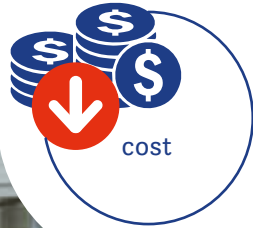
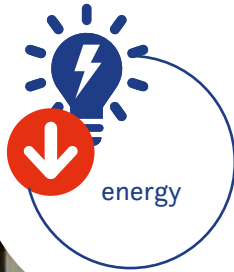
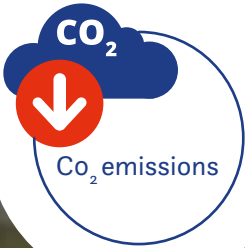


Conserve energy for profitability



Learn about ISO 50001 Energy Management System

This publication was produced with the financial assistance of the European Union and the German Government. The views expressed herein can in no way be taken to reflect the official opinions of the European Union and the German Government.

Published by:

Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH

Contact:

Nigerian Energy Support Programme (NESP)
No 2 Dr. Clement Isong Street, Asokoro
Abuja/Nigeria
Contact: nesp@giz.de



This project is funded by the European Union & the German Federal Ministry for Economic Cooperation and Development (BMZ)

Authors:

Bedakaino Usoko Ngubane, Joshua Yari Garba, Nico van der Woude (GFA Consulting Group GmbH)

Photo Credits

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
GIZ / Thomas Imo/photothek.net GIZ / Michael Tsegaye Josef Buchinger during site visits to Unilever Nigeria Plc, Nigerian Foundries Ltd., Jubali Bros and GB Foods.

Date of Publication:

2021

About the Nigerian Energy Support Programme:

The Nigerian Energy Support Programme (NESP) is a technical assistance programme, co-funded by the European Union and the German Federal Ministry for Economic Cooperation and Development (BMZ). It is implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH in collaboration with the Federal Ministry of Power. The programme aims to enable and foster investments in the Nigerian domestic market for renewable energy, energy efficiency and rural electrification.

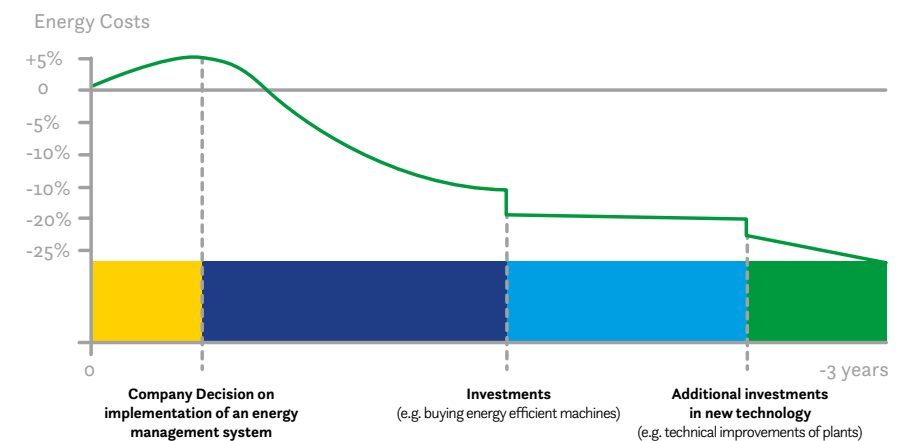
Introduction

This leaflet gives an overview of an Energy Management System (EnMS) based on ISO 50001 standard; its benefits; steps to becoming ISO 50001 compliant and benefits of ISO 50001 certification. Additionally, it provides information on opportunities available to companies interested in implementing an EnMS.

What is an Energy Management System (EnMS)?

Managing energy in a systematic way is the best way to achieve continual improvements in energy efficiency in industry. The resulting cost reductions help to strengthen competitiveness and ongoing business sustainability. Most companies do not have a systematic approach to improve energy efficiency and would benefit from the integration of an Energy Management System (EnMS) into their facilities e.g. an EnMS based on ISO 50001. This is an integrated and systematic approach to manage energy.

Figure 1. Illustration of continuous cost reduction with EnMS



Source: CleanEnergy Ministerial (2013), adapted from Kahlenborn et al. (2012).

The goal of energy management is to achieve organisational objectives at minimum energy consumption and cost. It involves all measures that are planned and implemented to ensure minimum energy consumption for a given activity.

Energy management harnesses organisational and technical processes, data and human resources to drive down total energy consumption and continually improve energy performance.

An Energy Management System (EnMS) systematically records energy consumption and use and serves as a basis for investment to improve energy efficiency. A functioning EnMS helps a company to comply with the commitments made in its energy policy and to continually as well as systematically improve its energy performance.

What is ISO 50001?

The ISO 50001 Energy Management System Standard, is a set of criteria issued by the International Organization for Standardization (ISO), which defines a structured and coordinated approach to energy management. An organisation's EnMS can be assessed against the Standard to determine compliance which can lead to certification. ISO 50001 is being adopted in many countries across the globe.

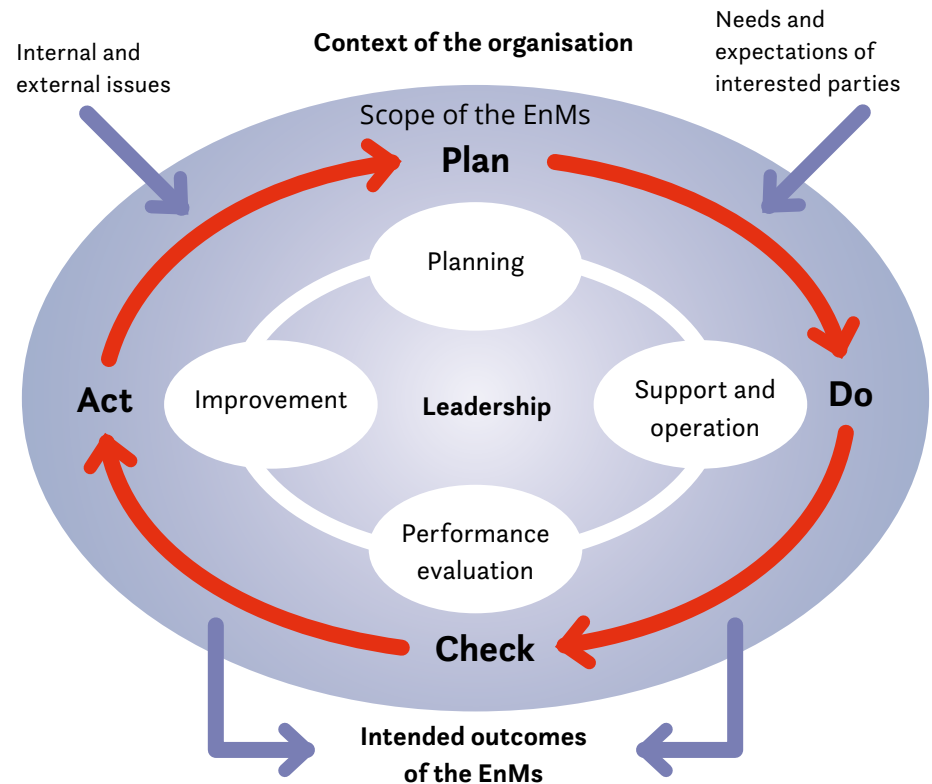


Plan, Do, Check, Act (PDCA cycle)

The PDCA cycle is an important element of ISO 50001. It is a model for steering continuous energy performance improvement in an organisation. The cyclical nature ensures that quality improvement is constantly under attention. The cycle consists of four steps:

- ✓ **Plan** Make a plan, describing the goals you want to achieve.
- ✓ **Do** Execute the plan.
- ✓ **Check** Compare the results with what you wanted to achieve.
- ✓ **Act** In case of deviation, take measures to achieve the desired results. The cycle starts again. (See figure 2).

Figure 2. PDCA cycle



Benefits of Implementing an EnMS based on ISO 50001

Implementation of an EnMS based on ISO 50001 brings a company many benefits (7Cs):

- **Consumption**
Reduction of energy consumption
- **Carbon**
Reduction of greenhouse gases and other harmful emissions
- **Cost**
Improved energy performance from an EnMS results in reduced costs which improves profitability, competitiveness and business sustainability
- **Competence**
An EnMS based on internationally recognised principles is considered as a plus by capital providers
- **Competitiveness**
Saving energy through an EnMS reduces costs and improves competitiveness
- **Continuity**
An EnMS improves continuity of the company: the responsibilities for energy management are evenly spread in an organisation, because procedures are formalised, and a system is in place
- **Compliance**
The amount of environmental legislation and regulation is expected to increase. An EnMS is a sound basis for compliance to these.

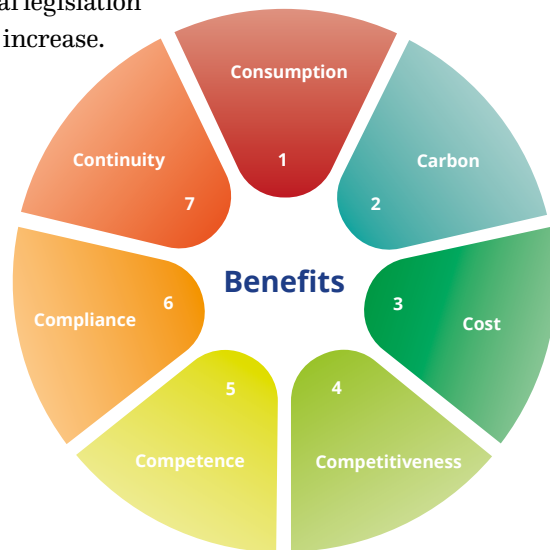


Figure 3. Benefits of EnMS



What an EnMS can achieve

- ✓ Management focus
- ✓ Systematic activity
- ✓ Actively managing energy use and costs, reducing exposure to rising energy costs
- ✓ Obligation to train and raise awareness
- ✓ Obligation to provide resources
- ✓ Document savings for internal and external use (e.g. emission credits, legal reporting requirements)
- ✓ Reduce GHG emissions without negative effect on operations
- ✓ Continuity through changes of personnel

Energy and
Cost Savings

Continual
Improvement

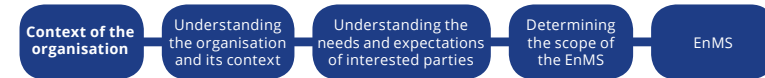
Environmental
Benefits

Key Steps to becoming ISO 50001 Compliant

To establish an ISO 50001 compliant EnMS, several steps have to be considered:



Step 1 Context of the organisation



External issues, like national or sectoral objectives, requirements or standards and internal issues like financial resources, e.g. asset management can impact a companies' strategic energy objectives. These issues have to be considered in order to decide the scope of the EnMS. The scope is the extent of activities, facilities and decisions that an organisation addresses through an EnMS. Examples are, a process, a group of processes, a site, an entire organisation or multiple sites under the control of an organisation. It is important to include in the scope, all sources and fuels such as electricity, oil and gas.

Step 2 Leadership



The firm commitment of Top Management is decisive for the successful implementation and continual improvement of the EnMS. The Top Management has to ensure that the EnMS requirements are integrated in the business processes, resources are available, communication is effective, continual improvement is promoted and the EnMS meets intended outcomes. It has to establish an appropriate energy policy, which provides a framework for setting objectives and energy targets. Top Management also has to ensure that organisational roles and responsibilities are assigned appropriately, and that those responsible, report on energy performance.

Step 3 Planning



Planning refers to actions to address risks and opportunities relating to energy performance and legal requirements. Planning refers also to setting EnMS objectives and planning of activities to achieve them. Finally, planning refers to energy review (Analysis of energy use and consumption, Establishing Energy Performance Indicators, Establishing Energy Baseline(s), Planning for collection of Energy data).

Step 4 Support



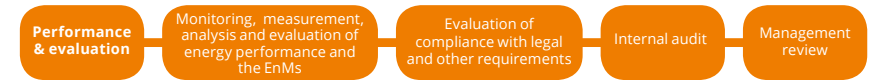
This step covers fulfilling key requirements needed to implement an EnMS with reference to resources, competences, awareness, effective internal and external communication and documented information.

Step 5 Operation



Operating criteria for controlling processes related to significant energy uses (SEUs) have to be established and implemented and outsourced SEUs or processes related to SEUs need to be controlled. Opportunities to improve energy performance have to be considered and operational controls have to be implemented in the design of new SEUs. Finally, criteria for evaluating total life impact on energy performance when procuring products, equipment and services which impact on SEU's have to be established and implemented.

Step 6 Performance Evaluation



Regular checking of energy performance and the achievement of energy objectives, targets and action plans is an essential part of the EnMS. This is to ensure that the implementation actions are producing the desired results and achieving the targeted energy efficiencies. It is also an important part of continual improvement. The checking phase includes: Monitoring, Measurement and Analysis; Reviewing compliance with legal obligations; Internal audits; Nonconformity, corrective and preventive action and Record control.

Step 7 Improvement



Following performance evaluation, this step covers issues that need to be addressed such as non-conformities, corrective action and continual improvement to enhance performance going forward.



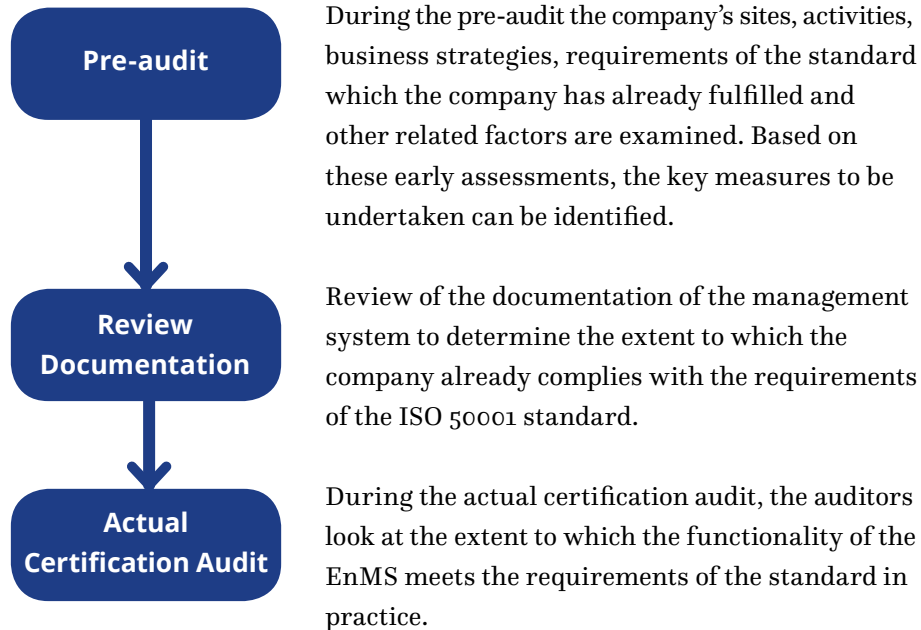
Certification

A company which has fully introduced an EnMS has the option of getting a certification by an independent external certifier. In doing so, the company increases the relevance of the EnMS. Certification supports the company's energy performance and environmental credentials. On receipt of the certificate the company has officially demonstrated that it has fulfilled the requirements of ISO 50001. Certifications are carried out by an independent third party.

Certificates should be renewed on a regular basis, usually every 3 years. That includes conducting an audit in order to check the continual improvement of energy performance and the EnMS. Careful selection of a certification body is important as this business relationship is to last for a long time.

Steps to certification

In general, certification takes place in a few steps.



Systematic assessment of performance

To ensure continual improvement of the management system, annual audits are conducted by the certifier. Performance is thus assessed systematically, enhanced and, if required, optimised. In this way, non-conformities can be detected at an early stage and relevant corrective measures are taken. With a regular review audit by the certifier, the company can re-certify their EnMS every three years.

Benefits of achieving ISO 50001 certification

Certification allows businesses to establish a practice around the use of energy that reduces business risk and improves productivity and operations. The ISO 50001 standard helps organisations boost energy productivity and cut costs, ultimately benefiting the organisation. ISO 50001 provides a framework in order to achieve your energy goals, reducing depletion of energy resources which in return helps mitigate climate change. It also improves the efficiency within the operations of the company.

Adoption of ISO 50001 in Nigeria

In Nigeria, the Standards Organisation of Nigeria adopted the ISO 50001 as a Nigerian Industrial Standard (NIS) and was published in 2017 as NIS/ISO 50001:2011. Although a voluntary standard, certification to ISO 50001 by industries is globally recognised as achieving good practice in energy management.





Official presentation of ISO 50001: 2011 certificates to GCL.

Success stories of ISO 50001 certification in Nigeria

In its first phase, the Nigerian Energy Support Programme supported the first two(2) companies (Grand Cereals Ltd., Jos and Aarti Steel Nigeria Ltd, Sango Ota) in Nigeria to achieve ISO 50001 certification.

In its second phase, the Nigerian Energy Support Programme is providing technical support to Nigerian industries for the implementation of Energy Management Systems. This support comprises of trainings for managers, energy audits, assessment of energy performance, identification of energy efficiency measures and investments required to implement them.

So far, over 45 energy engineers from selected manufacturing industries have been trained by NESP on the implementation of EnMS based on ISO 50001 Standard.

Support and mentoring from the NESP consultants helped Aarti Steel Nigeria Limited to quickly develop their own approach to an EnMS tailored to the business.

In particular, the training of its Energy Manager and members of the Energy Team, and an Energy Review conducted by the NESP, formed the bedrock for the successful implementation of EnMS at the company and the achievement of ISO 50001:2011 certification for the management system.

“ISO 50001 has really helped us as a company in identifying energy saving potentials. The continuous implementation of measures to harness these potentials have successfully reduced our specific energy consumption by 3.1 % in the first year of implementing an energy management system at Grand Cereals Limited and receiving ISO 50001:2011 certification.”

*Afeez Agbolagade Sulaiman,
Energy Manager Grand
Cereals Limited, Jos.*

To learn more about ISO 50001 Energy Management System, kindly contact:

The Federal Ministry of Power

Power House

Plot 14, Zambezi Crescent, Maitama

Abuja/Nigeria

Contact: Director, Renewable Energy and Rural Power Access

Standards Organisation of Nigeria

No.52, Lome Crescent, Wuse Zone 7

Abuja/Nigeria

Contact: Director General/CEO

Nigerian Energy Support Programme (NESP)

No 2 Dr. Clement Isong Street, Asokoro

Abuja/Nigeria

Contact: nesp@giz.de