

Enterprise asset management for smarter buildings

*Creating sustainable business operations with IBM asset
and integrated workplace management solutions*



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Introduction

An organization's buildings, equipment and technology assets have always required close, careful management from staff specialized in operations and maintenance. Today, management tasks may be less hands-on and more computer-based, but asset management still must be closely focused, constantly monitored and regularly adjusted.

On a smarter planet, where assets are more instrumented, interconnected and intelligent than ever before, effective management plays an increasingly important role. Asset management can help reduce costs; lower energy and natural resource consumption; increase efficient use of space; extend the useful life of equipment; manage inventory, purchasing or lease contracts; and deliver business services that provide a competitive advantage.

Enterprise asset and integrated workplace management solutions from IBM can help create the smarter buildings that a smarter planet demands. IBM solutions offer a full range of capabilities

and best practices. These begin with long- and short-term planning. They continue through deployment, monitoring, calibration and tracking. And they extend into ongoing preventive, reactive and condition-based maintenance, schedule management, and performance and energy optimization.

These solutions can move an organization far beyond conventional hands-on practices, in which maintenance staff typically becomes aware of an issue only when a tenant calls to complain, equipment breaks down or utility bills soar. These solutions can provide integration for energy, operations and space management functions to optimize the entire physical environment of a business.

Creating smarter buildings in the real world

Today, companies and government agencies of every type know the importance of managing their physical assets and the need to create smarter buildings. IBM is a prime example. For years, the IBM facility in Rochester, MN, made investments in high-efficiency instrumentation and advanced sensor and metering technology. It had undertaken a long list of conservation actions. But even as the facility achieved significant energy savings, the need for new approaches was apparent. The company needed better ways to capture data and communicate new insights that would make its buildings even smarter. To do this, the facility management team turned to IBM TRIRIGA® Energy Optimization.

The solution, built on a combination of IBM technology innovation, real-world experience in business analytics and optimization, and the IBM extensive partner ecosystem, enabled the company to maintain reliability and efficiency of facilities while demonstrating environmental responsibility.

With this solution, the Rochester facilities management staff monitored and analyzed heat, air conditioning and power consumption to better manage energy use, lower costs and decrease emissions. The solution identified potential equipment and building problems and prevented breakdowns. It delivered greater insight into the condition of assets and produced automated notifications when assets performed outside of specifications.

When the facilities management team implemented TRIRIGA Energy Optimization in an area of the site, not only did the energy savings on the equipment monitored accelerate by an incremental eight percent from five percent, but preventive maintenance supported by the solution helped extend the life of assets.

Responding to today's issues and tomorrow's needs

Energy use in buildings is growing—by 2025, buildings are expected to be the top consumer of energy in the world.¹ Yet energy growth doesn't have to be so extreme—in many buildings, up to 50 percent of energy and water consumed is wasted.²

Real estate and facilities operations typically represent the largest expenses most companies face other than labor.³ But this large expense is not set in stone. Smarter buildings can reduce energy use by 30 to 50 percent¹ and help decrease maintenance costs substantially.

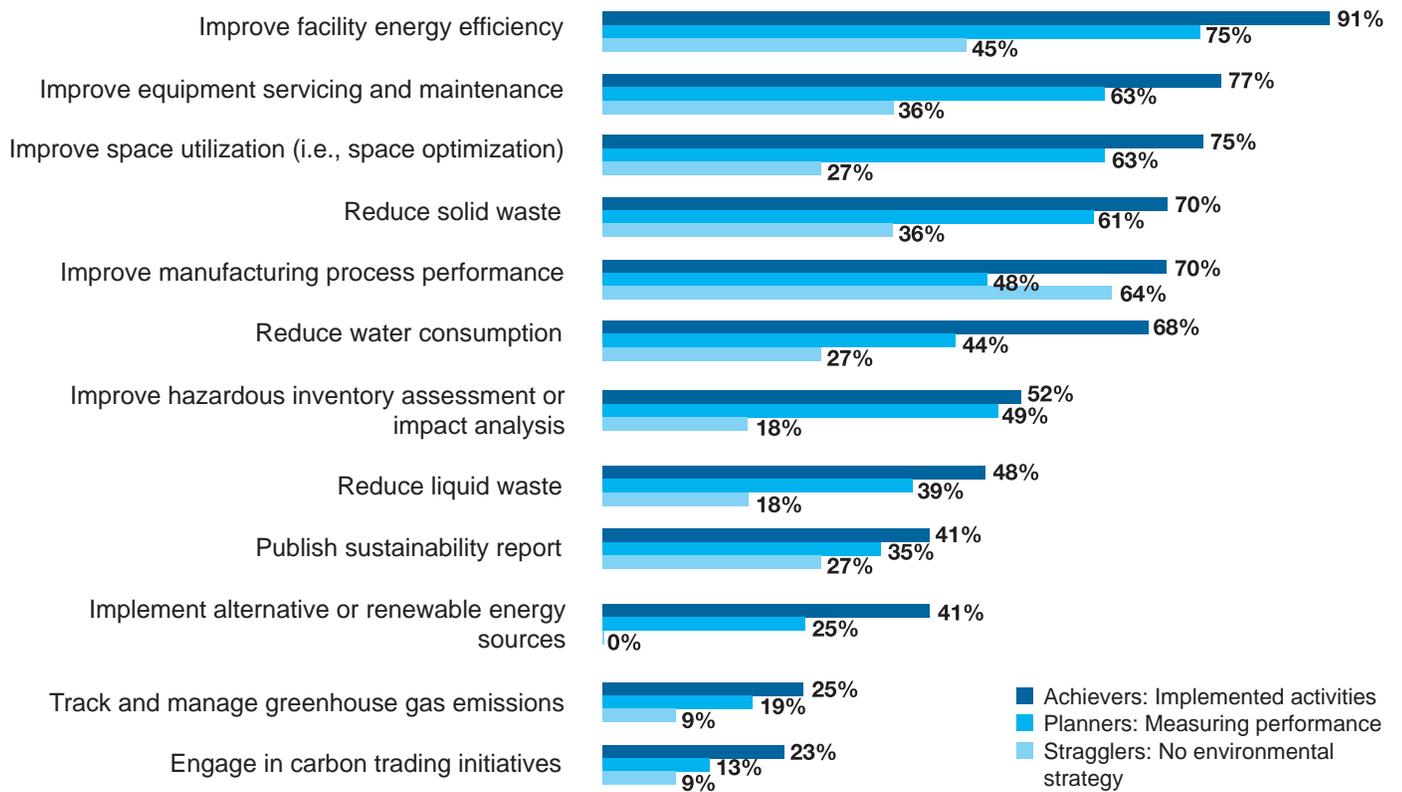
Significant needs—and opportunities—therefore occur in the use and management of energy, operations and space. Organizations can make significant progress toward achieving sustainable building operations with attention in areas that include:

- Integrating IT and building management capabilities using automated processes and centralized views of energy, assets and space data to optimize operational performance
- Optimizing energy consumption to save money, reduce emissions and demonstrate corporate responsibility to the community
- Putting into place smarter-facilities and asset-management processes to enhance the reliability of building equipment
- Developing smarter processes and creating new efficiencies by addressing the management of all infrastructure asset types from a single set of solutions

Addressing core facilities management issues

According to a report recently published by IBM, organizations that stated they achieved their environmental and energy management goals through investments in facility energy efficiency achieved them through three high-level tactics around operational improvements, building retrofit projects and space optimization. The levels of attention given to various energy-related and environmental activities are described in the following chart:⁴

Energy and environmental management activities



Energy

Reduced energy use is made possible by monitoring and analyzing best practices across the property portfolio. These best practices identify anomalies such as simultaneous heating and cooling. They can track and identify the best energy investments

and their impacts. Integrating asset and work order management with energy and sustainability management analytics is a key enabler for reducing energy use and carbon emissions, and for sustaining these reductions. Key areas supported: energy consumption and optimization, environmental management.

Operations

Higher asset utilization is made possible by solutions that enable optimal maintenance throughout the asset life cycle. Better maintenance can increase usable life, reduce operating costs and support sustainability programs. By improving the condition, performance and reliability of assets, the organization can reduce downtime and eliminate duplicate or unused assets. By systematically monitoring and benchmarking asset performance, the chance of business interruption from asset failure can be reduced—a critical goal whether the asset in question is a data center or a manufacturing line. Key areas supported: asset and work management, portfolio management, facility maintenance, condition monitoring.

Space

Improved space utilization can be achieved with insights and capabilities for managing use-assignment and space configurations. The result can eliminate unused or underperforming space and help identify opportunities for space consolidation that reduce the energy and environmental impact of an organization. The key areas supported are strategic facility planning, occupancy management, utilization planning and space optimization.

Spanning all three areas, project management identifies priorities for funding allocations within capital programs, analyzes project risks and financial benefits, and automates project management controls and alerts essential to deliver energy efficiency projects and complex programs of any size in an effective manner.

Smarter buildings

For all three areas, enterprise asset and integrated workplace management solutions can help create smarter buildings by drawing on key characteristics of the smarter planet. Smarter buildings are:

- Instrumented, with sensors, meters and instruments that monitor assets, energy use, equipment status, systems performance, and environmental conditions to supply data to the management solution
- Interconnected, providing integrated data gathering and assembly capabilities that deliver a top-down and bottom-up view of facility performance, including energy and space use and costs
- Intelligent, with capabilities for advanced analytics that can detect and diagnose faults, deliver insight into how to save money, and help predict problems before building performance and occupants are affected

Meeting specialized asset management needs

In addition to addressing the broad areas of energy, operations and space, enterprise asset and integrated workplace management, solutions can help create smarter buildings by delivering specific capabilities that range from energy and environmental management, to facilities management and maintenance, capital project management, real estate portfolio management, and service management. These solutions address needs

for managing energy and occupancy, meeting regulatory requirements and reducing costs with support for best practices including:

- Optimized maintenance planning and scheduling using standard criteria to prioritize critical assets
- Integrated change and work management to better accommodate constant shifts with transparency and visibility across operations, maintenance and engineering domains
- Support for purchasing functions such as requests for quotation, purchase requisitions, purchase orders, receiving, material inspections and invoicing
- Management of contracts for purchases and leases as well as warranties, labor and other areas associated with maintenance and repair of materials and services
- Identification of underutilized facilities, simplified strategic facility planning and streamlined move planning and implementation
- Optimized tracking and management of energy use and environmental performance across enterprise facilities and assets
- Management of projects to provide the crucial components necessary to implement building retrofit projects that improve the efficiency of existing facilities and their critical systems
- Support for the ability to clearly demonstrate efforts to comply with government and industry requirements

Solutions for asset and integrated workplace management

IBM solutions support smarter buildings with capabilities targeted at three key areas: energy management, operations management and space management.

IBM Maximo Asset Management

Unifying comprehensive lifecycle and maintenance management on a single platform, IBM Maximo® Asset Management provides insight into enterprise assets, their status and work processes to support better planning and control. From support for asset deployment to enhanced performance visibility to improved asset reliability, this solution can optimize operations management to align service levels with business objectives by defining service offerings and establishing service level agreements. Maximo Asset Management supports asset deployment, specifications, monitoring, calibration, costing and tracking. It enables planning, maintenance and resource optimization based on key performance indicators. It provides management for vendor contracts and inventory to meet maintenance demands.

IBM TRIRIGA Energy Optimization

Building owners and managers need the right tools to optimize energy and enhance operations and reliability. IBM TRIRIGA Energy Optimization provides a comprehensive, easy-to-understand dashboard of vital information such as monthly peak electric demand and energy usage. Scoreboards can be tailored to personnel (such as executives or line of business) or to tasks (such as alerts or work orders). Data filters can also be used to display a wide variety of graphs for visualizing energy consumption and other trends. IBM TRIRIGA Energy Optimization provides adapters for interconnection with existing building management systems such as Johnson Controls Metasys, Siemens Apogee and Eaton Power Expert to accelerate the capture of energy and environmental data from equipment sensors. Analytics capabilities include analytics rules designed to detect suboptimal energy situations and to issue alerts for corrective action for high energy-consuming equipment.

IBM TRIRIGA Real Estate Environmental Sustainability Manager

Organizations need to lower energy costs and generate higher savings from carbon reduction projects. IBM TRIRIGA Real Estate Environmental Sustainability Manager delivers the environmental sustainability software that can help organizations achieve these goals. Powerful, flexible and easy-to-use features identify resource- and carbon-intensive facilities, analyze financial and environmental benefits of environmental sustainability investments, and automate energy reduction actions. With IBM TRIRIGA Real Estate Environmental Sustainability Manager, organizations can streamline carbon accounting and environmental investment analysis to help achieve environmental and energy management goals.

IBM TRIRIGA Facilities Manager

Real estate and facilities assets rank among the four highest costs of business within most organizations, and even small variances in these costs can impact an organization's balance sheet. IBM TRIRIGA Facilities Manager provides advanced space management features to identify under-performing facilities, increase space utilization and reduce occupancy costs.

IBM TRIRIGA Real Estate Manager

Organizations today are looking for ways to generate higher returns from real estate transactions, avoid lease penalties and overpayments, and streamline lease accounting. IBM TRIRIGA Real Estate Manager delivers the real estate management software needed to reduce occupancy costs with capabilities to compare lease and purchase transactions, provide alerting for potential overpayments and automate compliance with FAS 13 and internal audits.

IBM TRIRIGA Capital Projects Manager

In today's capital-constrained economy, organizations face limited financial resources and cannot afford projects that fail to meet planned outcomes. IBM TRIRIGA Capital Projects Manager delivers increased financial returns and accelerates project schedules through advanced project planning and project management features. IBM TRIRIGA Capital Projects Manager identifies priorities for funding allocations, analyzes project risks and financial benefits, and automates project management controls and alerts to deliver ad-hoc projects and programs of any size in an effective manner.

IBM delivers leading capabilities for asset management

At its corporate headquarters in Armonk, N.Y., IBM has implemented its solution for Smarter Buildings that extracts and consolidates more than 7,600 data points from building equipment such as air handlers, chillers, pumps, variable air-volume boxes and heating, ventilation and air conditioning systems. Data analytics and optimization software measure and record performance metrics in real time—automatically prioritizing areas that represented the largest opportunities for energy efficiency and cost savings, and sending automatic alerts when issues occur.

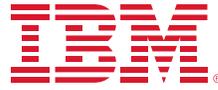
IBM's own transformational experience, consulting expertise, operational and integration best practices, hardware and software technology leadership, and robust partner ecosystems provide the necessary foundation for creating smarter buildings. Using IBM solutions, organizations are better able to maintain facilities equipment proactively, identifying emerging problems and trends to prevent breakdowns, lower maintenance and building management costs, extend asset life through condition-based maintenance and automated notification of issues, and manage energy use.

For more information

To learn more about IBM solutions for Smarter Buildings, contact your IBM representative or visit: ibm.com/smarterbuildings

Additionally, IBM Global Financing can help you acquire the software capabilities that your business needs in the most cost-effective and strategic way possible. We'll partner with credit-qualified clients to customize a financing solution to suit your business and development goals, enable effective cash management, and improve your total cost of ownership. Fund your critical IT investment and propel your business forward with IBM Global Financing. For more information, visit:

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¹ National Science and Technology Council, *Federal Research and Development Agenda for Net-Zero Energy, High-Performance Green Buildings*, October 2008. www.bfrl.nist.gov/buildingtechnology/documents/FederalRDAGendaforNetZeroEnergyHighPerformanceGreenBuildings.pdf

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³ CB Richard Ellis, *Driving an Aggressive Occupancy Cost Reduction Program: A White Paper for Corporate Real Estate*, January 2009. <http://www.cbre.us/services/globalcorporateservices/AssetLibrary/OccupancyCostReductionOCRProgramwhitepaperCBRE0120.pdf>

⁴ IBM, *Crossing the sustainability chasm: strategies and tactics to achieve sustainability goals*, April 2012. ibm.com/common/ssi/cgi-bin/ssi/alias?subtype=WH&infotype=SA&appname=SWG_E_TI_EA_USEN&htmlfid=TIL14006USEN&attachment=TIL14006USEN.PDF



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