



MULTIPLE DATA CENTER EFFICIENCY MEASURES SAVED \$1.7 MILLION AT BNY MELLON'S NORTHERN PENNSYLVANIA PROCESSING CENTER

BNY MELLON'S COMMITMENT TO REDUCING DATA CENTER ENERGY USE

BNY Mellon is a leading investment management and investment services company with \$26.6 trillion in assets under custody or administration. BNY Mellon's 71,000 square-foot Northern Pennsylvania Processing Center (NPPC), built in 2006 and located north of Pittsburgh, is part of a network of data centers that process over a trillion dollars in transactions per day. Understandably, given these circumstances, managers of financial institution's mission-critical data centers typically tend to be risk-adverse and uptime-focused and not as concerned with efficiency.

However, BNY Mellon, a leader in sustainability among financial institutions, has long demonstrated a significant commitment to the environment. For example, in 2011, 49 percent of the real estate owned and operated by BNY Mellon was ENERGY STAR qualified. BNY Mellon has reduced their internal copy paper usage by 28 percent since 2008 and offset 75 percent of its domestic electricity consumption in 2009 through renewable energy investments.¹

For data centers, BNY Mellon has tracked energy performance at all its data centers since 2006 through its Power Usage Effectiveness (PUE) program. PUE is a data center efficiency metric that equals total power usage of a data center divided by the power used to run the IT infrastructure. Data center efficiency improves as PUE decreases toward 1.

Due to its PUE program, NPPC became the second data center ever to earn the ENERGY STAR Buildings designation in 2010 and has saved \$1.7 million since 2006.

"BNY Mellon has had a significant commitment to environmental sustainability and operational efficiency and reliability for quite some time. But these things don't happen without a lot of focused attention and organizational effort. We look at the return on investment as well as the opportunity to make lasting changes that will reduce our overall environmental footprint. This approach brings our employees, management and supplier partners a real sense of satisfaction."

- Dan Gaffney, Director of Critical Infrastructure Group, BNY Mellon

NPPC'S EFFICIENCY UPGRADES

BNY Mellon's PUE program led to the examination of many energy reduction opportunities at NPPC by the Critical Infrastructure Group. Upgrades were only considered if they yielded a complete return on investment (ROI) of less than three years. As with many data center retrofit improvements, the efficiency upgrades at NPPC were also tied to data center

¹ BNY Mellon Corporate Social Responsibility Report (www.bnymellon.com/about/csr/2011/csr.pdf).

capacity expansion. Ultimately, BNY Mellon's Critical Infrastructure Group implemented the following energy efficiency upgrades:

- Installing variable speed drives (VSDs) on fan systems that led to an overall 25% reduction in fan speed and a 58% reduction in overall fan system energy use.²
- Fitting hot air collars at the server outlet that directed hot server air to a return air ceiling plenum. Additional air flow management measures such as blanking panels and grommets were also installed.
- Increasing the temperature of supply air to the servers from 72 to 78 degrees F. These higher temperatures allowed BNY Mellon to increase the chilled water temperature from 44 degrees to 47 degrees F, thus decreasing the energy and cost to cool the water.
- Changing the humidification set points from 40% to 45% relative humidity (which varies with temperature) to 41.9 to 59 degree F dew point (an absolute humidity value) as recommended in new ASHRAE guidance. This change in humidity measurement parameters and humidifier control reduced adiabatic humidification run-time from 80% to 20% of the time.

In addition, the Critical Infrastructure Group evaluated the benefits that would be derived from the installation of a water-side economizer. Water-side economizers allow for free cooling (without the use of the chiller) when outdoor temperatures are low. As often is the case with water-side economizer retrofits, the capital costs for the equipment upgrades outweighed the energy savings leading to a payback of 14 years. One of the major lessons from this project was that a water-side economizer did not meet BNY Mellon's ROI criteria.

THE RESULTS

As a result of the energy efficiency upgrades, NPPC :

- Became the second data center ever to earn the ENERGY STAR Buildings designation in 2010.
- Improved its PUE score from 2.0 in 2008 to 1.52 in 2012.
- Saved 24 million kWh or \$1.7 million dollars since the PUE program's inception in 2006.



Beyond NPPC, BNY Mellon's Enterprise Data Center PUE program has saved over \$12 million dollars (160 million kWh total) since 2006.

KEY FINDINGS

In addition to the cost-benefit analysis yielding the desired criteria of less than three-year ROI, Mr. Gaffney believes that there were several other organizational issues that were essential to the successful completion of these upgrades, including:

- **Having top-down commitment.** BNY Mellon's Corporate Socially Responsible Committee resides within the Board of Directors and has overall responsibility for BNY Mellon's sustainability efforts. Without upper management's support of these efforts, the upgrades would never have occurred.
- **Using a local team.** A local team, comprised of BNY Mellon's Critical Infrastructure Group and their property management and design engineering firms, was brought together and empowered to make the appropriate efficiency and sustainability decisions. This was essential to the project's success.

² Since fan power draw is proportional to the cube of fan speed.

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