



***Society of Cable
Telecommunications
Engineers***

**ENGINEERING COMMITTEE
Energy Management Subcommittee**

SCTE STANDARD

SCTE 234 2016

**ISO 50001:2011 Energy Management Systems, Energy
Metrics, With Guidance For Use**

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1. Introduction

1.1. Executive Summary

SCTE's Energy 2020 Program is a multi-year campaign that aims to provide cable system operators with the energy management standards, technology innovation, organizational solutions and training that look to help the cable industry meet Energy 2020's goals. In 2011 the International Organization for Standardization (ISO) published 50001: Energy management systems -- Requirements with guidance for use. SCTE's Energy 2020 Program aligns with the underlying principles of that publication and SCTE 234 2016 serves as the recognition of that international standard as the official cable industry standard.

1.2. Scope

ISO 50001:2011 specifies requirements for establishing, implementing, maintaining and improving an energy management system, whose purpose is to enable an organization to follow a systematic approach in achieving continual improvement of energy performance, including energy efficiency, energy use and consumption.

ISO 50001:2011 specifies requirements applicable to energy use and consumption, including measurement, documentation and reporting, design and procurement practices for equipment, systems, processes and personnel that contribute to energy performance.

ISO 50001:2011 applies to all variables affecting energy performance that can be monitored and influenced. ISO 50001:2011 does not prescribe specific performance criteria with respect to energy, however the cable industry has come together to publish its performance criteria in the SCTE Standards supporting Energy 2020 found at http://www.scte.org/SCTE/Areas_of_Interest/SCTE_Energy_Standards_and_Operational_Practices.aspx

ISO 50001:2011 is applicable to any company in the cable industry wishing to develop an energy policy and ensure that business practice conforms to its stated energy policy and wishing to demonstrate this to others, such conformity being confirmed either by means of self-evaluation and self-declaration of conformity, or by certification of the energy management system by an external organization.

1.3. Benefits

Energy 2020 and the recognition of ISO 50001 enables companies in the cable industry to hedge growing energy costs and power availability challenges, and sustain those benefits over the long term. Adoption of ISO 50001 specifically will enable the following short and long term benefits:

- Reduced environmental impact
- Increased transparency on how energy resources are managed
- Identification of future projects that will integrate into your new structure
- Promotion of energy efficiency throughout the cable operator's organization
- Improved positive external relations and public image
- Increased awareness and greater employee energy stewardship
- Reduced air emissions, such as greenhouse gases
- Increased assurance of internal energy use compliance
- Increased understanding of energy use and consumption via defined methods, metrics, goals and processes of data collection
- Reduced maintenance costs from better managed IT and cooling equipment
- Increased capacity in facilities by improved power utilization

Through Energy 2020 that aligns to the ISO 50001 model, the cable industry is positioned to improve its energy efficiency and achieve significant cost avoidance.

1.4. Intended Audience

Individuals within the cable industry senior teams such as sustainability officers, energy managers, chief network/technology officers, or employees having the authority to set wide spread company direction should leverage SCTE 234 2016.

1.5. Areas for Further Investigation or to be Added in Future Versions

Within the ISO 50001 series, there are two other supporting documents that are under consideration for further investigation:

- ISO 50002:2014 Energy audits - Requirements with guidance for use
- ISO 50003:2014 Energy management systems - Requirements for bodies providing audit and certification of energy management systems

2. Normative References

The following documents contain provisions, which, through reference in this text, constitute provisions of this document. At the time of Subcommittee approval, the editions indicated were valid. All documents are subject to revision; and while parties to any agreement based on this document are encouraged to investigate the possibility of applying the most recent editions of the documents listed below, they are reminded that newer editions of those documents might not be compatible with the referenced version.

2.1. SCTE References

- ANSI/SCTE 211 2015: Energy Metrics for Cable Operator Access Networks
<http://www.scte.org/documents/pdf/Standards/SCTE%20211%202015.pdf>
- ANSI/SCTE 213 2015: Edge and Core Facilities Energy Metrics
http://scte.org/SCTEDocs/Standards/ANSI_SCTE%20213%202015.pdf

2.2. Standards from Other Organizations

- ISO 50001:2011(en) Energy management systems — Requirements with guidance for use
<https://www.iso.org/obp/ui/#iso:std:iso:50001:ed-1:v1:en>

2.3. Published Materials

- No normative references are applicable.

3. Informative References

The following documents might provide valuable information to the reader but are not required when complying with this document.

3.1. SCTE References

- No informative references are applicable.

3.2. Standards from Other Organizations

- No informative references are applicable.

3.3. Published Materials

- United States Environmental Protection Agency Guidelines for Energy Management
<https://www.energystar.gov/buildings/tools-and-resources/energy-star-guidelines-energy-management>

4. Compliance Notation

<i>Shall</i>	This word or the adjective “ <i>required</i> ” means that the item is an absolute requirement of this document.
<i>shall not</i>	This phrase means that the item is an absolute prohibition of this document.
<i>Forbidden</i>	This word means the value specified shall never be used.
<i>Should</i>	This word or the adjective “ <i>recommended</i> ” means that there may exist valid reasons in particular circumstances to ignore this item, but the full implications should be understood and the case carefully weighted before choosing a different course.
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<i>Deprecated</i>	Use is permissible for legacy purposes only. Deprecated features may be removed from future versions of this document. Implementations should avoid use of deprecated features.

5. Abbreviations and Definitions

5.1. Abbreviations

ANSI	American National Standards Institute
EnMS	Energy Management System
EPA	United States Environmental Protection Agency
ISO	International Organization for Standardization
IT	Information Technology
SCTE	Society of Cable Telecommunications Engineers

5.2. Definitions

None.

6. ISO 50001 Recognition

Companies in the cable industry looking to support the Energy 2020 program and institute energy management at their company *shall* reference the ISO 50001:2011 requirements for establishing, implementing, maintaining and improving an energy management system. The standard can found at http://www.iso.org/iso/catalogue_detail?csnumber=51297.

6.1. Key Performance Energy Metrics

Since ISO 50001:2011 does not prescribe specific performance criteria, the cable industry has published the following documents that *shall* be at a minimum referenced when measuring cable systems energy performance:

- ANSI/SCTE 211 2015: Energy Metrics for Cable Operator Access Networks
<http://www.scte.org/documents/pdf/Standards/SCTE%20211%202015.pdf>
- and
- ANSI/SCTE 213 2015: Edge and Core Facilities Energy Metrics
http://scte.org/SCTEDocs/Standards/ANSI_SCTE%20213%202015.pdf

7. Energy Management Systems Program Assessment Matrix

To help aid, guide, and measure their adoption of ISO 50001, cable industry companies *should* refer to the following matrix and checklist when assessing how much progress has been obtained. How to use the Assessment Matrix:

The matrix outlines the key activities supporting SCTE 234 2016 and three levels of implementation:

- Where there is no evidence
- Where some elements of a system are in place
- Where an energy management system is fully implemented

The matrix is organized along the lines of the trusted approach of Plan, Do, Check, Act, as follows:

- PLAN (Top Management Responsibilities. Appointed Energy Manager, Energy Policy, Energy Planning and Review)
- DO (Implementation and Operation)
- CHECK (Checking)
- ACT (Management Review)”

To apply this assessment matrix, follow these steps:

1. Compare your program to the matrix by identifying the degree of implementation that most closely matches your organization's program status.
2. Use a highlighter to fill in the cell that best characterizes the level of implementation of your program. The result will be a visual comparison of your programs progress.

3. Identify the steps needed to fully implement the energy management elements and record these in the Next Steps column.

7.1. Assessment Matrix

Table 1 – Energy Management Systems Program Assessment Matrix

Energy Management System (EnMS) Requirements	Little or no evidence	Some elements	Fully Impl.	Next Steps
GENERAL				
Define and document the scope and boundaries of Energy Management System (EnMS)				
TOP MANAGEMENT RESPONSIBILITIES				
Top management demonstrates its commitment to support the EnMS and continual improvement by:				
Defining, establishing, implementing and maintaining an energy policy				
Provide human resources, specialized skills, technology and financial resources to establish, implement, maintain and improve the EnMS and resulting energy performance				
Voice the importance of energy management to the population of employees and contractors				
Ensure energy objectives and targets are established				
Ensure that energy performance indicators are appropriate to the organization				
Consider energy performance in long term strategic planning				
Ensure results are measured and reported at determined intervals				
Hold management reviews				
APPOINTED ENERGY MANAGER				
Appointed by the top management, tasked with the responsibility and authority to:				
Ensure the EnMS is established, implemented, maintained and continually improved				
Identify person(s) authorized by an appropriate level of management to work with the management representative in support of energy management activities				
Report to top management on energy performance and EnMS				
Ensure the planning of energy management activities is designed to support the organization's energy policy				

Define and communicate responsibilities and authorities in order to facilitate effective energy management				
Determine criteria and methods needed to ensure that both the operation and control of the EnMS are effective				
Promote awareness of the energy policy and objectives at all levels of the organization				
ENERGY POLICY				
Crafted to state the organization's commitment to achieving the energy performance improvement and defined by top management ensuring the following:				
Is appropriate to the nature and scale of the organization's energy use and consumption				
Includes commitment to continual improvement				
Includes commitment to ensure availability of information and necessary resources to achieve objectives and goals				
Provides a framework for setting and reviewing energy objectives and targets				
Supports the purchase of energy-efficient products and services, and design for energy performance improvement				
Is documented and communicated at all levels within the organization				
Is regularly reviewed and updated as necessary				
ENERGY PLANNING AND REVIEW				
Conduct and document an energy planning process consistent with the energy policy leading to activities that continually improve energy performance				
Account for legal and regulatory compliance				
Identify current energy sources including facilities, equipment, systems, processes and personnel working for, or on behalf of the organization that significantly affect energy use and consumption ("significant energy uses")				
Evaluate past and present energy use and consumption				
Estimate future energy use and consumption				
Identify, prioritize, and record opportunities for improving energy performance				
Establish an energy baseline using the information in the initial energy review; changes in energy performance shall be measured against the energy baseline				
Establish energy performance indicators appropriate for monitoring and measuring its energy where they are reviewed and compared to energy baseline				
Create, implement and maintain action plans that include the following for achieving the goals				
Designation of responsibility				
Means and time frame by which individual goals are to be achieved				
Statement of the method by which an improvement in energy performance shall be verified				

Statement of the method of verifying the results				
IMPLEMENTATION AND OPERATION				
Based on action plans and other outputs resulting from the planning process				
Ensure everyone is aware of the importance of conformity with the energy policy, procedures and requirements of the EnMS				
Ensure clarity of roles, responsibilities and authorities in achieving the requirements of the EnMS				
Communicate benefits of improved energy performance				
Communicate clearly the impact with respect to energy use and consumption of individual's activities and behaviors that contribute to the effect of energy performance within the EnMS				
Communicate internally with regard to the organizations energy performance and EnMS				
Decide and document whether to communicate externally about the energy policy, EnMS and performance				
Produce the following EnMS documentation with appropriate update controls				
Scope and boundaries				
Energy Policy				
Energy objectives, targets, and action plans				
Establish and set criteria for the effective operation and maintenance of significant energy uses where their absence could lead to significant deviation from effective energy performance				
Communicate the operational controls to people working in the organization				
Consider energy performance over the life of the new device during design of new systems, facilities, processes				
Establish and implement criteria for assessing energy use, consumption and efficiency over the planned operating lifetime when procuring energy using products, equipment and services				
Ensure that employees and contractors working on significant energy uses are competent on the basis of appropriate education, training, skills or experience. Provide training or take other actions to ensure competencies.				
CHECKING				
Ensure that key characteristics of its operations that determine energy performance are monitored, measured and analyzed at planned intervals including the following key characteristics				
Significant energy uses				
Relevant variables related to significant energy uses				
Energy performance indicators				
Effectiveness of the action plans in achieving the goals				
Audit of actual verses forecasted energy consumption				

Compliance with regulation				
Audit of EnMS on planned intervals to ensure the system is still effectively supporting improved energy performance				
Documenting, planning and executing corrective actions to address and correct nonconformities				
MANAGEMENT REVIEW				
At planned intervals top management shall examine the following				
Input				
Follow-up actions from prior management reviews				
Review of energy policy				
Review of energy performance and supporting energy performance indicators				
Compliance status with regulation				
Extent to which energy goals have been met				
Status of corrective actions and preventive actions				
Staff recommendations for improvement				
Output (expected actions)				
Improved energy performance of the organization				
Change to the energy policy				
Change to the energy performance indicators				
Change to the goals				
Change to allocation of resources				

8. Conclusion

This document looks to provide the formal framework for implementing a successful energy management system and program. The combined ISO 50001 international standard along with published ANSI/SCTE standards arm the cable industry with the tools necessary to achieve higher energy efficiencies and greater energy cost avoidances, thus allowing cable operators to be even more competitive in the fast paced, technology driven, energy dependent telecommunications industry.