

**ENERGY  
MANAGEMENT  
SYSTEM**

ISO 50001 COMPLIANT

BROCHURE

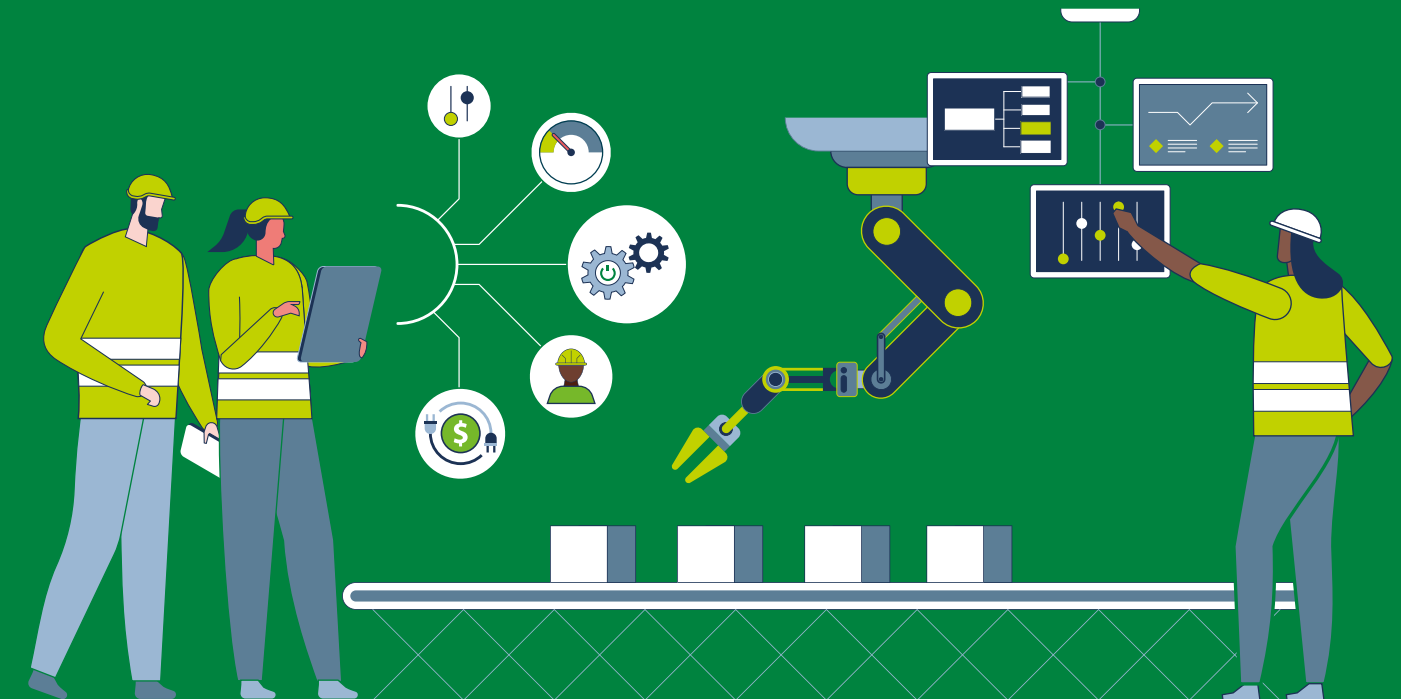


INDUSTRIAL  
ENERGY  
ACCELERATOR



# Energy Management System (EnMS)

## Energy Efficiency Solutions Series



## Introduction

Are you aware of how much energy is used by various systems at different stages throughout your production process? If you answered 'yes', then you are one step ahead of many industrial companies. More often than not, energy is accepted as a fixed cost in business, an unavoidable input that simply must be absorbed. The reality is that energy can be optimised and managed in a way that drastically improves the bottom line, reduces costs, increases productivity, boosts employee morale and contributes to global environmental targets.

There is no shortage of resources available for industrial managers looking to make their company more energy efficient. In fact, there is so much information it can often be difficult to know where to start or what is worth researching further. This Energy Management System (EnMS) knowledge kit provides an overview for leadership teams on what an EnMS is and how implementing one can bring added value to your organization. In this kit you will find insights from UNIDO's global experts as well as external links to recommended references, manuals and technical guides. The introductory video, case studies and this brochure are perfect starting points for generating awareness about the benefits and opportunities that an industrial EnMS can provide for your organization.

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### Did you know?

**Basic 'no-cost' energy saving management opportunities can help companies reduce their energy use and costs in some cases by up to 30 per cent.**

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## What is an EnMS?

An Energy Management System (EnMS) is a framework for energy consumers including industrial, commercial and public sector organizations to manage their energy use. It helps companies identify opportunities to adopt and improve energy-saving technologies, including those that do not necessarily require high capital investment. In most cases, the successful implementation of an EnMS requires specialised expertise and staff training.

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**When I first meet with the companies, I ask some very simple questions such as 'what type of energy do you use? Where do you use it? Which part of your business uses the maximum amount of energy?'. Often the companies do not know because they simply haven't measured or monitored their energy use. When they do measure their energy use after we meet, they are usually very surprised.**

**For example, one company I work with thought that the production arm of their business consumed around 35 per cent of their total energy usage when in fact it was 65 per cent! As a result of this finding, the production director of the company started to analyse the running times of his machinery, when different conveyors were active or idle, the usage of certain lights and so on. And, just because they paid a little more attention than usual, within a month the company's energy bill had dropped by 10 per cent.**



**Samir Khafagui**, Energy Management Systems Expert

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# Six signs you need an EnMS



## ADDITIONAL RESOURCES

### What is an EnMS?

#### WATCH

Energy management systems explained

#### DOWNLOAD

→ UNIDO'S practical guide for implementing an energy management system

→ 13 ways industrial businesses can be more energy efficient

### Six signs you need an EnMS

#### READ

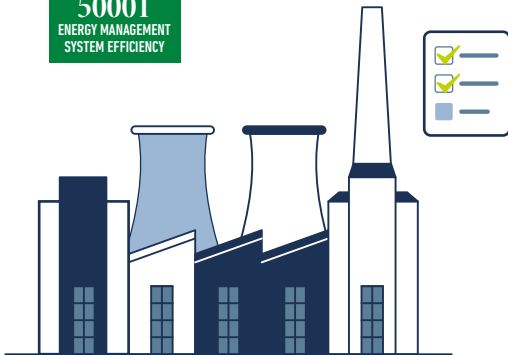
How energy efficient is your industrial company?

# ISO 50001

## The international EnMS standard

Established in 2011 by the International Organization for Standardization in coordination with UNIDO, ISO 50001 is a globally regarded framework for organizations to efficiently manage their energy. Applicable to all types and sizes of organizations and sectors, ISO 50001 is based on the core concept of continuously improving energy performance. System components include the creation of an energy policy, objectives for improving the efficient use of energy, a timeline with target dates for meeting objectives and an action plan that specifies exactly how the organization's objectives will be met.

ISO 50001 certifications are granted by an accredited third-party agency. It is recommended that organizations interested in acquiring ISO 50001 certification contact and interview several accredited agencies before committing to one. Certification from independent experts gives external recognition that your EnMS conforms with all of the ISO 50001 requirements.



# The benefits

## There is a lot to gain from implementing an EnMS

### Save energy

For companies new to energy management, energy savings during the first two years range from 10 to 20 per cent. This can be achieved with little or no capital investment. In industrial production as a whole, energy savings of 25 to 30 per cent are possible in the medium term.

### Reduce your environmental footprint

Industrial energy consumption is one of the biggest drivers of carbon emissions worldwide. Improvements in industrial energy efficiency have been found to be one of the most important and cost-effective means of mitigating industrial greenhouse emissions. Globally, energy efficiency represents around 40 per cent of the greenhouse gas reduction potential that can be realized at a cost of less than 60 Euros per metric ton of carbon dioxide equivalent.<sup>1</sup>

### Reduce costs and find a competitive advantage

Energy costs can account for as much as one fifth of an industrial business' expenditure. Investing in energy efficiency can help to drastically reduce variable costs and lead to gains in competitive advantages including product price and the availability of capital for innovation.

<sup>1</sup> McKinsey&Company, 'Energy efficiency: A compelling global resource,' p 2, 2010.

## Increase ROI on machinery

Monitoring through an EnMS helps to identify and minimize machinery faults. This also helps to increase the lifespan of machinery through strategic and regular maintenance.

## Create new employment opportunities

Employment programmes which promote energy efficiency and the renewable energy sector have a tendency to create more jobs than investments in the traditional energy sector.<sup>2</sup> A net increase in jobs from energy efficiency, for the most part, is the result of two major changes: 1) an initial expenditure or effort that drives energy bill savings, 2) the subsequent adjustment in spending patterns brought about by that initial expenditure or effort.<sup>3</sup>

## Mitigate risks

When taking new approaches to improve energy efficiency, energy managers can also highlight underlying associated risks. Furthermore, as a direct result of reduced energy demand, a company's exposure to market volatility is also reduced as their fossil fuel consumption wanes. Therefore, energy efficiency proves to be an effective management tool to mitigate financial risk and energy shortages.

<sup>2</sup> Garrett-Peltier, H, "Green versus brown: Comparing the employment impacts of energy efficiency, renewable energy, and fossil fuels using an input-output model," Economic Modeling, pp. 439-47, 2017.

<sup>3</sup> American Council for an Energy Efficient Economy, "How Does Energy Efficiency Create Jobs?," fact sheet < <https://www.aceee.org/files/pdf/fact-sheet/ee-job-creation.pdf>>

## Improve bankability of company projects with better data

Capturing data via an EnMS helps to ensure better post-investment project performance. In many cases, financial institutions report there is a shortage of bankable projects. A wider application of energy management systems could help to increase the pool of bankable projects available for investment.



### ADDITIONAL RESOURCES

#### ISO 50001: The international EnMS standard

READ

More about ISO 50001

#### How it works

READ

UNIDO's EnMS e-guide

DOWNLOAD

Summary of UNIDO's EnMS training programme for companies and experts

#### The benefits

WATCH

Nurzat Myrsaliev on the benefits of industrial energy efficiency

READ

→ Our country experts on the exciting potential of industrial energy efficiency

→ Industrial energy efficiency, the invisible climate solution

# What resources are required?

## INVESTMENT

### Start with no-cost and low cost solutions

During the initial phase of an EnMS implementation, the key principle is to begin with achievable no and low-cost energy performance improvements.

As the EnMS matures and improves over a number of years, no-cost and low-cost opportunities to save energy progressively diminish in favour of more capital demanding measures. This can include electric motor and machinery replacement, investments in economizers to capture residual heat in boiler systems, and installation of variable speed drives. In an ideal scenario, the additional investment required for the replacement of equipment, major upgrades and/or software is covered by the cost savings made in the initial no-cost and low-cost phase of the EnMS.

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Innovation does not have to be a big ticket item. It can be anything that involves getting your business out of its comfort zone and encouraging your team to work smarter to face this challenge together. Reducing operational costs through efficient energy management is one example of inexpensive innovation, which can be applied in the immediate term.”



**Mohammad Iskandar Majidi**, Energy Efficiency and Solar Thermal Application Technical Expert, UNIDO-Malaysia



## PERSONNEL

### At least one dedicated energy manager and support from a designated team

It is recommended that a dedicated energy manager, who reports to top management, is appointed to monitor the continuous progress of the EnMS. It is also recommended that numerous personnel involved in an 'energy team' are able to commit at least two weeks on EnMS development, implementation and certification on an annual basis.



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In the management system field we often talk about the importance of top management involvement. But, in reality, there is a need for involvement from people at all levels. Critically, an effective energy management system requires a dedicated energy management team. This is a core group of people that has a good understanding of the various parts of the organization and the energy implications.”



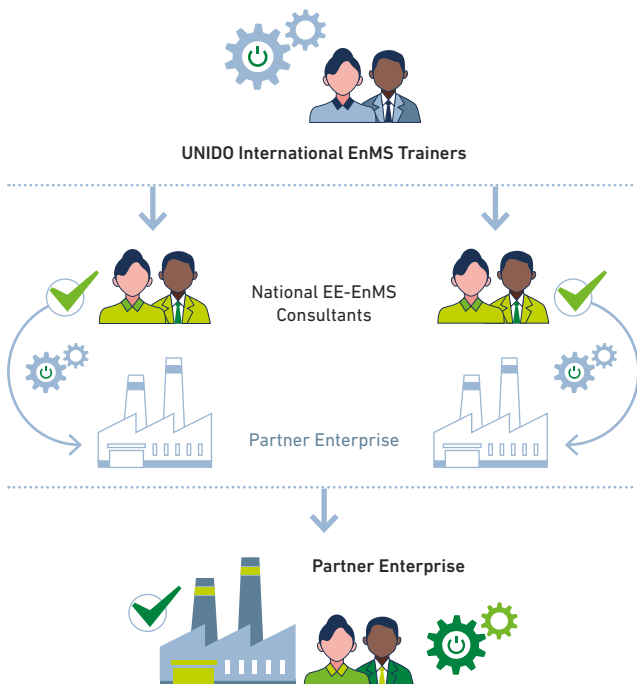
Wendy Da Cruz, Energy Management Systems Specialist

# UNIDO's approach

The United Nations Industrial Development Organization has a long history of delivering technical advice and practical support for the implementation of EnMS worldwide.

In **2010**, a team of two international energy experts conducted the very first energy management training programme for 60 industry managers, personnel and practitioners in South Africa.

Today, UNIDO experts, trainers and technicians help to implement the internationally regarded **International Organization of Standardization (ISO) 50001 EnMS in 20 countries, with plans to extend to over 30. The incredible results speak for themselves.** UNIDO's unique approach brings international experts together with national trainees and host companies, creating a ripple effect of knowledge sharing, simultaneously fostering demand and supply in a new national market for energy efficiency services.



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When we initially designed the EnMS programme, we knew we had to go beyond the classroom and provide trainees with a hands on experience of implementation. Enterprises need to be convinced of the benefits by reaping them in real time within their own work. Our challenge now is to scale-up and expand what we started 10-years ago.”



Marco Matteini, UNIDO Programme Manager

## ADDITIONAL RESOURCES

**UNIDO's approach**

**WATCH**

Morocco accelerates its energy transition

**DOWNLOAD**

→ Morocco country project case study

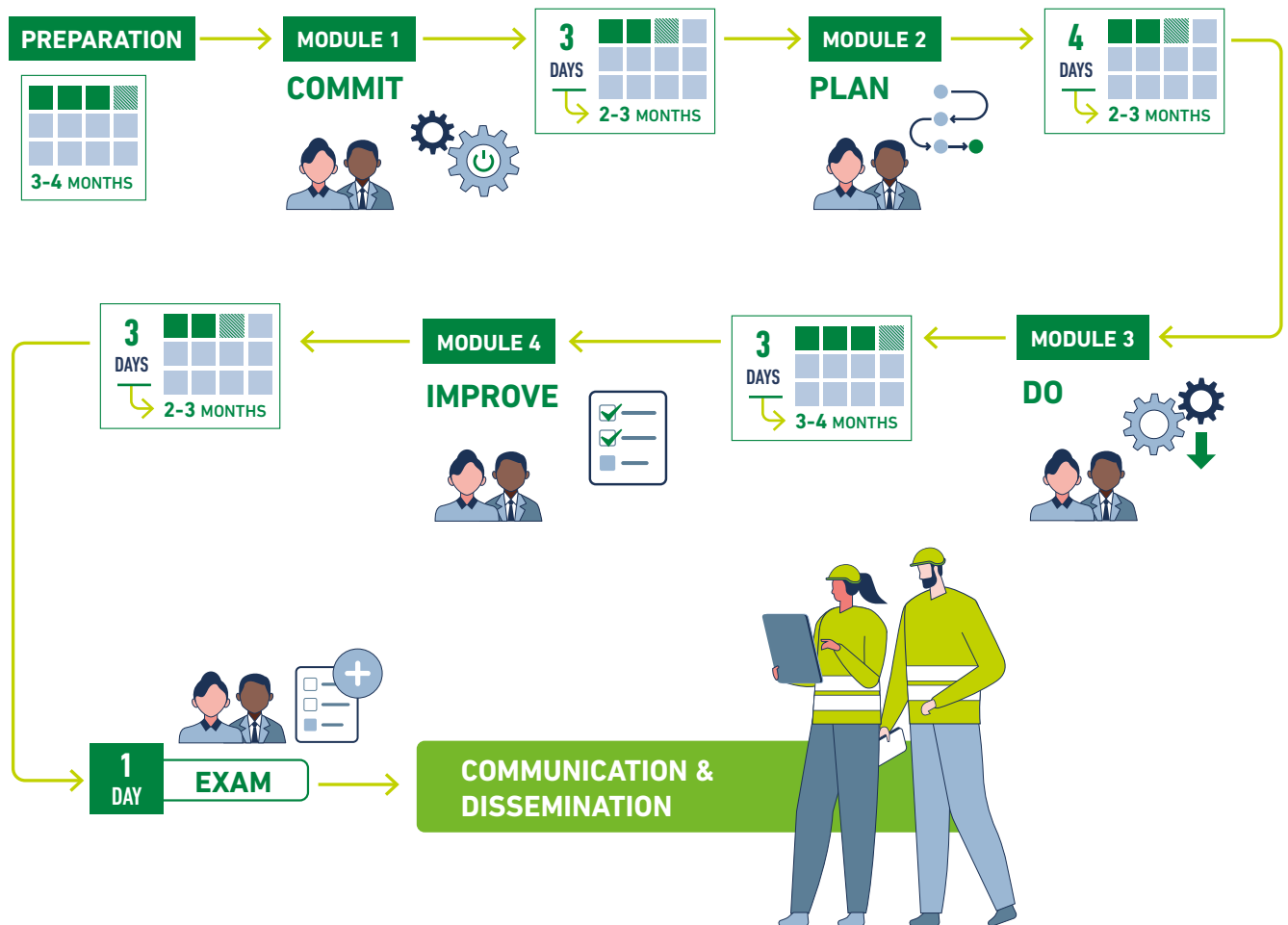
→ Practical guide for implementing an energy management system



UNIDO's comprehensive 18-month training programme takes participants beyond the classroom and guides them through a hands on process of action planning, implementation and continuous energy saving improvements. By the end of the training, host companies and participating organizations gain an energy management system that is uniquely tailored to their needs. This includes specialised tools developed by UNIDO, a dedicated energy policy as well as baseline metrics and data, which helps energy management teams stay on track and ultimately achieve their energy saving targets long into the future.

## Training and implementation programme for companies and experts

### Combining expertise, skills development and results



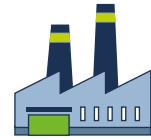
## ACHIEVEMENTS



**650+**  
EnMS EXPERTS  
QUALIFIED



OVER  
**3500**  
COMPANIES TRAINED  
in EnMS

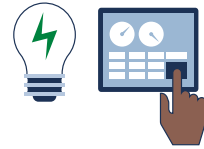


MORE THAN  
**500**  
COMPANIES  
directly supported  
throughout EnMS  
IMPLEMENTATION

MORE THAN  
**1,000**  
DECISION MAKERS, POLICY MAKERS,  
FINANCIAL AUTHORITIES, SERVICE  
PROVIDERS AND TOP MANAGEMENT  
directly engaged in training and related  
initiatives



**4-15%**  
OF ENERGY SAVED  
per company in the first year of  
EnMS implementation with little  
or no capital investment



CUMULATIVE  
PRIMARY ENERGY  
savings exceed  
**25,000 GWh**



MORE THAN  
**\$400** MILLION USD  
saved in CUMULATIVE  
ENERGY COST  
SAVINGS



MORE THAN  
**10** MILLION TONS of  
CO<sub>2</sub> EMISSIONS avoided,  
roughly equivalent to the  
carbon sequestered by  
150 million 10-year-old  
trees<sup>5</sup>

<sup>5</sup> United States Environmental Protection Agency, 'Greenhouse Gas Equivalencies Calculator.'

## Your EnMS questions answered

UNIDO has steadily grown its cohort of international and national energy management experts over the past decade. With collective experience in all of the world's major industrial countries and regions our team of specialised consultants have a long track record of leading organizational teams to achieve impressive EnMS results. In this kit you will find a video where two of our experts answer common questions about EnMS.



### Wendy Da Cruz

Wendy has been involved in energy management system consulting, training and auditing since the early nineties. She is one of the first successful graduates of the UNIDO EnMS Expert programme which began in South Africa.



### Liam McLaughlin

Liam was one of the initial two international experts to deliver UNIDO's EnMS training programme for companies and experts. Over the past 10 years Liam has contributed to the delivery of this training programme in more than 10 countries in Europe, Africa and Asia.

## About the Energy Efficiency Solutions Series

**The Industrial Energy Accelerator is a UNIDO-led network of international initiatives working to inspire global action on industrial energy efficiency.** Throughout 2020, the Accelerator is drawing on its collective wealth of experience and expertise to produce a series of knowledge kits on industrial energy efficiency. These will cover five key energy efficiency solutions: Energy Management System; Efficiency Solutions for Motor-driven Systems; Industrial Heat; Industrial Cooling; as well as Energy Metrics and Performance Indicators. Through this series, the Accelerator hopes to inspire and equip efficiency practitioners to take the first step towards implementing the different solutions, and to promote them amongst peers and decision-makers.



## NEXT STEPS

Visit our knowledge hub for more information on the processes and technology that will help you achieve energy efficiency in your company.

## CONTACT

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to find out how UNIDO'S Industrial Accelerator can help you.

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