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ENERGY STAR for Data Centers Scheduled Portfolio Manager Release on June 7, 2010

EPA's energy performance rating system helps energy managers assess how efficiently their buildings use energy, relative to similar buildings nationwide. Organizations can obtain energy performance ratings through [Portfolio Manager](#), an interactive energy management tool that allows users to track energy and water consumption of buildings in a secure online environment. The energy performance of a building is expressed on a 1-to-100 scale — a rating of 50 indicates that the building performs better than 50% of all similar buildings, while a rating of 75 indicates that the building performs better than 75% of all similar buildings.

EPA has developed a 1-to-100 energy performance rating for data centers, which will be released in Portfolio Manager on June 7, 2010. To develop the rating, EPA collected data on energy use and operating characteristics from a large number of existing data centers. The statistical regression analysis employed for all of EPA's energy performance rating models was then applied to the data set, resulting in a rating that is applicable for both standalone data centers and larger buildings that contain data centers.

Overview of the Data Collection Process

In late 2007, EPA began working with stakeholders and industry leaders to identify the appropriate operating characteristics and energy data to be included in the survey. Data was collected during the period from March 2008 through June 2009. Participants provided at least 11 months of energy consumption data, as well as a number of operating characteristics that would allow EPA to make adjustments to the rating for operating constraints outside of the owner or operator's control. By the summer of 2009, EPA had collected complete data from 120 data centers representing various sizes, types, and locations.

Benchmarking Methodology for Data Centers

In collaboration with industry leaders and associations, EPA selected the Power Usage Effectiveness (PUE) as the metric to evaluate data center energy performance. The PUE is a standard industry metric, equal to the total energy consumption of a data center (for all fuels) divided by the energy consumption used for the IT equipment. The PUE generally ranges from 1.25 to 3.0 for most data centers. The PUE is computed in terms of source energy, which is the most equitable way to compare buildings that utilize different fuel types.

EPA used statistical regression analysis to identify the operating characteristics that explain the variation in PUE among data centers. Of the numerous variables analyzed, only the annual IT energy consumption was found to be statistically significant in explaining the variation in energy use; data showed that facilities with higher IT energy consumption have lower PUE values, on average. The final regression model predicts a PUE value based on the IT energy. For a given facility the actual measured PUE can be compared with this prediction. A facility whose actual PUE is lower than the predicted PUE is doing better than average. This performance level (actual compared with predicted) is mapped to a 1-100 scale such that one point represents one percent of the population. The final rating model is applicable for standalone data centers and larger buildings (such as offices) that contain data centers. A Portfolio Manager user must enter the data center as a separate space within a larger building to obtain a rating for the entire building.

Benchmarking Buildings with Data Centers

The data center space type is intended for sophisticated computing and server functions which typically include high density computing equipment, dedicated cooling systems, and uninterruptible power supplies (UPS). Server closets and computer training areas do not qualify. To benchmark a building with a data center, users need to begin recording annual IT energy in addition to total building energy. EPA defines annual IT energy as the total energy consumed by the server racks, storage silos, and other IT equipment as measured at the output of the UPS. If there is no UPS system, or if the UPS system contains other non-IT loads (such as cooling equipment), IT energy can be measured at the input to the Power Distribution Unit (PDU). Buildings with data center(s) that are less than 10% of the floor area may have Portfolio Manager apply estimated data if metering is not in place on June 7; estimates will only be permitted for two years.

For More Information: Visit www.energystar.gov/datacenters or email ENERGYSTARdatacenters@icfi.com