MODULE 5: ENERGY MANAGEMENT SYSTEM (ENMS): ISO 50001: 2018







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INTRODUCTION

INTRODUCTION

1 Introduction

- Energy management makes good business sense as energy costs is a significant portion in an organisation's budget.
- A systematic focus on energy management, through optimum use of resources and reduction in wastes, is expected to reduce cost. It can also lead to increased production, improved energy performance, higher profits, and reduced impacts due to rising energy prices.
- In order to manage energy well, an organization requires an effective Energy Management System (EnMS) to be established, implemented, maintained and continually improved.
- Two ways to manage energy are:
 - o By developing and implementing their own Energy Management System.
 - o By implementing Energy Management System conforming to ISO 50001.



ISO 50001 ENERGY MANAGEMENT SYSTEMS (ENMS)

ISO 50001 (ENMS)

1 Introduction

- ISO 50001 is based on the Management System Model.
- To support longer term efforts for capital intensive energy-efficient technologies.
- International Organisation for Standardisation (ISO) had released the first version of 'ISO 50001 Energy Management Systems (EnMS)—Requirements with guidance for use' in June 2011 and revised version of ISO 50001:2018 in August, 2018.



EnMS context

- Continually improve energy management system
- Continually improve energy performance
- Achieve intended outcome(s)

Rectangular Snip

Promotes.

supports

sustains

and

Energy management system

Set of interrelated or interacting elements of an organization such as:

- policy
- objectives
- energy targets
- energy baselines
- energy performance indicators
- internal audits
- addressing non-conformities
- procurement processes
- design

Energy performance improvement

Improvement in measurable results of:

- energy efficiency, or
- energy consumption related to energy use, compared to the energy baseline

Achievement of other intended outcomes such as:

- reduced cost of energy
- meet overall climate change goals
- · improved reliability
- · increased use of renewables

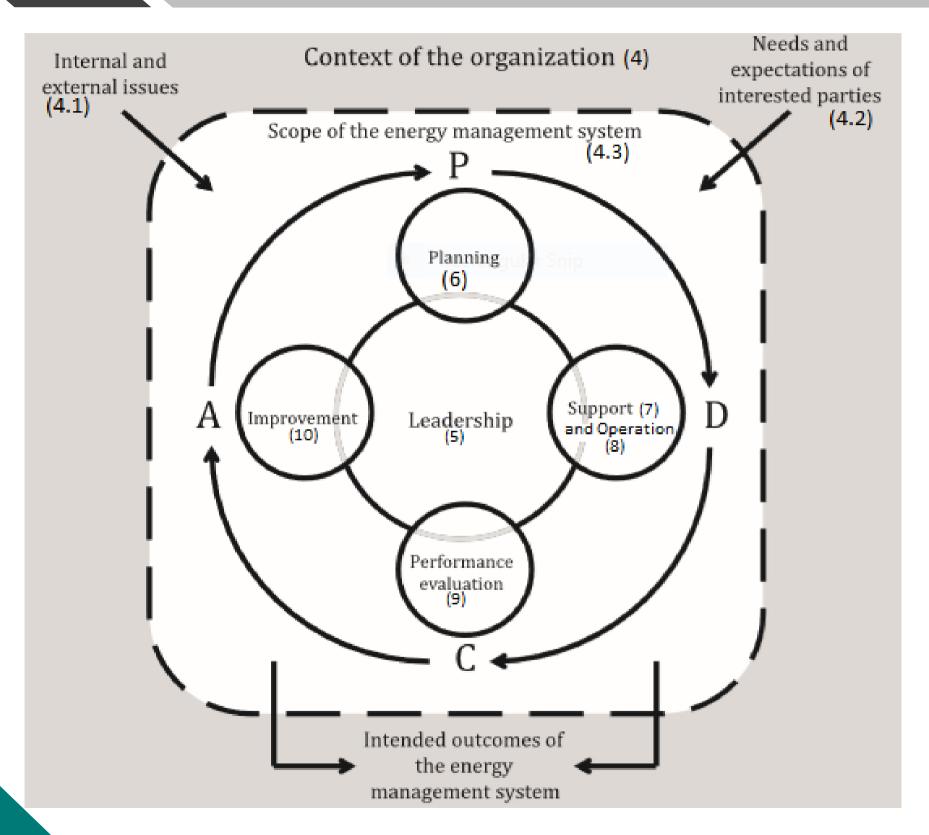
Continual improvement of the EnMS

in terms of:

- suitability
- adequacy
- effectiveness
- alignment with strategic direction



Plan-Do-Check-Act (PDCA) cycle

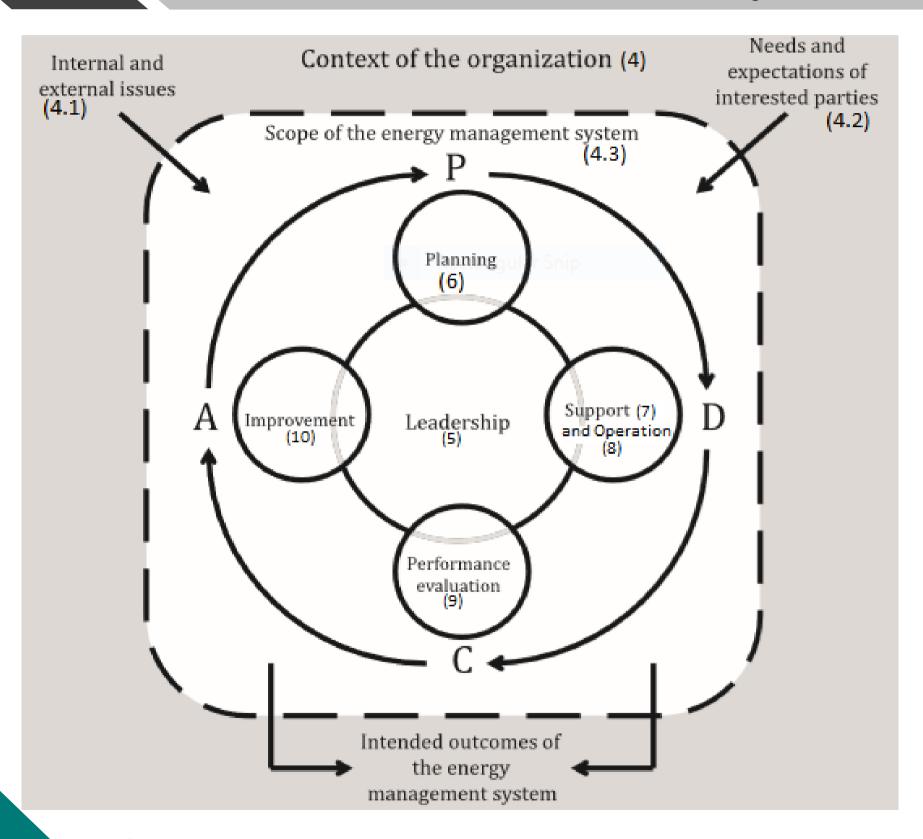


The PDCA Approach to EnMS

Plan: Understand the context of the organization, establish an energy policy and an energy management team, consider actions to address risks and opportunities, conduct an energy review, identify significant energy uses (SEUs) and establish energy performance indicators (EnPIs), energy baseline(s) (EnBs), objectives and energy targets, and action plans necessary to deliver results that will improve accordance performance in with the organization's energy policy.



Plan-Do-Check-Act (PDCA) cycle



The PDCA Approach to EnMS

- Do: Implement the action plans, operational and maintenance controls, and communication, ensure competence and consider energy performance in design and procurement.
- Check: Monitor, measure, analyse, evaluate, audit and conduct management review(s) of energy performance and the EnMS.
- Act: Take actions to address nonconformities and continually improve energy performance and the EnMS.



Benefits of Implementing ISO 50001

- Provide organizations with a well-recognized framework for integrating energy efficiency into their management/business practices.
- Provide a logical and consistent methodology for identifying and implementing improvements that can contribute to a continual increase in energy efficiency across the facilities.
- Assist organizations to better utilize existing energy consuming assets, thus reducing costs and/or avoiding expanding capacity.
- Offer guidance on benchmarking, measuring, documenting, and reporting energy efficiency improvements.
- Lead organizations to meet overall climate change mitigations goals by reducing their energy related greenhouse gas emissions.
- Assist facilities in evaluating and prioritizing implementation of state-of-the-art energy-efficient technologies.



5 Energy Policy

- The Energy Policy should clearly state organisation's energy priorities.
- ISO 50001 requires that the energy policy must demonstrate the commitments at least for
 - o Continual improvement of energy performance and the EnMS.
 - Availability of information necessary resources to achieve its objectives and energy targets.
 - o Satisfy applicable legal and other requirements related to energy efficiency, energy use and energy consumption.
- An Energy Policy is the foundation for developing an organization's EnMS through all phases of planning, implementation, operation, performance evaluation and improvement.



Strategic Planning to address risk and responsibilities

Planning inputs

Strategic Planning

Planning outputs

Internal and external issues (see 4.2)
Needs and expectations of interested parties (see 4.2)

Identification of risks and opportunities (see 6.1.1)

Actions to address risks and opportunities (see 6.1.2)



ISO 50001 (ENMS)

Planning inputs

Planning

Planning outputs

Energy Review

- Current energy types
- Past and current energy uses
- Past and current energy consumption based on measured data to the extent possible and remaining through engineering estimation

Energy review (6.3)

a.Based on energy consumption and/or identified opportunities for energy performance improvement, determine SEUs

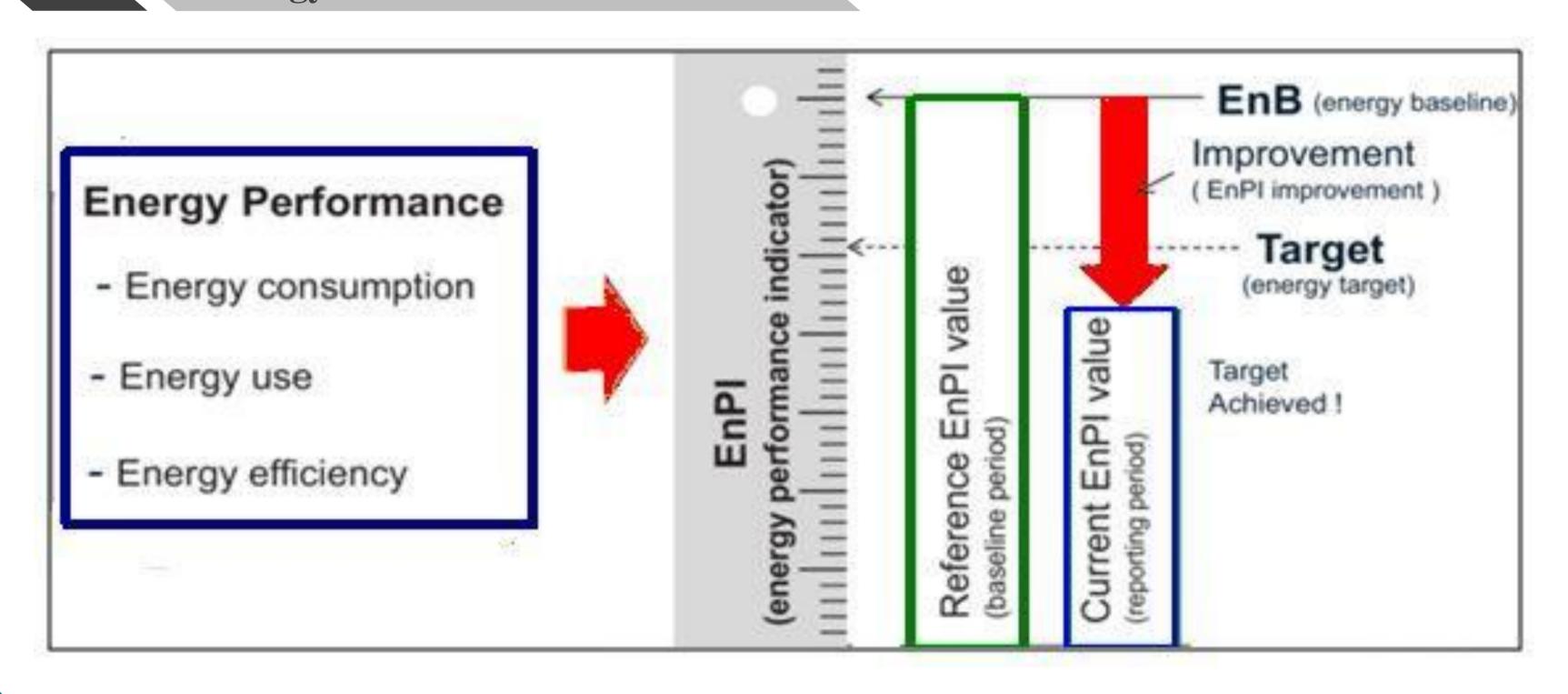
b.For SEUs, determine:

- relevant variables
- current energy performance
- personnel
- Determine and prioritize opportunities for improving energy performance
- d. Estimate future energy use(s) and energy consumption based on projected energy consumption and energy savings

- Energy use and consumption trends
- Future energy use and consumption
- Opportunities for energy performance improvement
- SEUs
- EnPIs
- EnBs
- Energy objectives, energy targets and action plans
- Energy data collection plan

- To improve energy performance, it is necessary to understand how, why, and where energy is being consumed and to identify where opportunities to improve exist.
- The energy review is the analytical part of tactical energy planning process.
- Its purpose to obtain an overall picture of an organisation's energy use.







ISO 50001 (ENMS)

9 Energy Baseline

- Energy Baseline is defined as the quantitative reference or references providing a basis of comparison of energy performance.
- The Energy Baseline is the reference for measuring energy performance over time.
- Baseline is always pertaining to a period which is known as baseline period This period should be representative of one complete cycle of the variations in the organizational operation



1 Introduction

- Documented Information is defined as the information required to be controlled and maintained by an organization and the medium on which it is contained.
- It can be in any format and media, and from any source.
- Certain amount of documented information is required in the EnMS.



1 Introduction

Clauses

- Scope and Boundaries of the EnMS (4.3)
- Energy Policy (5.2)
- Objective and Targets (6.2.2)
- Action Plans for achieving energy objectives and targets (6.2.3)
- Methodology and criteria used to develop the energy review (6.3)
- Energy review results (6.3)
- Method for determining and updating EnPIs (6.4)
- EnPIs Values (6.4)
- EnB(s), relevant variable data and modifications to EnB(s) (6.5)
- Data to be collected and retained (6.6)



1 Introduction

Clauses

- Details on measurement, monitoring and other means of establishing accuracy and repeatability (6.6)
- Evidence of competence (7.2)
- External origin (7.5.3)
- Operational planning and control (8.1)
- Design activities (8.2)
- Results of the investigation and response to significant deviation (9.1.1)
- Results from monitoring and measurements (9.1.1)
- Results of the evaluation of compliance and any action taken (9.1.2)
- Evidence of the implementation of the audit programs and the audit results (9.2.2)
- Evidence of the results of management reviews (9.3.4); and
- Nature of nonconformities and subsequent action taken as well as on results of any corrective action (10.1)



Open Discussion

Questions?

Thank You

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