

Contact Person	Michael Vaclav	Revision	5
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Site Metering Plan

This plan formalizes the Ames Laboratory Site Metering Plan and defines the responsibilities for implementation.

1.0 APPROVAL RECORD

- Reviewed by: Amy J. Tehan, Document Control Coordinator
- Approved by: Mark E. Grootveld, Manager, Facilities Services
- Approved by: Mark L. Murphy, Chief Operations Officer
- Approved by: Dr. Alexander H. King, Laboratory Director

The official approval record for this document is maintained in the Training & Records Management Office, 151 TASF.

2.0 REVISION/REVIEW INFORMATION

The revision description for this document is available from and maintained by the author.

3.0 PURPOSE AND SCOPE

The Energy Policy Act of 2005 (EPAAct05) requires "By October 1, 2012, in accordance with guidelines established by the Secretary under paragraph (2), all Federal buildings shall, for the purposes of efficient use of energy and reduction in the cost of electricity used in such buildings, be metered. Each agency shall use, to the maximum extent practicable, advanced meters or advanced metering devices that provide data at least daily and that measure at least hourly consumption of electricity in the Federal buildings of the agency." Further, DOE has directed DOE-owned and contractor-operated sites to develop a Site Metering Plan outlining how this, and future, metering goal will be accomplished. This document is the Site Metering Plan for Ames Laboratory (AL) covering the period FY 2013 and FY 2014.

4.0 ROLES AND RESPONSIBILITIES

4.1 Manager, Facilities Services

Responsible for oversight of the Ames Laboratory Comprehensive Energy Management Program (CEMP).

4.2 Plant Engineer

Responsible for collection and reporting of data and monitoring progress toward defined goals.

5.0 PROGRAM/POLICY/PROCEDURE INFORMATION

The Ames Laboratory is a Government-owned, Contractor-operated facility located in Ames, Iowa on the campus of Iowa State University (ISU), its contractor. Ames Laboratory is an Office of Science Program-Dedicated Laboratory whose mission is to conduct fundamental research in the physical, chemical, materials, mathematical sciences and engineering which underlie energy generating, conversion, transmission and storage technologies, environmental improvement and other technical areas essential to national needs.

The Laboratory has a real property inventory of 12 buildings totaling 327,664 gross square feet. The inventory includes one office building, three research buildings and eight smaller support buildings. Electrical power is purchased from the local municipal utility, steam and chilled water

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are purchased from the University and natural gas is purchased from the local utility. In the support of its research in FY2011, Ames Laboratory used 71.9 billion Site-Delivered Btus of energy at a cost of just under \$1.4 million.

The purpose of this plan is to address four major areas as follows:

- Meet Congressional and DOE mandated metering goals.
- Install and maintain cost effective metering.
- Collect, analyze and store utility use data.
- Improve energy efficiency.

This plan is a dynamic document in that it will be reviewed and updated on an annual basis to ensure that metering requirements are being met and that there are specific plans for the next two years. The level of detail and specific goals identified in this plan are commensurate with the size of the facility and the level of energy consumption as compared to other DOE sites.

The Laboratory is committed to the concept of the installation of cost-effective metering. The DOE guidance will be used as the basis for determining where meter installation is cost effective. Actual data and manufacturer's quotes will be used in the determination wherever possible. While DOE recommends the use of Energy Savings Performance Contracts to provide third-party funding, Ames has not identified any possibilities for using this for the installation of meters. Therefore meter installations will require the use of GPP or operating funds. These expenditures are scrutinized very closely to make sure that the Laboratory is a good steward of DOE resources. Because of this, the schedule for installation of meters may be accelerated or delayed, over the short term, based on the availability of funds and the priorities of needs.

3.1. Policy Statement

It is the policy of the Ames Laboratory to conserve energy with the goal of reducing energy use and costs to the lowest cost-effective levels while meeting the mission of the Ames Laboratory.

3.2. Energy Management at Ames Laboratory

3.2.1. Organization

Ames Laboratory does not have a dedicated Energy Management Group, instead, all sustainability efforts receive matrix support from Environment, Safety, Health and Assurance, Facilities Services Group, and Purchasing in conjunction with the Environmental Management System (EMS) oversight committee. The Facilities Services Group is responsible for the development, implementation and coordination of the Site Metering Plan.

3.2.2. Goals

- DOE Mandated Goals
 - Establish a Site Metering Plan that identifies meters to be installed according to the guidelines of the DOE Metering Plan. This plan fulfills the requirements of this goal.
 - By October 1, 2012, install electrical meters in all buildings using advanced metering where feasible and cost effective. This goal has been met. All appropriate buildings were fitted with advanced electric metering as of April 30, 2010.

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- EISA 2007 Mandated Goals
 - By October 1, 2016, provide for equivalent metering of natural gas and steam. Currently all appropriate buildings at the Ames Laboratory are metered for natural gas and steam utilizing standard metering. The chilled water is metered for the site as a whole, individual buildings are not sub-metered for this utility.
 - “The energy manager shall enter energy use data for each metered building that is (or is a part of) a facility that meets the criteria established by the Secretary under paragraph (2)(B) into a building energy use benchmarking system, such as the Energy Star Portfolio Manager.” To meet this requirement The Ames Laboratory has developed a plan to sub-meter buildings to provide the required energy use data.

All of the goals identified in this document are intended to help reach one overall objective - to reduce energy use and costs to the lowest cost-effective levels while meeting the mission of the Ames Laboratory.

3.2.3. High Performance Sustainable Building Guiding Principles

Executive Order 13514 requires: "ensuring that at least 15 percent of the agency's existing buildings (above 5,000 gross square feet) and building leases (above 5,000 gross square feet) meet the *Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings*, (Guiding Principles) by fiscal year 2015 and that the agency makes annual progress toward 100-percent conformance with the Guiding Principles for its building inventory."

The Ames Laboratory requires the installation of additional meters to document meeting the energy consumption requirements of the Guiding Principles.

3.3. Plan

- Using guidance provided by DOE/EE-0312 – Guidance for Electric Metering in Federal Buildings and FEMP Document # 2006.100, Rev. 0 – DOE Buildings Electric Metering Guidance, September 27, 2006, it was determined that the following Ames Laboratory Buildings require advanced electrical metering:
 - Spedding Hall
 - Wilhelm Hall
 - Metals Development
 - Technical and Administrative Support Facility (TASF)
- All buildings, identified above, have been properly metered for electricity usage.
- Develop cost estimates and identify funding to install sub-metering within the Ames Laboratory campus to allow documentation of energy utilization improvements and collection of data to allow bench marking of individual buildings.
- Collect and use metering data to achieve electrical energy savings.

3.4. Plan Strategy

The installation of advanced electrical metering at the Ames Laboratory was a single

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project that installed the required meters in all of the buildings. Meter technologies, products and vendors have been evaluated and standardized on the Johnson Controls Metasys platform. Meter installation was completed in April, 2010. Any building level sub-metering of chilled water and/or upgrading of water or steam metering to smart meters will be approached in the same manner.

Currently, the supplier of utilities to the Ames Laboratory has a single smart meter which monitors chilled water use for the entire site, building sub-metering is not installed. Ames Laboratory is in the process of negotiating access to that meter and the real-time and trend data it produces.

Natural gas used at the Ames Laboratory accounts for approximately 2.25% of annual energy consumption. Using guidance described in DOE/EE-0312 – Guidance for Electric Metering in Federal Buildings and FEMP Document # 2006.100, Rev. 0 – DOE Buildings Electric Metering Guidance, September 27, 2006, the installation of smart meters to monitor the use of natural gas at the Ames Laboratory is not cost effective and, therefore, not required.

3.5. Tracking Progress

Pending requirements for advanced metering of utilities other than electricity will necessitate that this procedure be reviewed at least annually to ensure that Ames Laboratory is prepared to meet the new metering requirements should they be issued.

3.6. FY 2013 Activities

During FY 2013 the Ames Laboratory plans to:

- Continue to trend and analyzing meter data to maximize energy and monetary savings.
- Review and update the Metering Plan.
- Prepare project scope definitions, outline specifications and cost estimates for the installation of a chilled water sub-meters for TASF, Metals Development, Spedding Hall and Wilhelm Hall.
- Prepare project estimates for the installation of a condensate sub-meter for TASF.

3.7. FY 2014 Activities

During FY 2014 the Ames Laboratory plans to:

- Complete any outstanding sub-metering as funding allows.
- Continue to trend and analyzing meter data to maximize energy and monetary savings.
- Review and update the Metering Plan.