energy costs are a large part of the controllable facility budget. Integrated facility automation makes controlling utility costs possible.
3. *Equipment Repair and Replacement* - Repair and replacement of aging building equipment is a fact of life. Newer technology equipment is generally less expensive to purchase, install, operate, and service. Every significant equipment repair or replacement should be evaluated against the cost of upgrading to the newest technology.
4. *Lost Productivity* - There is a direct correlation between comfort and the productivity, receptiveness and efficiency of conducting business. Even small percentage losses due to equipment breakdowns or comfort problems represent huge costs and can easily justify providing a proper building environment.

### *How does Building Automation work?*

*HVAC and Lighting Controls* – Stand alone computerized controllers are installed to take over the control of building HVAC (heating, ventilation, and air conditioning) systems and lighting. The building is not only scheduled more closely but it is also operated more intelligently and efficiently.

*Outside Air Optimization* - Proper control of outside air provides necessary inside air changes for occupant comfort and health, minimizes energy costs by space pre-conditioning, allows for enthalpy-based free cooling, and reduces the use of outside air when it is not needed.

*Coordinating Equipment* - Orchestrating the operation of building systems, so that equipment works together, saves energy and improves comfort. Individual control systems that are not centrally monitored and coordinated can fight each other or malfunction, causing comfort problems and wasting considerable energy. BACnet based BAS can interface to existing or planned systems so that the building will run smoothly and at peak efficiency without expensive duplication of controls or unnecessary complexity.

*Graphical Operation* - Simplifying facility operation and integrating data from various systems in a "seamless" manner is best accomplished with a graphical user interface. This eliminates the need to memorize commands or point numbers, and allows the operator to take a walking tour of the facility from the console. Existing systems can be easily upgraded to add this powerful operational tool. Point and click graphics empowers management by letting everyone see what is going on and taking the mystery out of proper operations.

*Direct Digital Controls (DDC)* - Upgrade older existing equipment to DDC to match new equipment functionality. These controllers come standard on most new mechanical equipment and are more reliable, require less maintenance, provide more sophisticated control, and are less expensive to purchase and operate.

*Tighter Scheduling* - Conventional controls, such as time clocks, are inaccurate and are typically setup to run equipment longer than the actual need. By automating this function with computerized controls, the computer can predict the optimum time to start/stop equipment and eliminate waste caused by excessive runtime.

*Smarter Control* - HVAC equipment is typically sized to handle the building load under worst-case conditions. Most conventional controls are set up to meet these design criteria at all times. With the automation system, control set points and strategies can be adjusted to meet only the actual load, eliminating unnecessary waste.

### **Recommendation...**

Energy conservation is a cost-effective business strategy for the future. Get started today and contact Jessica Burdette at Energy Management Solutions, Inc to arrange for a no-cost, no-obligation, on-site assessment. [jburdette@EMSenergy.com](mailto:jburdette@EMSenergy.com) or 952-767-7461. Energy Management Solutions, Inc. provides rebate support for qualifying BAS retro-commissioning projects and Efficiency Controls.



***Doing nothing isn't much of an option. If you wait until the cost of energy truly impacts your bottom line, you have been wasting a lot of money.***