

MANAGEMENT MEMO

NUMBER: MM 14-09
DATE ISSUED: October 10, 2014 Form 408 revised 10/2017
EXPIRES: UNTIL RESCINDED
ISSUING AGENCY: DEPARTMENT OF GENERAL SERVICES

SUBJECT:
**ENERGY EFFICIENCY IN DATA CENTERS AND
SERVER ROOMS**

REFERENCES:
[Executive Order B-18-12 Green Building Action Plan Section 10](#)
[PUE Calculations IEEE 802.3-2012-Section Six Title 24 Building](#)
[Energy Efficiency Standards](#)

Purpose This Management Memo provides direction to all state agencies to meet data center and server room energy efficiencies as required in the Green Building Action Plan Section 10.7. This plan implements Executive Order B-18-12.

Policy State agencies will achieve energy operating efficiency in data centers and server rooms in state-owned and state-leased buildings.

Who is Affected All state agencies under the definition of Government Code Section 11000: (a) As used in this title, "state agency" includes every state office, officer, department, division, bureau, board, and commission. It is requested that entities of state government not under the Governor's direct executive authority also implement similar measures.

Requirements By December 31, 2014, all state-owned and leased data centers and server rooms greater than 200 square feet shall be operated within the 2011 ASHRAE - TC 9.9, Class A1 – A4, recommended guidelines for temperature and humidity in addition to all applicable 2013 Title 24 Building Energy Efficiency Standards. In most cases it will not be necessary to control humidity and/or dew point in order to stay within the specified ASHRAE- recommended guidelines. If this becomes a problem, the Department of Technology can assist agencies by recommending solutions.

Temperature and humidity in data centers and server rooms shall be measured at the information technology (IT) equipment air inlets for temperature and humidity compliance. It is recommended that supply air inlet temperatures in data centers remain in the 23 to 27 degree Celsius (C) (73 to 81 degrees Fahrenheit) range.

Class	Equipment Environmental Specifications	
	Product Operations	
	Dry-Bulb Temperature (°C)	Humidity Range, Non-condensing
A1 to A4	18 to 27	5.5°C Dew Point to 60% Relative Humidity and 15°C Dew Point

Continued

**Requirements
(cont.)**

1. All state data centers that exceed 1,000 square feet shall measure and report their power usage effectiveness (PUE) annually by December 31 (beginning December 31, 2014) to the Department of Technology using the Power Usage Effectiveness Report ([TECH 408A \(Air Cooled\)](#) or [TECH 408B \(Chilled Water Cooled\)](#)ⁱ. For agencies whose cooling is supplied through the downtown Sacramento Central Plant, the Department of Technology can provide specific instructions for the calculations. Agencies are responsible for submitting these reports, and must base their PUE calculations on the criteria outlined in the [Green Grid publication](#)ⁱⁱ

Data centers that exceed a PUE of 1.5 shall reduce their PUE by a minimum of 10 percent per year until they achieve a 1.5 or lower PUE. These reductions can be achieved through energy saving measures and/or through scheduled and budgeted power and cooling supply equipment replacements. If agencies that manage data centers 1,000 square feet or larger do not have the expertise to reduce PUE, the Department of Technology can provide suggestions. The Department of General Services and local utilities also are excellent resources to suggest energy savings measures.

2. When purchasing network switches and routers, all state agencies must specify the Energy Efficient Ethernet IEEE (Institute of Electrical and Electronics Engineers) 802.3-2012 Section 6 standard to the maximum extent possible. (Download a free copy of this IEEE standard from (the [IEEE Standards Association](#)).
3. All state agencies must consider virtualization options when refreshing equipment or standing up new systems. Virtualization is the creation of a virtual rather than actual version of something such as an operating system, a server, a storage device, or network resources. Use of the most energy efficient power supplies available should be included in the purchase of new IT equipment.

Questions

If you have questions about this directive, please contact:

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Signature

Fred Klass, Director
Department of General Services

ⁱ TECH 408 Report form was divided into two forms in December 2015.

ⁱⁱ The Green Grid publication is considered proprietary information and therefore it cannot be provided as a direct link. Departments must register at the Green Grid website to obtain this free publication.

Sustainable Building Working Group
Questions and Answers from November 4, 2014 Webinar

Updated 12.18.15

MM 14-09 Energy Efficiency in Data Centers and Server Rooms

(Answers provided by Department of Technology)

1. Question: Please provide a definition for Data Center/Computer Room.

Answer:

A data center is generally a building or room designed and dedicated for the support of data processing. A data center is a facility used to house computer systems and associated components, such as telecommunications and storage systems. It generally, but not always, includes redundant or backup power supplies, redundant data communications connections, environmental controls (e.g., air conditioning, fire suppression) and various security devices.

2. Question: Will PUE reporting deadline become your baseline year?

Answer:

Management memo 14-09 will be an annual requirement for all departments under the Executive Branch. Departments who reach the goal of a PUE at or under 1.5 will still be required to submit their PUE information in subsequent years to verify that their PUE meets the requirements of the management memo. Note PUE reporting is only required for Data Center/Computer Room/Server Rooms over 1000 square feet in size.

3. Question: Which form do I use, TECH 408A or 408B? (updated 12.18.15)

Answer:

If your data center is air cooled, please use TECH 408A. If your data center is water cooled, please use TECH 408B

4. Question: Where do we send the completed form? (updated 12.18.15)

Answer:

TECH 408a and TECH 408B are designed to be completed and submitted online. When you click on the SUBMIT button, the form will be sent to the correct place.

5. Question: After data is collected from state agencies what will the Department of Technology do with the information?

Answer:

The information will be compiled and a report will be generated and submitted to the state CIO. The report will include the department name, the PUE reported, and a summary of energy efficient efforts planned by the department to lower their PUE. The Department of Technology will track departments' efforts to meet or maintain the PUE goal of 1.5 or better.

6. Question: Because Management Memo 14-09 requires reporting for leased property (as well as state owned) and many leased spaces are not sub metered at the data center level, how are agencies supposed to gather the necessary data for data center input and PUE reporting? Typically private sector Lessors do not allow the state to work on their building (they probably will not allow the State to access their electrical panels due to liability concerns, as well as the 2012 NFPA 70E requirements). If no data is available from the Lessor, during this reporting period (data due 12/31/14) what should agencies do? Should they indicate that sub. meters are not installed at the privately owned space, consequently no PUE reporting is possible? _Please advise.

Answer:

A data center of over 1000 square feet uses a significant amount of energy. Reporting for state leased data centers over 1000 square feet is still required. If the facility's BMS and/or the electrical and mechanical distribution equipment cannot provide the necessary data, a licensed electrician can access electrical panels and record amp clamp readings and or readings directly from computer room air conditioners necessary for PUE calculations.

7. Question: Is DGS redrafting its standard lease agreement to make it a requirement for lessors to sub meter data centers and server rooms and provide energy use data, dry bulb temperatures and humidity compliance data to the state (Lessee) consistent with this new MM? This would seem to be a necessity if the state wants to consistently capture the data for leased buildings.

Answer:

For facilities with a data center 1000 square feet or greater, if hiring an electrician to record readings on behalf of state departments proves problematic, RESD can be consulted to determine if any changes need to be made to the lease.

Changing the standard lease agreement will not be necessary as monitoring temperature and humidity can be done with a simple monitoring gauge. Because of recent technology advances, and governor directives, there have been no new data centers over 1000 square feet built in the past several years, and no new ones planned.

8. Within each agency, who is the responsible party for reporting? It appears that the CIO is the signature authority on Form TECH 408, which suggests that the CIO is the responsible party. Please confirm.

Answer: The department CIO is the responsible party for signature authority.