

# IBM Data Center Virtualization Project

## Poughkeepsie, NY

### Background

There are many reasons companies implement energy-efficiency projects: 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. Obviously, reduced power consumption brings lower energy costs. Beyond the direct savings of buying less power, there are financial incentives from governmental agencies and power utilities that often improve the return-on-investment for energy-efficiency projects. But in order 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 Endicott 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.

***“The NYSERDA incentive 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*

### Program Recommendations and Incentives

In order 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. In New York, IBM can earn 12 cents/kWh saved through NYSERDA Industrial and Process Efficiency program incentives for the projects in Endicott and Poughkeepsie. By providing such a meaningful difference in project payback periods, these incentives allow IBM to plan additional work over the course of the two-year project. The IBM Poughkeepsie site has been an active participant in past NYSERDA programs and with the Industrial and Process Efficiency program, funding is now available for data center improvement projects, not just facility infrastructure. Using this experience, IBM is developing a repeatable methodology to help clients with their own data center energy-efficiency projects.

## Metrics and 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 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 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. IBM's implementation of the two-year project is progressing as planned with work nearly complete in Endicott and continuing in Poughkeepsie. The company estimates it will realize an annual energy savings in excess of 9 million kWh upon project completion. With NYSERDA incentives of \$1,084,800 offsetting the cost of these capital improvements, the payback of the project improves by over a year.



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