

**AMERICAN NATIONAL STANDARD**  
**ANSI/MSE 50021-2016**

***Superior Energy Performance<sup>®</sup> —  
Additional Requirements for Energy  
Management Systems***

Secretariat:  
Georgia Tech Energy and Sustainability Services (GTESS)

Approved as an American National Standard on August 25, 2016



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## **Foreword**

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ANSI approval of a standard verifies that the principles of openness and due process have been followed in the approval procedure and that a consensus of those directly and materially affected by the standards has been achieved. A Draft National Standard was circulated to the Georgia Tech Energy and Sustainability Services (GTESS) Consensus Board, consisting of a balanced group of materially affected interests and to those responding to the public announcements in ANSI Standards Action. Approval of this Standard as an American National Standard requires acceptance by a minimum of 80 percent of the Consensus Board members casting a vote.

ANSI/MSE 50021-2016 *Superior Energy Performance*<sup>®</sup> — *Additional Requirements for Energy Management Systems* was developed by GTESS. This Standard contains one normative annex (Annex A) which is considered a required part of the Standard.

Submit formal requests for interpretations of ANSI/MSE 50021-2016 requirements to GTESS Standards Coordinators, Holly Grell-Lawe or Deann Desai, Georgia Tech Energy and Sustainability Services (GTESS), 75 Fifth Street, N. W., Suite 300, Atlanta, GA 30332-0640; E-Mail: [energy@innnovate.gatech.edu](mailto:energy@innnovate.gatech.edu); Telephone: 770-605-4474; Web: [www.energymanagementstandards.org](http://www.energymanagementstandards.org). The GTESS Interpretations Committee will review and determine disposition of each request.

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## Introduction

Third party conformity assessment to Superior Energy Performance<sup>®</sup> (SEP<sup>™</sup>) is a scheme from the U.S. Department of Energy that is accredited through Accreditation Bodies. The SEP program allows organizations to demonstrate the continual improvement achieved in energy performance during the achievement period. SEP provides a transparent, globally accepted system for verifying energy performance improvements and management practices. A central element of SEP is implementation of ISO 50001 *Energy management systems—Requirements with guidance for use*, with additional requirements for energy management and for achieving and documenting energy performance improvements.

The purpose of this American National Standard, ANSI/MSE 50021-2016, is to specify the additional SEP energy management requirements beyond the ISO 50001 requirements that are necessary for SEP certification. Annex A of this Standard is a normative annex (i.e. contains requirements) that provides SEP requirements related to the scope of the system. SEP performance related requirements are set out in the normative documents listed in Section 2 of this Standard.

The SEP program requirements will vary based on the applicant's desired level of energy performance achievement (Bronze, Silver, Gold or Platinum). Conformance with MSE 50021-2016 is required for SEP certification across all levels of SEP energy performance achievement.

Superior Energy Performance is applicable to organizations of all sizes and levels of experience in managing energy. Conforming to the SEP requirements helps organizations achieve their sustainability goals, providing organizations with tools to manage their energy consumption, related costs, and programs such as carbon footprint.

**All of the titles, including section titles, in this Standard have been taken directly from ISO 50001:2011 © ISO – All rights reserved, with the permission of the American National Standards Institute on behalf of the International Organization for Standardization (ISO).**



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# Superior Energy Performance<sup>®</sup> – Additional Requirements for Energy Management Systems

## 1. Scope

This American National Standard specifies requirements for an organization to establish, implement, maintain and improve energy performance through Superior Energy Performance<sup>®</sup> (hereinafter, "SEP") and an energy management system (hereinafter, "EnMS").

This American National Standard is used in conjunction with ISO 50001:2011 *Energy management systems – Requirements with guidance for use*, and it can be aligned or integrated with other management systems.

This American National Standard is applicable to any organization that wishes to ensure its conformity to the requirements of SEP and desires to demonstrate such conformance to others. This can be confirmed by certification to SEP by a SEP-accredited organization called a verification body and certification to ISO 50001 requirements by an accredited ISO 50001 certification body or a SEP-accredited verification body.

## 2. Normative references

Superior Energy Performance<sup>®</sup> Measurement and Verification Protocol  
Superior Energy Performance<sup>®</sup> Scorecard  
Superior Energy Performance<sup>®</sup> Certification Protocol  
ISO 50001:2011 Energy management systems-Requirements with guidance for use

## 3. Terms and definitions

### 3.1

#### **achievement period**

interval between the end of the **baseline period** (3.2) and the end of the **reporting period** (3.24)

Note 1 to entry: The achievement period shall not be more than 10 years.

### 3.2

#### **baseline period**

specific period of time selected as the reference period for the determination of SEP **energy performance improvement** (3.11)

### 3.3

#### **boundaries**

physical or site limits as defined by the **organization** (3.20)

[Source: ISO 50001:2011, 3.1 - modified (removed "and/or organization limits" and examples)]

### 3.4

#### **central office**

location or network of local offices or branches (sites) of a **multi-site organization** (3.17), at which EnMS activities are fully or partially planned, controlled or managed

Note 1 to entry: The central office is not necessarily the headquarters or a single location.

[Source: ISO 50003:2014, 3.2]

### 3.5

#### **delivered energy**

energy arriving at the boundary(ies)

Note 1 to entry: Delivered energy includes primary energy produced (such as oil from a well) or renewable energy used within the facility boundaries to produce derived energy (such as solar, wind, or geothermal energy used to generate electricity onsite) as they arrived from outside the facility boundaries.

[Source: ISO 50047, 3.3 - modified (removed “of an organization”, changes made to Note)]

### 3.6

#### **derived energy**

a type of energy produced from the conversion of another type of energy

EXAMPLE: steam produced from a boiler fueled by natural gas

### 3.7

#### **energy**

electricity, fuels, steam, heat, compressed air, and other like media

Note 1 to entry: For the purposes of the SEP Measurement & Verification Protocol, energy refers to the various types of energy, which can be purchased, stored, treated, used in equipment or in a process, or recovered.

Note 2 to entry: Energy can be defined as the capacity of a system to produce external activity or perform work.

[Source: ISO 50001:2011, 3.5 - modified (replaced “International Standard” with “SEP Measurement & Verification Protocol”, and removed “including renewable” in NOTE 1)]

### 3.8

#### **energy accounting**

system of rules, methods, techniques and conventions used to measure, analyze, and report **energy consumption** (3.9)

[Source: ISO 50047:2016, 3.6]

### 3.9

#### **energy consumption**

quantity of energy applied

[Source: ISO 50001:2011, 3.7]

### 3.10

#### **energy performance**

measurable results related to energy efficiency, **energy use** (3.13), and **energy consumption** (3.9)

[Source: ISO 50001:2011, 3.12 - modified (removed Notes 1 and 2)]

**3.11**

**energy performance improvement**

the energy performance improvement percentage is used with the SEP Certification Protocol and SEP Scorecard to determine SEP certification level. Energy performance improvement (%) =  $(1 - SE_{nPI}) \times 100$

[Source: SEP Measurement & Verification Protocol]

**3.12**

**energy services**

activities and their results related to the provision and/or use of energy

[Source: ISO 50001:2011, 3.16]

**3.13**

**energy use**

manner or kind of application of energy

EXAMPLES: ventilation; lighting; heating; cooling; transportation; processes; production lines

[Source: ISO 50001:2011, 3.18]

**3.14**

**facility**

physical area occupied by an **organization** (3.20) at a particular location

Note 1 to entry: A facility may be a subset of a location.

Note 2 to entry: A facility subset may not be an energy system (e.g. a steam system).

**3.15**

**f-test**

a statistical test that can be used to assess how well a regression model fits the data, or how much evidence there is that a particular variable or set of variables belong in the model

**3.16**

**feedstock**

raw or unprocessed material used as an input to a manufacturing process to be converted to a product

EXAMPLE: crude oil used to produce petroleum products

**3.17**

**multi-site organization**

**enterprise-wide organization**

organization covered by a single management system comprised of an identified **central office** (3.3) at which certain activities are planned, controlled, and a network of sites (permanent, temporary or virtual) at which such activities are fully or partially carried out

Note 1 to entry: Enterprise-wide does not imply that all facilities must be included.

Note 2 to entry: For additional information see Annex A.1.2

**3.18****non-routine adjustment**

adjustment made to the energy baseline to account for unusual changes in **relevant variables** (3.23) or **static factors** (3.25), outside the changes accounted for by normalization

Note 1 to entry: Non-routine adjustments may apply where the energy baseline no longer reflects energy use or energy consumption patterns, or there have been major changes to the process, operational patterns, or energy using systems

Note 2 to entry: For routine adjustments, normalization is used

[Source: ISO 50015:2014, 3.16 - modified (added Note 2)]

**3.19****normalization**

process of routinely modifying energy data in order to account for changes in **relevant variables** (3.23) to compare **energy performance** (3.10) under equivalent conditions

[Source: ISO 50006:2014, Section 3.13 - modified (removed Note 1 to entry)]

**3.20****organization**

company, corporation, firm, enterprise, authority or institution, or part or combination thereof, whether incorporated or not, public or private, that has its own functions and administration and that has the authority to control its energy use and consumption

Note 1 to entry: An organization can be a person or a group of people.

[Source: ISO 50001:2011, 3.22]

**3.21****p-value**

value indicating the probability that a derived value is not correlated to another value.

Note 1 to entry: This statistic is used to determine the significance of a modeled result.

Note 2 to entry: A low p-value represents a high correlation between two variables.

[Source: Better Plants Energy Intensity Baseline and Tracking Guidance February 2015-modified (created the two notes from the sourced definition text)]

**3.22****primary energy**

energy that has not been derived from another type of energy.

**3.23****relevant variable**

quantifiable factor that affects **energy performance** (3.10) and routinely changes

EXAMPLES: Production parameters (production volume, production rate); weather conditions (outdoor temperature, degree days); operating hours; operating parameters (operational temperature, light level).

[Source: ISO 50047:2016, 3.18]

### 3.24

#### **reporting period**

ending period in which **energy performance improvement** (3.11) is measured relative to the **baseline period** (3.2) to determine SEP energy performance improvement

### 3.25

#### **static factor**

identified factor that affects **energy performance** (3.10) and does not routinely change

[Source: ISO 50047:2016, 3.20]

### 3.26

#### **Superior Energy Performance energy performance indicator**

#### **SEnPI**

facility level ratio of **reporting period** (3.24) energy consumption to **baseline period** (3.2) **energy consumption** (3.9), where one or both of these values shall be adjusted to correspond to consistent conditions

Note 1 to entry: The SEnPI shall be calculated using the SEP Measurement and Verification Protocol (hereinafter referenced as "SEP M&V Protocol").

## 4 Energy management system requirements

### 4.1 General requirements

An SEP scope and boundaries statement shall be established and documented for each facility. The SEP scope must meet the requirements in [normative Annex A](#).

NOTE: For a multi-site organization, each facility needs a scope and boundaries statement for SEP. This is unlike the ISO 50001 scope and boundaries statement, which may address more than one facility.

The scope and boundaries of the EnMS and the SEP facility shall not exclude energy sources. In a multi-site EnMS, energy sources at each facility may differ, but each facility shall not exclude an energy source.

ISO 50001(EnMS) certification shall be attained prior to or concurrent with SEP certification.

### 4.2 Management responsibility

Top management is responsible for ensuring the SEnPI is appropriate to the SEP scope and boundaries.

### 4.3 Energy policy

There are no additional requirements at this time.

### 4.4 Energy planning

#### 4.4.1 General

The energy planning process shall address the means to achieve the intended SEP performance level.

#### 4.4.2 Legal requirements and other requirements

SEP shall be considered an “other requirement.”

#### 4.4.3 Energy review

The energy consumption data and data period shall meet the requirements of the *SEP M&V Protocol*, including considerations of other relevant variables, such as weather, activity level, and other variables that affect energy performance (see the *SEP M&V Protocol*). The data shall be collected from the beginning of the baseline period through the achievement period.

In identifying the equipment, systems, and processes that significantly affect energy use and energy consumption, the SEP facility shall develop a list of equipment, systems, processes that together account for 80% of that facility’s annual energy consumption.

#### 4.4.4 Energy baseline

The SEP baseline(s) shall be provided in accordance with the *SEP M&V Protocol*.

#### 4.4.5 Energy performance indicators

The facility shall include the SEnPI in the EnMS.

#### 4.4.6 Energy objectives, energy targets and energy management action plans

The anticipated energy savings for each action plan shall be estimated and the actual energy savings achieved shall be determined.

Information on the energy performance improvements related to the energy performance improvement claim shall be established and maintained for each certification period (initial and recertification).

### 4.5 Implementation and operation

#### 4.5.1 General

The action plans and other actions necessary to achieve the intended SEP performance level shall be implemented.

#### 4.5.2 Competence, training, and awareness

Training needs related to the significant energy uses and the actions implemented to address those needs shall be recorded.

The training needs for the energy team and the actions implemented to address those needs shall be recorded.

#### 4.5.3 Communication

A method for communicating with the SEP Administrator shall be established and maintained as part of the external communication process.

#### 4.5.4 Documentation

There are no additional requirements at this time.

#### 4.5.5 Operational control

There are no additional requirements at this time.

#### **4.5.6 Design**

There are no additional requirements at this time.

#### **4.5.7 Procurement of energy services, products, equipment and energy**

There are no additional requirements at this time.

### **4.6 Checking**

#### **4.6.1 Monitoring, measurement and analysis**

Key characteristics shall include the SEnPI. The data from the end of the achievement period shall be no more than eleven (11) months old at the time of the Stage 2 certification audit or recertification audit.

For recertification, the achievement period shall be 36 months.

NOTE: See the *SEP Certification Protocol* for additional information on approvals for changes in baseline.

#### **4.6.2 Evaluation of compliance with legal requirements and other requirements**

There are no additional requirements at this time.

#### **4.6.3 Internal audit of the EnMS**

At least once in every certification cycle, and prior to initial certification, the organization shall conduct an internal audit:

- a) using the *SEP M&V Protocol* to determine the energy performance claim to be included in the *SEP Application* for certification or recertification;
- b) that includes, for Gold and Platinum facilities, auditing of the credits claimed in the *SEP Scorecard*.

#### **4.6.4 Nonconformities, correction, corrective action and preventive action**

A documented procedure for corrective action shall be implemented and maintained.

#### **4.6.5 Control of records**

A documented procedure for the control of records shall be implemented and maintained.

NOTE: The records include those to support the *SEP Scorecard* credits for the Gold or Platinum performance level.

### **4.7 Management review**

#### **4.7.1 General**

The review of continuing suitability of the EnMS shall include a review of the SEnPI, SEP performance level and *SEP Scorecard* credits (as applicable) prior to the initial Stage 2 audit, and at least once before each recertification.

#### **4.7.2 Input to management review**

The input to management review shall include:

- a) a review of the energy performance as it relates to the SEnPI for each period (initial certification or recertification); and
- b) a review of the *SEP Scorecard* credits for each period (initial certification or recertification), as applicable.

**4.7.3 Output from management review**

The outputs of management review shall include any changes in the decisions related to

- a) the SEP performance level, and
- b) the *SEP Scorecard* credits being claimed, as applicable.

## **Annex A** (normative)

### **Scope Requirements**

#### **A.1 Clarification of Scope**

##### **A.1.1 Facility**

If the participating facility is a single location, the scope and boundaries are defined based on the measured energy consumption from a calibrated meter, for each energy source.

If the participating facility is a subset of a location, measured energy consumption from a calibrated meter, for each energy source must be available for the energy consumed within the defined facility boundaries.

Areas of the organization can be excluded:

- i. if the energy data are available in detail for the non-exclusion and exclusion areas, and
- ii. the source of the data is from calibrated or revenue meters or billing information, (see the *SEP M&V Protocol*) and
- iii. the remaining area meets the facility definition.

##### **A.1.2 Multi-site EnMS**

SEP facilities may use a multi-site EnMS certification to meet the SEP requirement for ISO 50001 certification.

If the central office is a facility or a sub-set of a facility, then it is eligible for SEP certification. If the central office is not a facility, it is not eligible for SEP certification, but may perform the role of the central office for the EnMS.

For an organization with multi-site EnMS, there is a central office which controls and manages processes in accordance with normative Annex B of ISO 50003:2014