

U.S. Department of Health and Human Services
Facility Metering Policy
&
Compliance Document



October 31, 2006

Office of the Secretary
Office for Facilities Management & Policy
Division of Real Property
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HHS FACILITY METERING POLICY

I. Introduction

The Energy Policy Act of 2005 (EPAAct2005) increases Federal energy reduction mandates on an annual basis. To help achieve this requirement, EPAAct2005 requires agencies to measure and account for electricity consumption on a building basis through electrical metering technologies. Specifically, EPAAct2005, Section 103, requires all Federal agencies to install metering and advanced metering in buildings, where found to be cost-effective, by 2012.

Deviation from the HHS Facility Metering Policy and the Compliance Document by the Operating Divisions (OPDIVs) must be reported to and approved by the HHS Energy Officer.

II. HHS Policy

It is HHS policy that OPDIVs must implement electric metering by 2012 in all facilities where life-cycle cost effective. In addition, life-cycle cost effectiveness will be based on a ten-year simple payback assuming at least a two percent annual savings. The OPDIV metering plan must inventory buildings based upon whether standard or advanced meters will be installed. The total square footage of space to be targeted for standard meters must be determined, in addition to the space targeted for advanced meters. OPDIVs will be required to report on the progress of installation against these total square footage values. Section III, Development of OPDIV Metering Plans, in the HHS Metering Compliance Document, will discuss this further.

Once determined whether standard or advanced meters will be used, OPDIVs should install those meters according to the following schedule:

- FY 2007 10 percent of cumulative square footage to have standard meters and 5 percent for advanced meters.
- FY 2008 20 percent of cumulative square footage to have standard meters and 15 percent for advanced meters.
- FY 2009 40 percent of cumulative square footage to have standard meters and 25 percent for advanced meters.
- FY 2010 60 percent of cumulative square footage to have standard meters and 60 percent for advanced meters.
- FY 2011 85 percent of cumulative square footage to have standard meters and 85 percent for advanced meters.
- FY 2012 100 percent of cumulative square footage to have standard meters and 100 percent for advanced meters.

It should be noted that although the installation percentages above are specific to electric meters, meters for all types of energy use should be included in the OPDIVs planning process, especially for new construction and major renovation design guidelines. OPDIVs should determine appropriate OPDIV-specific goals for meters other than electrical. In addition, OPDIVs are directed to meet the goals and objectives as stated throughout this document and the accompanying HHS Metering Compliance Document.

HHS METERING COMPLIANCE DOCUMENT

I. Planning Procedure Summary

In order to meet the metering percentages as outlined in the HHS Facility Energy Metering Policy, OPDIVs must develop a metering plan as detailed in Section III of this document. The OPDIV metering plan will include the results of a metering infrastructure survey, a life-cycle cost analysis of metering compliance at each OPDIV facility, an inventory of meter types to be installed in each facility, and a time line of metering installations. The time line will highlight the priority of installations (buildings with the largest square footage should be metered first). The OPDIV metering report should also outline the financing strategy for the installation of meters.

The OPDIVs must also consider equipment specifications and monitoring the metering systems communication requirements when developing their plans. Annual reporting on the OPDIV metering status is required as outlined in Section VI, Performance Measurements.

II. Metering Objectives

- Fully implement advanced and standard electric metering at all HHS facilities wherever life-cycle cost effective by 2012, based on a ten-year simple payback assuming at least a two percent annual savings.
- Ensure continuous and timely analysis of metered data at all OPDIV sites.
- Reduce electrical consumption by eight percent by end of FY 2011 through no-cost and low-cost efficiency measures identified through continuous and timely data analysis and resulting actions.
- Employ cost allocation and demand response or time allocation programs where possible.
- Include all types of energy metering (natural gas, steam, chilled water, etc.) in OPDIV metering plans.

III. Development of OPDIV Metering Plans

In order to implement the metering goals outlined, OPDIVs shall follow the HHS metering program structure detailed below to develop an OPDIV metering plan. In addition, it is highly recommended that OPDIVs thoroughly review the Department of Energy (DOE), Federal Energy Management Program's (FEMP) *Guidance for Electrical Metering in Federal Buildings* for further details and assistance. The document may be found on the Internet at www1.eere.energy.gov/femp/pdfs/adv_metering.pdf

A) Survey Existing OPDIV Metering Infrastructure

OPDIVs will need to survey existing meters, metering systems, and metering capabilities [e.g., energy management and control system (EMCS) capabilities] in all buildings to the maximum extent practicable. Current uses and status of these metering systems must be identified. In addition, current funding allocations for metering should be outlined.

OPDIVs must also assess the requirements for, and availability of, staff to support on-going metering programs in all phases (i.e., operations, maintenance, and data

analysis). Various options for providing support requirements shall be explored (i.e., subscription services, OPDIV centralized metering programs, dedicated on-site staff, etc.). OPDIVs must determine the amount of funding required to support these functions and shall include this in the OPDIV annual budgeting process.

While EPAAct2005 is interpreted to apply to electric metering only, this policy directs OPDIVs to include the selective application of other energy/utility meters such as steam, water, and natural gas. Addressing these metering opportunities at this time will allow economies of scale to reduce the overall cost and improve overall cost effectiveness of their application.

B) Analyze OPDIV Buildings for Cost-Effectiveness of Metering

OPDIVs shall use the results of the metering infrastructure survey and analyze the cost-effectiveness of metering buildings and the level of resource allocation necessary to monitor the data, in order to determine which buildings should have standard or advanced meters installed.

To determine cost-effectiveness, OPDIVs need to estimate the cost to design, purchase, install, maintain, store data, operate the meter/metering system, and analyze the data output; and the resulting energy cost savings. The FEMP electrical metering guidance contains more detail on this type of analysis.

Metering system costs vary widely for a number of reasons: equipment specifications and capabilities, existing infrastructure, site-specific design considerations, local cost factors, etc. Therefore, it is not possible for this policy to outline a specific dollar value to use as an estimate. OPDIVs are responsible for obtaining industry estimates for their application and locality.

A critical detail to address early in the metering specification phase is the method of data analysis and thus, the extent of data required to complete the analysis. Data, by itself, isn't of much use without some analysis to determine what it means. This is a central and critical point in developing any successful metering program. There are many tried and true methods of trend analysis, for example, and many commercially available software tools that help to make sense out of enormous amounts of data. Often the analysis methodologies chosen and extent of the data requirements dictate what types of metering/monitoring equipment and hardware/software tools are necessary.

To determine the cost savings of the metering in the building, OPDIVs shall use the following table as a guidance in lieu of experience or actual findings.

Metering Savings Ranges

Action	Observed Savings
Installation of meters	0 to 2% (the “Hawthorne effect”)
Bill allocation only	2-1/2 to 5% (improved awareness)
Building tune-up	5 to 15% (improved awareness, and identification of simple O&M improvements)
Continuous Commissioning	15 to 45% (improved awareness, identify simple O&M improvements, project accomplishment, and continuing management attention)

Of course, it is necessary to estimate the annual energy costs in the building to apply the above cost savings ranges. For those buildings where an estimate cannot be made based upon historical consumption data, DOE has developed a database of typical energy usage intensity factors (EUI) (typically given in units of energy use/ft²/year). One source of commercial building EUI data is DOE’s Buildings Energy Databook available online at <http://buildingsdatabook.eren.doe.gov/>. This approach does have its limitations as a building’s energy use is driven by many site-specific variables and characteristics that may approach, but not exactly match, generalized EUI estimates.

A life-cycle cost (LCC) comparison of various metering options is recommended to determine the best possible metering decision. The FEMP metering guidance contains a good example of an LCC analysis on page 11 of the document. For some buildings, advanced meters may not be life-cycle cost effective, but standard meters will be.

EPACT 2005 clearly states that meters shall be installed at Federal facilities “to the maximum extent practicable.” OPDIVs must weigh all of the factors involved with metering beyond the initial cost to purchase and install the meters. This includes the maintenance of the meters and specifically the ability to continuously monitor and analyze the resulting data. Therefore, the associated costs to provide such analysis must be included in the LCC analysis. A meter is completely ineffective and will not save energy if personnel are not reviewing the resulting data and projects (either no-cost, low-cost, or other) are not being implemented.

C) Complete OPDIV Metering Plan

OPDIVs shall complete a formal metering plan based upon the results of the metering infrastructure survey, the LCC analysis, and the technical research outlined in Section VI of this policy document. Additional guidance on developing the metering plan may be obtained from the FEMP electrical metering guidance document.

Since many OPDIVs consist of campuses and sites that manage their own facilities and operate under different circumstances, an OPDIV may have these campus or sub-OPDIV level organizations develop metering plans that best address their individual needs and modes of operation. If campus specific plans are developed they must be incorporated in the OPDIV metering plan. Otherwise, the campus shall be included in the overall OPDIV metering plan.

The OPDIV metering plan must inventory buildings based upon whether standard or advanced meters will be installed. The total square footage of space to be targeted for standard meters must be determined, in addition to the space targeted for advanced meters. OPDIVs will be required to report on the progress of installation against these total square footage values.

The OPDIV metering plan must include, as an appendix, a list of facilities that will not have additional electrical metering installed, due to the LCC analysis. Each building listed shall include the site name, location, building square footage, function, and a brief description of why it was not cost effective to install meters. Acceptable descriptions include, but are not limited to “cost analysis unfavorable,” “building too small,” or “consumption too little.” This requirement is referencing campuses with buildings that will not be targeted for additional metering. These are the buildings that should be included in the inventory list. Individual buildings, however small, are assumed to have existing standard meters and would not be included on this list.

The OPDIV metering plan shall address how campuses and/or sites will finance the design, procurement, and installation of metering system hardware and software. While it will be helpful to have an estimated resource requirement up-front, OPDIVs will likely have to base the financing plan on a general estimate, evaluate the various funding options available, and develop a financing portfolio.

The OPDIV metering plan shall also include a metering implementation time line for each building or campus. The time line should be based on the percent goals of the OPDIV building square footage inventory to be completed and/or percentage of cumulative electric load to be metered across the OPDIV. Consider incorporating the buildings and/or installations into the time line on a priority or greatest payback basis, which is most often dictated by largest square footage.

IV. Technical Requirements and Considerations

OPDIVs must consider and establish several technical details when developing metering plans. First and foremost, the level of data metering must be established. There are four levels of metering:

- One-time/spot measurements (system/sub-system)
- Run-time measurements (system/sub-system)
- Short-term monitoring (system/sub-system/ whole building)
- Long-term monitoring (system/whole building)

The FEMP metering guidance document discusses these levels in further detail.

The level of metering desired will help to establish the technical requirements of the meters required. However, within various meter types there are numerous features to

choose from. OPDIVs are strongly recommended to obtain as much information on metering as possible prior to establishing detailed specifications. Suggested informational sources include first-hand research of metering vendors, Federal sites, or private sector businesses with existing metering programs, FEMP guidance and research, local utilities, and industry research.

When sufficient research has been completed, OPDIVs must establish formal metering plans and implement the following mechanisms.

A) OPDIV Design Guidance and Equipment Specifications

OPDIVs shall issue design guidance and equipment specifications to their components for metering program planning, equipment and hardware, and software and tools in support of HHS metering objectives. This guidance will assist OPDIV sites with implementing metering programs and reduce the need for site personnel to reinvent these documents. The design guidance and equipment specification will serve as a template for individual sites, and will prevent a conflict between OPDIV-level and site-level objectives.

B) OPDIV Metering System Communications Requirements

OPDIVs shall issue plans for their facility managers and information technology staff regarding how to address the metering system's communications requirements. Direction shall be provided on the types of communication tools to be used in various situations such as, energy management control systems (EMCS), networks, cellular devices, telephone/modem connections, or wireless components.

C) Metering Training

Training of energy and facility personnel on advanced metering is critical to the successful installation and application of metering systems. The HHS Energy Office will provide metering training (to cover establishing site objectives, design, procurement, operations, and data analysis) to OPDIV site level leads. As the metering planning requirement works its way to the site levels, many individuals not previously exposed to standard and/or advanced metering will be required to make informed decisions. Training individuals before critical decisions are made will ensure the systems eventually installed will not only satisfy the legislated requirement, but that the metering systems accomplish their desired objectives.

In addition, OPDIVs are encouraged to establish or arrange their own advanced metering training for site level personnel. Resources that may provide training include local utilities, metering vendors, and FEMP.

V. Methods of Financing

Financing of the metering systems installation will be a one of the most difficult aspects of the EPAAct2005 metering requirement. First and foremost, OPDIVs should begin to request funding in their annual budgets for this metering mandate as soon as possible.

Beyond appropriated funds, a second option for funding, and perhaps the most realistic, is the use of alternative financing mechanisms, such as Energy Savings Performance Contracts (ESPC) and Utility Energy Services Contracts (UESC). OPDIV sites may include metering systems in a bundle of energy efficiency measures to be completed through an ESPC or UESC. Other options are available and have been outlined in the following table from the FEMP *Guidance for Electrical Metering in Federal Buildings*.

Summary of Potential Metering/Submetering Funding Mechanisms Available to Federal Sites and Agencies

Funding Mechanisms	Description	Advantages	Disadvantages
Agency Appropriations	Fund using agency appropriations. Most likely local funding but funding can be designated as dedicated at headquarters level. Metering must compete against other initiatives for funding.	Traditional funding approach – no surprises. Potential use of utility funds may provide some local flexibility.	Funds tend to be very limited.
Retained Energy Savings	Agencies with statutory authority are permitted to retain and reinvest a portion of the savings in additional efficiency initiatives. (Section 102 EAct 2005)	Competition limited to other efficiency measures.	Retained energy savings are not widely applied. Check with your agency on its policy.
Energy Savings Performance Contracting (ESPC)	ESPCs may offer several approaches that support or promote the installation of advanced metering systems: – Install as part of measurement and verification effort – Install meters as an energy conservation measure – Purchase meters using a portion of the realized project savings – Install as an energy conservation measure with resulting savings realized stipulated	In cases where ESPCs are in place, new delivery orders can be placed and/or savings streams tapped. Advanced metering systems make possible several new energy conservation of measures such as real time purchasing, peak load management, and on-going retro commissioning. Measurement and verification will be much more rigorous and reliable than other M&V methods.	Meters for M&V may affect cost-effectiveness of measures. Likely reluctance to allow for stipulated savings resulting from installation of meters. More data (case studies) needed. True cost of meters now includes interest payments over the life of the contract.
Utility Energy Services Contracts (UESC)	UESCs have been widely used to install or update new facility mechanical/electrical systems.	UESC approach used widely across the federal sector. Investment paid back through utility bills.	Subject to availability on individual utility basis. Site should work to ensure that savings will result so that utility bill does not increase over budgeted amount. True cost of meters now includes interest payments over the life of the contract.

Funding Mechanisms	Description	Advantages	Disadvantages
Utility Company Financing	<p>Under utility areawide contracts, utilities can offer federal sites a range of services offered to other customers. While service offerings will vary by utility, examples of potential services include:</p> <ul style="list-style-type: none"> – Assistance in designing a metering plan – Utility covers up-front cost to purchase and install with repayment included as a fixed facility charge on bill for a set number of years – Subscription services where customer pays a fee for information but does not own, operate, or maintain metering equipment. 	Utility services are frequently offered by utilities to all customers in their service territory. Federal sites should tap into this pool of services when advantageous.	Services may not be offered by local utility.
Bonneville Power Administration (BPA)	For several years BPA has been working with federal sites to provide low-interest financing in support of energy efficiency measures. Requests for funding are bundled together allowing BPA to shop for the best available interest rates.	Performance guarantees not required in this approach.	Non-traditional funding approach. True cost of meters now includes interest payments over the life of the contract agreement.
Public benefits programs and utility demand response programs	States and/or utility service areas with potential electrical capacity problems may make funding available that allows customers to participate in programs where they can better manage loads.	Funds are “free” when qualifications are satisfied.	Only a limited number of states and utilities currently offer financial incentives to install advanced metering systems. ^a Funding will likely cover only a portion of the purchase cost of the meters—additional funding will still be required.
Require as part of new building and major renovations projects	This approach relies on establishing policy that requires installation of meters/sub-meters as part of major capital projects.	Cost to purchase and install is absorbed as part of the overall construction cost.	Ensuring requirement is not “value engineered out.”
Mandatory tenant submetering fees	Initiate a policy where tenants are billed the costs to purchase, install, and operate a metering/submetering system for their assigned facilities.	The approach assigns the cost to the party that can most benefit in terms of accurate billing and more efficient systems operations.	Tenants will protest additional cost, especially if they don’t see benefit.

Funding Mechanisms	Description	Advantages	Disadvantages
O&M Performance Incentives	Federal Acquisition Regulations (FAR), Subpart 16-404 Fixed Price with Award Fees, allows for contractors to receive a portion of savings realized from actions initiated on their part that are seen as additional to original contract. O&M performance incentives attempt to capitalize on this provision by awarding fees for contractors completing low-cost and no-cost measures not specifically called out in the contract. Contractor fee would be a part of the energy savings realized. Contractor can install advanced meters and use data to optimize buildings to achieve award eligible savings. ^b	Can be a no-cost approach to install meters as contractor may agree to pick-up purchase, installation, and operations costs.	There are no known examples of O&M performance incentives in federal buildings. Agreeing to terms with the O&M contractor may require significant negotiation. Performance incentives awards requires on-going oversight.
Lease Metering Equipment	Lease advanced meters from GSA Federal Supply Service similar to leasing of other equipment.	Can pay out of utility account so savings can cover lease payments. Less up-front funding needed.	Periodic leasing fees vs. one-time expense when purchasing.
<p>a. Information on state energy efficiency funds and demand response programs is available on the FEMP utility Web site: http://www.eere.energy.gov/femp/program/utility/utilityman_energymanage.cfm. Check with your state energy office and servicing utilities to verify and/or obtain information on current program offerings.</p> <p>b. See Section 3.8.1, Contract Language, of the FEMP O&M Best Practices Guide for more information on O&M performance incentives.</p>			

VI.

In order to ensure progress toward the goals of the HHS Metering Policy and EPCAct2005, OPDIVs are required to report on metering installation per the following outline.

A) OPDIV Annual Energy Report

Starting in FY 2007 and continuing through FY 2012, OPDIVs must complete the table below and include in the OPDIV Annual Energy Report. OPDIVs shall report the number of buildings metered, the cumulative square footage, and the percentage of OPDIV electricity consumption represented by those buildings, and distinguish between standard meters and advanced meters for each year. The FY 2007 report should include the total number of buildings already being metered. All reporting should be on a cumulative basis.

FY	Standard Meters (where cost effective and/or practicable)		Advanced Meters (where cost effective and/or practicable)	
	Cumulative Square Footage of Buildings Metered	Cumulative % of Electric Metered	Cumulative Square Footage of Buildings Metered	Cumulative % of Electric Metered
2007		10		5
2008		20		15
2009		40		25
2010		60		60
2011		85		85
2012		100		100

OPDIVs must determine which buildings will have standard meters installed and which will employ advanced metering and develop an inventory baseline. These baselines will provide the basis to determine the percentages in the above table.

B) OMB Energy Scorecard

The OMB Energy Scorecard includes electrical metering as a scored item. Updates to the scorecard are required bi-annually and therefore, the OPDIV may be required to provide an update during June of each year.

C) Review of OPDIV Metering Plans

OPDIVs shall review metering plans annually to reflect changing electric rates, screening assumptions, lessons learned, design, financing, or procurement changes with the OPDIV or at a specific site. Sites that were at one time identified as non-practicable for metering installation, may some year be deemed life-cycle cost effective applications of metering technology. OPDIV metering plans shall be reviewed and updated by the beginning of August each year.