



Drivers to Reduce Energy Waste in Updated Data Center Optimization Initiative

This factsheet provides a summary of practices to reduce energy waste based on the Office of Management and Budget (OMB) updated guidance on the Data Center Optimization Initiative (DCOI). This factsheet highlights key considerations and updates to DCOI requirements, including reporting requirements and guidance on data center consolidation and closure, infrastructure management, other recommendations, and performance metrics.

In June 2019, OMB released Memorandum M-19-19 that contains requirements for the consolidation and optimization of Federal data centers in accordance with the Federal Information Technology Acquisition Reform Act (FITARA). Memorandum M-19-19 rescinds and replaces OMB Memorandum M-16-19. Memorandum M-19-19 targets key areas where agencies can make meaningful improvements and achieve further cost savings.

This factsheet reflects the Lawrence Berkeley National Laboratory Center of Expertise for Energy Efficiency in Data Centers' interpretation and is not an official document or endorsed by OMB. Please reference the [full OMB Memorandum](#) for complete guidance. Federal agencies may have requirements in addition to M-19-19 and should check with the agency's Chief Information Officer for further guidance.

DCOI Requirements

OMB establishes deadlines, requirements, and metrics for the following reports and reviews the progress of each agency. The head of each Agency must submit the documents below to OMB annually.

- ✓ **A comprehensive inventory of data centers closed/consolidated, owned, operated, or maintained by or on behalf of the agency.**
- ✓ **A Strategic Plan for achieving consolidation and optimization of these data centers.**
- ✓ **Quarterly updates on progress – including activity completion, closure/consolidation & optimization metrics, and realized savings and avoidance through strategy implementation as defined in the [Quarterly Instructions for Integrated Data Collection](#).**

Resources for Implementing DCOI

[GSA's Data Center and Cloud Optimization Resources page](#) can help you make decisions about data center and cloud optimization. Questions? Contact dccoi@gsa.gov

[The Center of Expertise for Energy Efficiency in Data Centers](#) provides tools, trainings, technical assistance, and other resources.

- Estimate PUE and receive tailored recommendations with the [Profiling Tools](#)
- Implement a metering system with the [Metering Guide](#)
- Identify energy conservation measures (ECMs) with the [Master List](#)
- Become a registered [Data Center Energy Practitioner \(DCEP\)](#)
- Questions? Contact us at coe@lbl.gov or visit us at DataCenters.lbl.gov

* View resources on reporting requirements and strategic planning [here](#).

Prioritization of Concerns & Updates to Policy

Against a backdrop of increasing agency computing needs, agencies should consider opportunities for investments that may yield long-term savings through reducing energy waste, as well as reduce total cost of ownership. Agencies should consider their mission goals first, and then prioritize data center consolidation and closures, followed by optimization. Energy waste reduction considerations based on DCOI requirements include:

Consolidation & Closure of Existing Data Centers

- Agencies shall continue to reduce application, system, and database inventories to essential enterprise levels by increasing the use of virtualization to enable pooling of storage, network and computer resources, and dynamic allocation on-demand.
- Agencies shall evaluate options for the consolidation and closure of existing data centers in alignment with the Federal Cloud Smart strategy.
- Agencies shall evaluate migration options, including: (1) Provisioned services, including cloud technologies (2) Inter-agency or intra-agency shared services, or co-located data centers; and (3) More optimized data centers within the agency's existing data center inventory.
- OMB will continue to set agency-specific goals for data center closures and cost savings that are appropriate to the mission and budget for each agency.

Automated Infrastructure Management

- Agencies should continue to replace manual collection and reporting of operational data with automated monitoring, inventory, and management tools (e.g. Data Center Infrastructure Management - DCIM).
- Agencies are strongly encouraged to implement automated monitoring and management tools throughout their data centers (especially those in excess of 100 kW).
- Agencies must include automated infrastructure management requirements for all new data center service contracts or procurement vehicles.

Project Financing & Procurement

- Agencies are encouraged to utilize utility energy service contracts (UESC) and energy savings performance contracts (ESPC) to finance energy improvements. *Access resources on [ESPC](#) and [UESC](#) financing.
- Agencies should consider EPEAT-registered servers when upgrading or replacing hardware to maximize efficiency. EPEAT-registered servers must be ENERGY STAR certified and should support ASHRAE Class A2 (or higher) allowable operating range. *Access the [EPEAT registry](#) or [ENERGY STAR product finder](#).

Updates to Performance Metrics

DCOI's performance metrics as outlined in M-19-19 are shown below. Consult the [OMB memorandum, Strategic Plan Metrics](#), and the [Quarterly Instructions for Integrated Data Collection](#) for full information.

Metric	Description	Notes
Virtualization	<ul style="list-style-type: none"> ✓ Agencies are required to report the number of physical servers or mainframes dedicated to providing a virtualization layer to guest operating systems in their agency-managed data centers. 	Agencies may report systems under their cloud investments towards this total count. *Access Cloud Services or the IT Application Rationalization Playbook .
Advanced Energy Metering	<ul style="list-style-type: none"> ✓ Agencies are required to report if each data center in its inventory has advanced energy metering covering the majority of its space. ✓ Agencies are expected to have advanced energy metering and sub-metering sufficient to accurately estimate Power Usage Effectiveness (PUE) for all data centers > 100 kW that are planned to remain open. 	Agencies will be able to request an exemption for individual facilities where it is too costly to install monitoring.
Energy Efficiency	<ul style="list-style-type: none"> ✓ Agencies are required to report average electricity usage and average IT electricity usage for each data center in its inventory. 	Include improvement in PUE over time
Server Utilization	<ul style="list-style-type: none"> ✓ Agencies are required to report on underutilized production servers in each data center in its inventory. ✓ Agencies shall provide their own definition of "underutilized", based on mission and service needs. ✓ In reporting the number of underutilized servers, agencies should use automated monitoring software to measure application usage to determine needs. 	OMB expects agencies to consider CPU usage and storage space at a minimum.

*See [GSA's Optimization Metrics page](#) for resources on each of the metrics listed above.