



# IBM Data Center Virtualization Project

## Case Study

Sector:  
Data Centers

Company:  
IBM

Location:  
Edicott and Poughkeepsie, NY

Measures Implemented:  
• Server consolidation  
• Virtualization

Energy Savings Results:  
4,259,813 kWh of electricity

Using this experience, IBM is developing a repeatable methodology to help clients with their own data center energy efficiency projects.

## Background

Companies implement energy efficiency projects for many reasons: to reduce energy consumption and its impact on the environment, or to address the concerns of clients, regulatory agencies, and the public. However, an equally compelling reason for efficiency projects is financial. Reduced power consumption brings lower energy costs. Beyond the direct savings of buying less power, financial incentives from governmental agencies and power utilities often improve the return-on-investment for energy efficiency projects. But to take advantage of these programs, companies are required to measure and document energy efficiency gains.

IBM®, an innovator in the development and manufacturing of IT-related hardware, software, and business solutions, is a leader in data center energy efficiency and cooling. The company wanted to improve the efficiency of its data centers in New York. The initial focus was on the company's Edicott and Poughkeepsie locations with 186,000 square feet of data center space that provide for 7.6 MW of IT load serving both internal IBM users and commercial hosting clients.

## Recommendations

To maximize the scope of the project with the limited capital funds available, IBM identified various state and utility programs that would pay significant incentives for server consolidation and virtualization projects planned in 2010 and 2011. New York offers incentives for IT energy savings measures, which influenced IBM's decision. In New York, IBM can earn 12 cents/kWh saved through NYSERDA Industrial and Process Efficiency program support for the projects in Edicott and Poughkeepsie. This support allowed IBM to plan additional work over the course of the two-year project. The Poughkeepsie site has been an active participant in past NYSERDA programs. Using this experience, IBM is developing a repeatable methodology to help clients with their own data center energy efficiency projects.

“The NYSERDA support is a primary factor in selecting the NY-based servers for virtualization rather than servers located in states without such programs. Furthermore, it increases the total affordability of our consolidation and virtualization program, allowing us to do more with our limited investment resources.”

— John Adams, IBM, CHQ,  
*Enterprise on Demand*

## Results

IBM designed the 2010 Enterprise Computing Model (ECM) project to reduce annual electric consumption. In its Endicott and Poughkeepsie data centers, IBM targeted every server for potential virtualization and consolidation. By looking at the overall data center workload instead of using the typical application-by-application approach, the IBM team was able to identify and remove powered-off and under-utilized servers, resulting in significant power savings. IBM used a fit-for-purpose methodology to determine the best target environment. As a result, 50 percent of existing servers were migrated to IBM System z™ mainframe servers, the most energy-efficient platform. As a final step, all unused servers and peripherals were decommissioned and unused floor space was made available for other purposes.

IBM collaborated with Neuwing Energy Ventures to assist with design and implementation of the measurement and verification plan, and to coordinate efforts with NYSERDA’s technical review firm, L&S Energy. The verification efforts consisted of circuit-level metering of IT electric load combined with energy reporting delivered by a state-of-the-art power usage effectiveness (PUE) tracking tool implemented by the IBM facilities team. The company realized a savings of 4,259,813 kWh. NYSERDA support offset capital improvements and improved the payback by more than one year.



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