

2011 Data Center Technical Market Report



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Special points of interest:

- [Leading Data Center Trends](#)
- [Data Center Market Reports](#)
- [Data Center Construction Report](#)
- [Trading Industry Reports](#)
- [Power and Site Selection Reports](#)

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2011 Leading Data Center Trends

While "Green" data centers will continue to be a trend within the industry, technology is also driving infrastructure upgrades that perhaps have never been seen before. Blade Technology has been in the market place for five years, and only until recently virtualization software along with Blade servers has created a real opportunity for the enterprise users to recognize financial benefits. The combined technologies create opportunities to consolidate multiple data centers into a more efficient centralized data center.

Several data centers still exist that were designed at 50 watts per square foot. Due to the combination of Blade technology and Virtualization software, new data centers that

support this platform are being designed for 200 watts per square foot (critical load).

As with many trends, the financial industry is one of the first to take advantage of this technology and consolidate multiple data centers into a single environment.

While the Blade/Virtualization trend is occurring, we are also seeing enterprise companies beginning to embrace the Collocation Wholesale market. Historically, enterprise users typically prefer to own their data centers. However over the last two years there has been a significant surge in the relocation to Wholesale Collocation providers. This is due to the intense capital outlay required to build their own data



centers, versus the long-term investment as an operating cost.

ESD anticipates both trends will greatly impact infrastructure construction 2011 through 2016.

2011 Midwest Data Center Market Report

There is an estimated pent up demand for 55-60 MW of power within the Chicago Data Center Market. Recent absorption includes Server Farm Realty's 840 South Canal 20MW wholesale data center. Other area (non urban) data centers include:

- DuPont Fabros data center expansion (4MW)
- Ascent Data Center (4MW)
- Digital Capital (4MW)

With 30 MW of demand remaining, developers are in a race to create programs to enter the market.

Chicago's electronic trading data center market continues to grow with an anticipated need of approximately 35,000 sf beyond current capacity. Illustrating the need for this highly specialized data center space is the minimal amount of electronic trading data center space remains available for lease at 350 Cermak in Chicago, Illinois.

For additional information, please see *Traders Market Report* enclosed.



350 Cermak, Chicago, Illinois



Google's New Data Center
111 8th Street
New York, NY
2.9M sf

2011 National Data Center Market Report

The national data center market will remain strong throughout 2011, spurred by a lack of existing infrastructure to support technology trends within the Collocation, Enterprise, and Financial markets.

West Coast Market:

- Recent development in Santa Clara, California (Coresite and others) and the Bay area have provided relief for collocation tenants.
- San Diego Market has also begun to compete with LA and San Francisco offering

recent data center development.

Southwest Market:

- Dallas has excess capacity and growth remains slow.
- Phoenix offers abundant capacity through IO data centers and other facilities.

East Cost Market:

- Reston, VA has excess supply and new construction will be minimal for a few years.
- Several companies are migrating off of the eastern grid to find more reliable power.

States and Cities projected to see growth throughout 2011 include:

- St. Louis, MO
- Washington State
- Chicago, IL
- Boston, MA
- Minneapolis, MN
- Denver, CO
- San Diego, CA
- Charlotte, NC

Expect more DC construction activity within Tier I and Tier II cities due to Cloud computing.

Expect a 3.8% increase in building materials costs and a 4-6% increase in overall data center cost in 2011

2011 Data Center Construction Cost Report

Construction costs will continue to rise as activity increases throughout 2011. Levels should be consistent with 2008 Q3 costs, recovering from recent downturns in the market (-13.16%). Labor costs will remain consistent (+3.2%) with 2010 levels which were competitive. Commercial real estate construction is projected to increase by 5% having mini-

mal impact on construction labor costs in 2011 over 2010.

Factors for projected data center construction cost increase:

- More stringent EPA regulations for generators in several states.
- 4-6% attributable to emissions, copper, steel, and labor force.
- 1-2% for green factors.

- Materials Cost +3.8%
- Labor Cost +3.2%

Tier III data center construction cost will range between \$1,100 - \$1,500 per square foot (depending on design).

Greenfield data center activity should remain similar to 2008, Q3 levels.



Server Farm Realty
840 South Canal

2011 Mega Data Center Project Report

2010 was a strong year for Mega Data Center construction projects. This was spurred by new technologies, cloud computing, and government construction. Projects included eBay, Apple, Yahoo, US Army, and NSA.

Google recently purchased the 111 8th Avenue Carrier Hotel in Manhattan for approximately

\$1.9B. The facility is 2.9M sf, housing 500,000 sf of office.

The largest project announced to date in 2011 is the Server Farm Realty project located at 840 South Canal, Chicago, Illinois. This project (designed by ESD) is 450,000 sf and will house over 130,000 sf of raised floor. The facility will also support an electronic trad-

ing environment of 80,000 sf.

The building will be supported by twenty (20) 2,250 to 2,500 kW generators and 37MW of power. The facility is slated to come on line September 1, 2011 and is currently under construction. With the current demand in Chicago, it is anticipated to lease up quickly.

2011 M&A Data Center Market Report

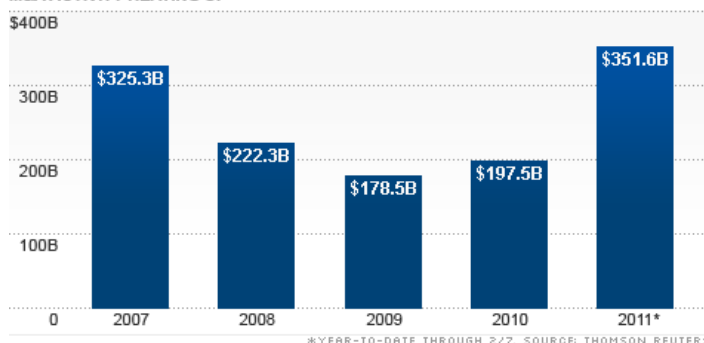
The M&A (Mergers & Acquisitions) market is expected to grow significantly throughout 2011 as the U.S. Dollar rises and companies seek high-growth strategies to increase profits. Thompson Reuter indicated 2010 M&A activity of \$197.5B and predicts a total of \$356.6B of M&A activity in 2011.

As activity within this market increases, expect data center consolidations to increase within merged companies by upwards of 70%.

M&A, coupled with Blade technology and Virtualization software, will create opportunities to further consolidate joint operations therefore increasing shareholder value. Top Industries targeted for M&A include:

- Pharmaceuticals - Continues to be strong (#1 in 2010)
- Technology Sector - Strong
- Retail - New activity
- Financial Industry - Strong

M&A ACTIVITY HEATING UP



Leading 2010 Midwest M&A:

- UAL / Continental Airlines
- Aon / Hewitt Associates

2011 Electronic Traders Market Report

Within 2009 and 2010 the electronic trading market has led the highest real estate transactions per industry. Chicago leads the market averaging 1.1M sf per year (2007 - 2010) respectively.

Due to electronic trading requiring a higher level of support infrastructure, existing office buildings typically require infrastructure upgrades to meet support power require-

ments needed for electronic trading. New construction offering 20-30 watts per square foot and clean / reliable power is required to sustain demand. Existing buildings require extensive upgrades, and speculative trading environments are being planned. Chicago alone has over 8M sf of trading space, with an anticipated 1.2M sf of speculative development. Expect additional activity within companies

supporting the trading industry such as software developers and trading industry consultants.

Leading transactions during 2010 included DRW, Getco, Chicago Trading Company, BMO Capital, and BP North America. Accumulative transactions equaled over 1.2M sf in 2010.

Existing buildings require extensive upgrades, and speculative trading environments are being planned.

2011 Enterprise Data Center Market Report

The Enterprise data center market is expected to increase dramatically between 2011 through 2016. New data center space is anticipated to support new technologies and replace antiquated existing infrastructure that will not support projected growth. Opportunities for meaningful consolidation exist within Fortune 1000 companies that have multiple data centers. In addition, we are seeing trends that enterprise

companies are migrating to collocation facilities due to capital outlay required for new construction.

Expect new "green incentives" for enterprise data center users to materialize throughout 2011. Enterprise users should be aware of new EPA regulations planned for 2012. If new data centers are required, consideration should be given to cooler climates and reliable

power (see site selection report).

Gartner Group reports that over 45% of existing data center users will need new data centers within the next three years.

Expect more HPC (High Performance Compute) activity within the University sector.



Allstate Insurance Data Center Consolidation
Blade Technology / Virtualization Software
Green Data Center of the Year, DeCAY Awards

2011 Data Center Blackouts and Disaster Prevention Report

The 2010 Eaton Blackout Report has similar results to 2008 and 2009. The Top 10 states with the most blackouts has been consistent from one year to the next. The 2010 Top 10 blackout states include some of the states that house the most data centers. These states are (number of reported outages):

1. California (508)
2. New York (176)
3. Texas (145)
4. Ohio (135)
5. Washington (125)
6. New Jersey (121)
7. Pennsylvania (120)
8. Florida (118)
9. Michigan (116)
10. Wisconsin (106)

While there has been talk about Smart Grid, little has changed within the data center industry. While the government

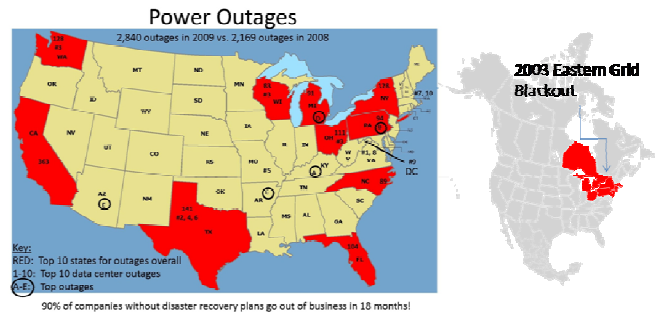
has provided incentives to utility companies to upgrade infrastructure, progress has been slow. Comparisons of the 2003 Rolling blackout on the eastern grid show little progress in comparison to the Eaton Blackout Report of 2010.

Excess capacity for data center construction is still limited. Michigan capacity remains good due to closed manufacturing plants

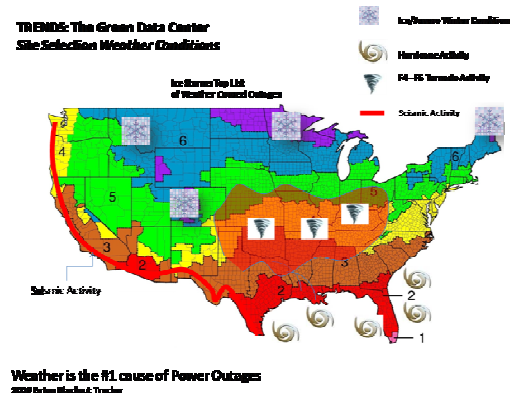
Other states that indicate good capacity include:

- Illinois
- Utah
- Colorado
- Kentucky
- Missouri
- North Carolina
- Washington

TRENDS: The Green Data Center Site Selection Data Center Power Issues



TRENDS: The Green Data Center Site Selection Weather Conditions



2011 Data Center Site Selection Report

Forward Looking Statement

There are several factors that contribute to site selection for data centers. These include; cost of power, reliable infrastructure, property taxes, free cooling, demographics, and disaster prevention criteria.

As companies relocate / consolidate data centers, consideration should be given to migrating off of unreliable utility infrastructure, to more robust inexpensive utility infrastructure. This coupled by cool temperatures, and disaster prevention (hurricane, seismic, etc.) limit areas of relocation.

Discussions are taking place among site selection professionals to identify areas where

free cooling is plentiful, along with reasonable utility prices. With this said, ESD anticipates data center migration away from utility grids such as California, Texas, and the East Coast, to cooler and more reliable regions.

Examples include:

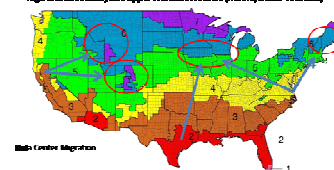
- California data centers to Denver, Washington, higher altitudes (Reno, etc.)
- Texas data centers to North areas of Midwest such as Illinois, Indiana, and Missouri
- East Coast data centers to Vermont, Massachusetts, and other areas off of the East Coast Grid.

As an example of the challenges associated with migra-

tion, Google recently purchased a large 160 MW wind farm utility plant in North Dakota. This site offers abundant free cooling, and extremely cost effective wind power. However, living in North Dakota is not appealing to many IT personnel, but new development may help spawn this effort.

We are also noticing areas of Canada are being considered among the larger users.

- Companies must upgrade infrastructure to support 24x7x365 data centers
- Companies must upgrade off of the Eastern Power Grid to cool for reliable climate
- Companies must upgrade the power and fiber systems, a single cable for 47 miles
- California to migrate off of the CA Power Grid to cooler reliable climate
- Potential areas for data center migration away Midwest states, Ohio, Michigan states, and upper West Coast states (Wyo, WVa, Nev, Ariz)



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- Resources:**
- ENR Construction Index
 - Turner Construction Index
 - Thompson Reuters
 - Gartner Group Research
 - US Government Labor Index
 - Eaton Blackout Report 2010
 - US Weather Bureau
 - ASHRAE

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