



Let's build a smarter planet



**Smart is...**

*Integrating data center equipment and facilities information to reduce energy consumption and promote sustainable, reliable and cost-effective operations*

As part of its partnership with IBM to provide green data center solutions, Johnson Controls is working to monitor, measure and visualize its own data center conditions and energy consumption in real time. This insight identifies inefficiencies within the data center environment and enables staff to make better decisions to dramatically improve data center infrastructure efficiency (DCiE) levels.

## Johnson Controls

*Improving data center infrastructure efficiency (DCiE) levels*

In February 2011, members of Johnson Controls Global Workplace Solutions team saw a spike in energy usage at one of the client data centers it manages. The group supports more than 450 data centers worldwide, including Johnson Controls' own data centers, and manages more than 48 million square feet of data center space.

The dashboard pointed to a problem with a chiller unit on the roof of the building, which technicians quickly confirmed was affected by snow accumulation that morning.

For Johnson Controls, a company that has focused on sustainability for more than a century, the incident highlighted the importance of real-time data on energy usage and events, carbon accounting, and thermal views for data centers and corporate facilities.

“In many cases, data centers manually measure temperatures and air velocity and they do so on only on a quarterly basis,” explains Richard Mueller, manager, Enterprise Data Center Capacity, Johnson Controls. “The challenge is that data can be as much as 90 days old, making it difficult for data center managers to see and resolve problems before energy is wasted or to optimize equipment placement.”

### Managing the data center from chip to chiller

To gain the level of insight needed to enhance energy and operational efficiencies, Johnson Controls is working in partnership with IBM to implement a “green data center” solution in the data centers it manages. The solution helps staff to extract and consolidate thousands of data points from IT systems and supporting facility equipment, such as air handlers, chillers, pumps, and computer room air conditioners (CRACs). Data analytics and optimization software measure and record operational performance against standards and highlight any variances as they occur.





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### Business benefits

- Helped a client improve data center infrastructure efficiency (DCiE) levels
  - Prevents equipment outages by alerting staff to emerging issues and problematic patterns early
  - Helps defer data center expansion by optimizing heating and cooling and improving equipment placement
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*“The green data center solution allows us to make better, smarter choices in real time to increase reliability and uptime of our environment, and reduce operating costs.”*

—Ward Komorowski, Director of Facilities and Building Services, Johnson Controls

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If a variance is detected, a service request is generated and the appropriate personnel notified. Each service request provides technicians with the necessary details regarding the malfunction, the asset’s maintenance history, warranty information and other important asset information. Work orders are prioritized based on the severity of the issue and the impact on energy consumption and building tenants.

“The green data center solution allows us to make better, smarter choices in real time to increase reliability and uptime of our environment, and reduce operating costs,” says Ward Komorowski, director of Facilities and Building Services for Johnson Controls.

Adds John Johnson, manager, Global Application Enterprise Solutions, Johnson Controls, “Together with IBM, we are implementing a solution that can pull all the relevant data together to reduce energy costs, forecast future needs and help data center managers understand the economic and environmental impact of their decisions.”

### Improving data center infrastructure efficiency

According to Johnson, the solution is helping one of its clients:

- Reduce power consumption and avoid potential energy-related disruptions to the data center
- Identify emerging problems and trends to prevent equipment breakdowns, such as addressing heat issues early before servers shut down
- Increase responsiveness to service issues through greater insight into asset conditions and early notification when assets are performing outside of specifications
- Improve decision making regarding data center changes to optimize placement of new systems, reduce the carbon footprint and precisely estimate requirements for data center expansion

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## Smarter Infrastructure:

## Improving sustainability through greater insight



### Instrumented

Sensors, meters and instruments monitor operations of data center equipment and assets, energy use, systems performance and environmental conditions



### Interconnected

Can integrate disparate data from data center and facility assets and display it in dashboards to provide a comprehensive view of data center performance, energy use, costs and carbon footprint



### Intelligent

Advanced analytics detect and diagnose faults well before data center operations are affected, while enabling improvements in equipment reliability and efficiency



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Solution components:

**Software**

- IBM® Maximo® Asset Management for Energy Optimization
- IBM Tivoli® Monitoring for Energy Management
  - IBM Tivoli Data Warehouse
  - IBM Tivoli Common Reporting
- Johnson Controls Metasys® Building Management System

**Services**

- IBM Tivoli Business Development
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—John Johnson, Manager, Global Application Enterprise Solutions, Johnson Controls

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Consider the spike in energy usage that the Johnson Controls Global Workplace Solutions team saw at its client site that snowy winter day. Left unchecked, the data center’s monthly electric bill would have increased substantially and the facility could have experienced an equipment outage that would have affected operations.

“Our ultimate vision is looking at what we call ‘chip to chiller’—an end-to-end solution that addresses both IT and facility components—to understand energy consumption, along with heating, cooling and capacity requirements across the data center,” says Johnson.

▶ **The inside story: Getting there**

*A phased approach...* “The project is broken into four phases,” explains Johnson. “Phase 1 focuses on capturing information so we can measure and benchmark energy usage. Phase 2 focuses on thermal mapping and CRAC efficiency so you can see in real time where hot and cold spots are, adjust cooling capacity to optimal levels, and determine the best placement for equipment. In phase 3, we are setting system rules to monitor performance and events and automate notifications and service requests as needed. Finally, phase 4 will enable data center staff to charge back departments based on consumption of services. IT can see which departments have been using what load on each service and allocate costs accordingly.”

*Planning is essential...* “As part of the planning phase, we need to ensure that all stakeholders have bought into the process, all the way down to which sensors are going to be installed and when,” adds Johnson. “It requires sitting down with IT and facilities to gain their input and design the system to meet the collective requirement. We leveraged the knowledge and know-how and the best applications that IBM had and the IBM team worked with us closely to identify what the opportunities were and how to use the solution to help solve client needs.”

*Building blocks for smarter buildings...* “We look at the green data center as a subset of smarter buildings,” says Johnson. “The beauty is that this solution is designed in building blocks. The insight provided from the data center helped us determine where the immediate need and focus was. However, we can and do apply this same approach and technology to create smarter buildings.”

## For more information

To learn more about the combined solution for data centers offered by IBM and Johnson Controls, contact your IBM or Johnson Controls representative, or visit: [ibm.com/ibm/green/index.shtm](http://ibm.com/ibm/green/index.shtm), [ibm.com/press/us/en/pressrelease/29483.wss](http://ibm.com/press/us/en/pressrelease/29483.wss) or [www.johnsoncontrols.com](http://www.johnsoncontrols.com)



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Somers, NY 10589  
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