ISO 50001
EVERYTHING YOU NEED TO KNOW

The Complete Guide about ISO 50001 for Companies that wish to save money in Energy.

DEXMA
ENERGY INTELLIGENCE

INDEX

A COMPLETE GUIDE TO ISO50001 FOR COMPANIES

T he publication of ISO 50001 has made it possible for companies who go ahead and obtain certified status to achieve systematic savings in energy usage, and consequently in costs.

But the process of implementing ISO 50001 is not straightforward, and this has caused a fair few headaches both for energy sector professionals and for company managers.

For all those who are in the midst of this process, or considering whether or not it is worthwhile to begin it, DEXMA has published this Complete Guide to ISO 50001and how to implement it in your business.

WHAT IS ISO 50001?

ISO 50001 is an International Regulation of Standardization, especially created for energy management systems.

All of the standards created by the ISO, the International Organization for Standardization, are voluntary, and therefore so is ISO 5001. ISO is an independent and non-governmental organization.

However, ISO 50001 has considerable advantages for organizations who consume energy and must control this significant operating cost. The advantage of ISO 50001 is that it is designed so that any company can use it, regardless of their activity, size or geographical location.

The ISO 50001 standard was published on the 11th June 2011 under the title "Energy Management Systems- requirements with guidance for use".

Thanks to the significant advantages it can offer to companies that adopt and implement it, in 2014 ISO 50001 had already achieved a 40% annual rise in implementation.

The majority of the certified companies are concentrated in Europe, where 80% of the global total are located. Half of the certified companies on a global scale are concentrated in Germany, where ISO 50001 has been driven forward thanks to the restrictive energy legislation. The country with the second most certified businesses is the United Kingdom.

The ISO 50001 establishes the process to define, implement and maintain an energy policy, a process that should be supported by the senior management of the organization.

It seeks a commitment, from the core of the business- that is to say, from those who make the key decisions- to systematic energy conservation.

WHAT IS THE PURPOSE OF ISO 50001?

Y ou may well be asking yourself this question, given that this is a voluntary implementation. It is important not to confuse concepts when talking about ISO 50001.

It is not a 'law', it is a methodology. It proposes a process that will guide you when implementing an efficient system with which to manage your energy, generate savings, and consolidate those savings. .

The most basic and essential purpose of the regulation is that it makes it easier for public or private organizations to implement an energy management system.

Professionals who have already implemented it tend to highlight six key points concerning the utility of ISO 50001:

1. COST SAVINGS:
   a. Derived from a reduction in energy consumption.
   b. Derived from savings in production costs.
2. REDUCTION IN ENERGY CONSUMPTION.
   In addition to this reduction it has an impact on the reduction of C02 emissions and other harmful substances that contribute to climate change.
3. COMPLIANCE WITH LEGISLATION.
   Certain countries have developed specific laws relating to energy efficiency (we will return to such a case later on in this guide) requiring the implementation of ISO 50001 in specified businesses. In other cases the benefit of implementation is that it will score highly in bids or public competitions.
4. STANDING OUT AGAINST COMPETITORS.
5. ENHANCEMENT OF THE COMPANY IMAGE before clients, regulators, suppliers and shareholders.

HOW DO I IMPLEMENT ISO 50001? PREPARING THE COMPANY

T he ISO 50001 will impact upon all the processes of your company, and so the first thing that you must do is prepare your company!

Three prerequisites to have ready before beginning include: personnel, documentation and the necessary technology. Let's check them, one by one.

The Staff Needed

It is advisable for the company to have an Environmental Manager, who, whilst s/he may have other responsibilities, will lead the project internally. The Environmental Manager must be a capable decision maker and carry authority within the organization.

In addition, you may find it necessary to appoint a technical auditor. This figure is external to the company and is responsible for drafting the energy audit. The audit is not mandatory, but it is a good practice before implementing the Energy Management System (EMS).

Finally, the technological condition of the internal energy management equipment must be taken into account, alongside building maintenance or environment.

If the condition is too low, or else if workload restraints are such that the installation of the EMS cannot be undertaken internally, you will need an energy consultant or energy services company (in DEXMA we work with more than 200 such businesses worldwide). The task of this person is to install your energy analysis technology and adjust and adapt it to the ISO 50001 standard.

Documenting the Process

Be careful with this step, because in order to comply with the regulation ISO 50001 it is necessary to document the following steps of the implementation process:

+ The energy policy of the business

+ The energy plan (energy review, baseline energy consumption, energy performance indicators, programme objectives

+ The results of monitoring and measurement. You should document the processes of testing and measurements, even if they are internal

+ The evaluation of legal compliance

+ The results of the internal audit and review carried out by the management of the organization

In addition, your organisation may document all those requirements considered appropriate.

ISO 50001 advises companies to have at their disposal, as a minimum, the monthly consumption of the last 12 months from all energy sources that are representative of the global energy consumption within the organization.

With this information at hand, you will be ready to begin the implementation process. And we are not simply talking about electricity. The implementation of ISO 50001 includes gas consumption, technical energy, diesel… Water, however, is beyond the scope of ISO 50001.

The Technology you Will Need

Implementing ISO 50001 will require you to manage your consumption data in real time. Only in this way will you be able to correctly measure your installation, monitor your progress and as such, guarantee the cycle of continuous improvement that is offered by ISO 50001.

Two fundamental technologies are involved when it comes to achieving this: energy efficiency hardware and software..
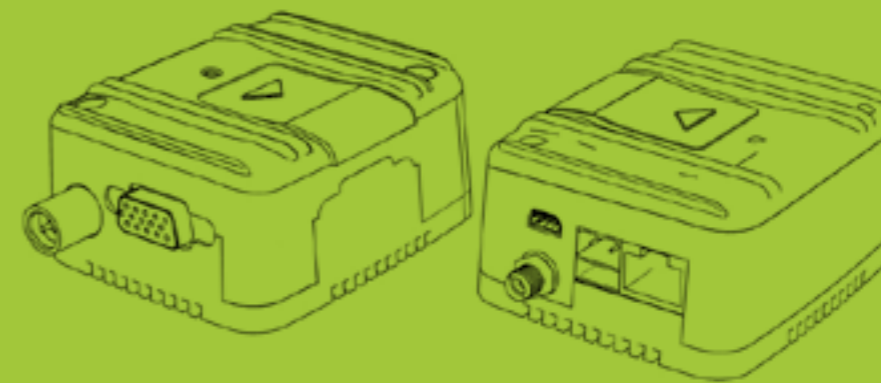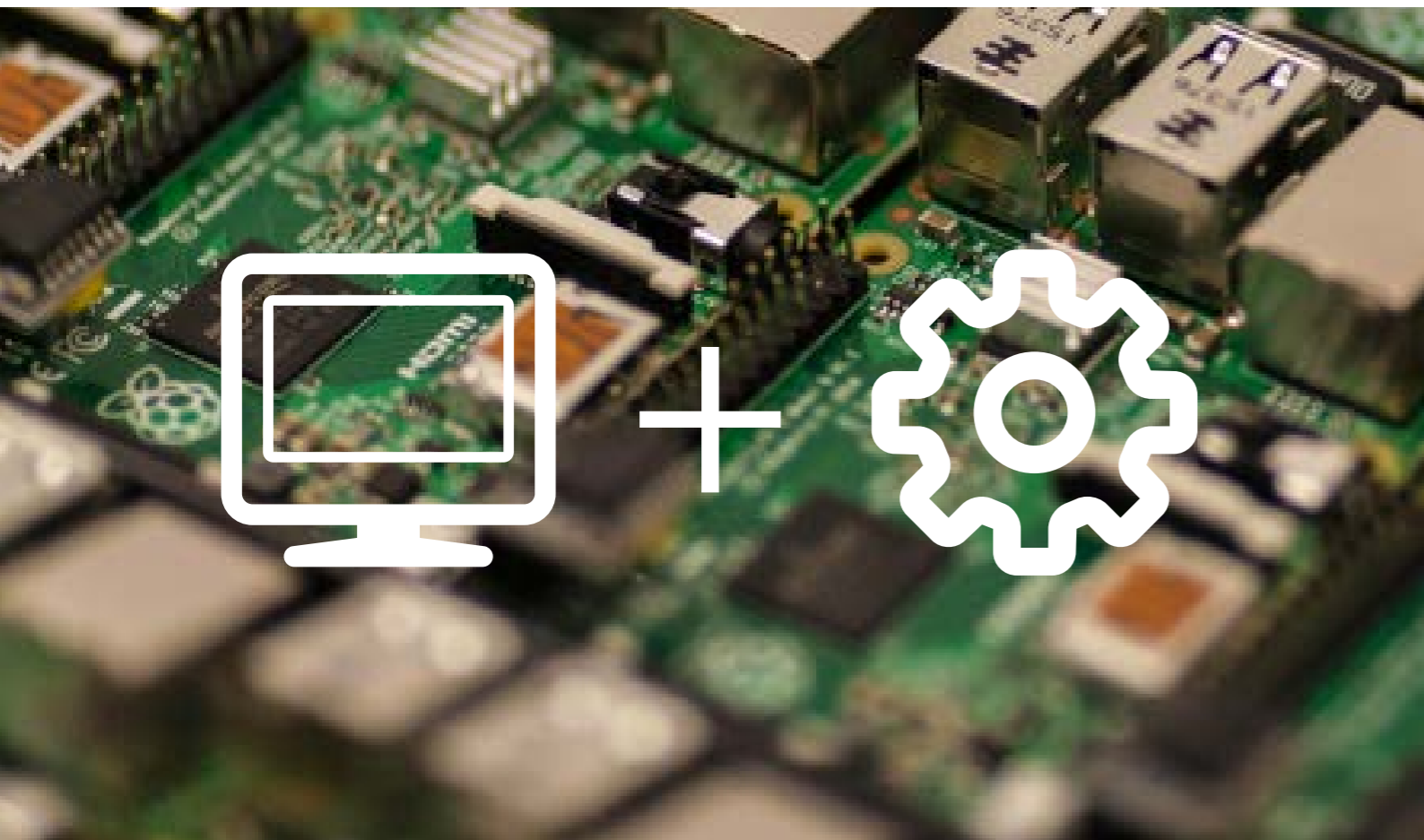
The hardware, or devices for measurement, includes all meters, concentrators, gauges, etc. that are installed in switchboards, gas meters or simply in the building itself to take measurements of energy consumption. There are also specific ones for monitoring other conditions that affect energy use such as humidity, temperature, etc.

Software is the tool that collects all of this data and presents it to you so that you can analyse and understand it and thus make decisions. At ISO 50001 standard, it is taken as given that your software should facilitate the documentation process. Of course, it is very much recommended for your software to incorporate measurement and verification tools. This function helps demonstrate the savings generated by the energy plan.
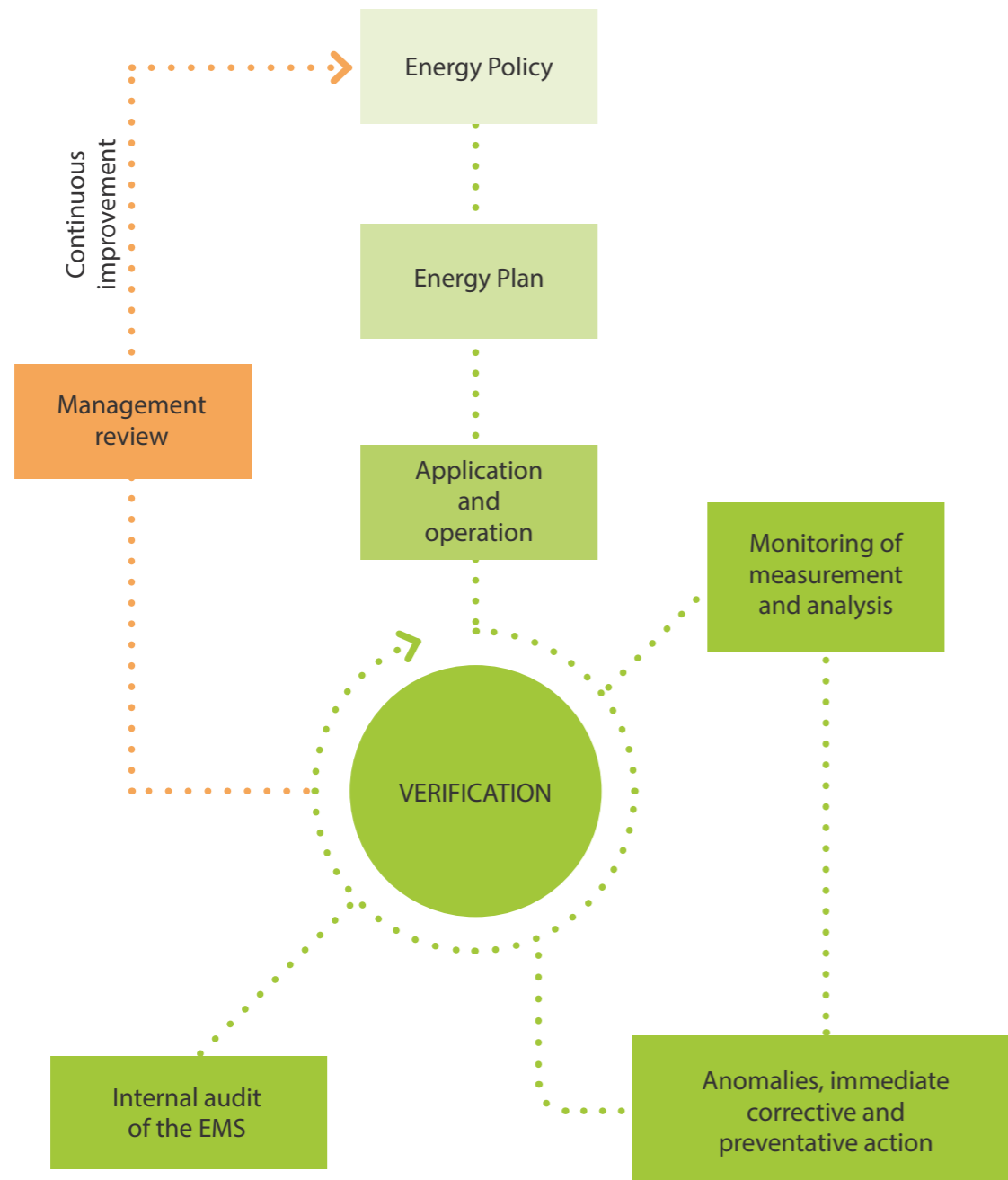
5 keys to remember when choosing your Energy Analysis Technology:

1. **STRAIGHTFORWARD INSTALLATION:** Being able to rely on meters that can be configured in less than 5 minutes, and an online platform, will help you analyze your energy consumption more quickly.

2. **SCALABLE FUNCTIONALITY:** Ideally, choose a technology that both covers your current basic needs, but also offers more advanced tools. In this way, you can fulfil the commitment to continuous progress promoted by ISO 50001.

3. **EASY TO USE AND HIGHLY VISUAL:** Undoubtedly your day-to-day affairs are complicated enough as it is without the additional strain of having to learn how to use new technological platforms. Indeed, the world of energy is sufficiently complicated in and of itself. What can you do in this situation? In this case we would always recommend that you see your platform for yourself before buying it (for example, through a DEMO account). What should you look for as you test a platform? You should ensure that the technology that you have in front of you is easy to learn and proactive in regards to the user. A glance should be sufficient to understand what you are seeing.

4. **POSSIBILITIES FOR COLLABORATION:** ISO 50001 promotes the implication of the entire company, and especially the management, in the energy plan. Your technology should help you to achieve this, for example by offering the option of creating dashboards for each role within the company.

5. **ISO 50001 CUSTOMIZABLE REPORTS:** Before taking the plunge, ask if you will be able to create personalized reports that are 100% adaptable to your business and adaptable to ISO 50001. These reports will help you with the documentation process and above all in subsequent audits and when renewing the certificate.

HOW DO I IMPLEMENT ISO 50001?

REGULATION ISO 50001 OUTLINES STEPS WITHIN THE OVERALL PROCESS, PROPOSING A MODEL FOR AN ENERGY MANAGEMENT SYSTEM:

Continuous improvement

Energy Policy

Energy Plan

Management review

Application and operation

Monitoring of measurement and analysis

VERIFICATION

Internal audit of the EMS

Anomalies, immediate corrective and preventative action

When implemented, you will see that ISO 50001 places great emphasis on highlighting what is a process and what is ongoing.

Therefore, it not only deals with 'actions' to carry out, such as speedy reforms, but rather with entire processes that will have to be put in place, which your organization may not already have.

In order to access the complete requirements of this EMS, the ISO has made available the complete text of the regulation (which must be purchased through the organization's website).

On a global level, we recommend you apply these six pieces of advice for success:

1. **INVOLVE THE WHOLE TEAM:** ISO 50001 insists that the company must be convinced of, committed to, and supportive of the energy management plan. But it is also important to involve all staff that may have an impact upon the energy plan. The channels of communication must be kept open throughout the entire process.

2. **CARRY OUT A STRONG INITIAL ANALYSIS:** It is advisable to carry out an initial audit that draws on previous internal work: it is important to identify how the organization works in relation to energy.

3. **COMPLY WITH LEGISLATION:** As you begin to implement an Energy Management System it is important to check if the Company is affected by any environmental or energy-related legislation, or if your home country or community have legislated in detail which certifications are acceptable demonstrations of compliance. For information we recommend that you visit the OFGEM authority web page (for UK) or the web page created by U.S. Energy Information Administration. Both are valuable official sources of information on legislation and energy regulation.

4. **BE SURE OF HAVING SUFFICIENT MEANS:** There is little point in beginning the implementation of ISO 50001 if professionals cannot be provided with the appropriate means for managing a system and maintaining its performance.

5. **RECRUIT AND MOTIVATE THE RIGHT TALENT:** The Company must be able to rely on specific figureheads who understand the keys to energy efficiency. If you choose to work with external consultants, choose those who specialize in energy management.

6. **REVIEW THE SYSTEM AND THE PROCESSES INVOLVED:** This is an indispensable step in order to obtain ISO 50001 certification. External reviews will follow, but it is also essential to put in place internal quality control and monitoring processes.

Installing the Technology

There are hundreds of energy monitoring technologies on the market, but far fewer that offer the capacity to analyze consumption and to control the full cycle of the Energy Management System as the ISO 50001 model requires.

Depending on which one you choose, the installation could be smooth and simple or else a string of setbacks.

At DEXMA, we are committed to developing a complete platform (from monitoring to control) in the cloud precisely for this reason: to ensure that technology is not an obstacle.

Monitoring technology- the hardware- may be installed during the first week of work in the building. Bigger projects will perhaps require a few more days.

The installation of the analysis and control platform, in the case of DEXCell Energy Manager, takes no time at all. There is no need to install anything in your computers. We simply create your account and you can begin configuring the meters and receiving instant data.

Thus the most common approach is to install the meters and immediately access the account, configure it and check that data is being received as it should. This can usually be done in a period of 48-72 hours.

What if you already have measuring equipment? DEXCell Energy Manager, for example, is neutral in terms of hardware, therefore you can feel secure that your measurements will be integrated and you will receive data with the same rapidity.

And if you already have a tool for viewing data, but want to change it? Data migration is no problem either, thanks to the elasticity of our solution. We have migrated data for large companies in less than 48 hours.

How long does it take to implement an Energy Management System (EMS)?

The timeframe depends on the characteristics of each organization. In general, it can very between 3 months and 1 year, in the case of larger or more complex companies.

However, when estimating your own case, think about the variables that can affect the timeframe of implementation, including:

+ The type of organization
+ The current state of your energy plan (if you have a monitoring system or not, whether or not you have carried out an audit in the past, even if it was only a partial audit…)
+ The complexity of your installations
+ The complexity of your production process (especially important in the industrial sector)
+ The resources that you are going to dedicate to implementation. Having one sole implementation manager is not the same as having a team of five people.

How Much Does this Technology Cost?

According to our experience, the most sensible approach is to invest the equivalent sum to your monthly bill. That is to say, if your installation consumes an average of €30.000 a month, this is your estimate for the cost of energy management.

Why? If we paint a 'pessimistic' picture in which you only save 8.5% a year, you will already have a 1 year ROI (the month that you save of the whole year is approximately 8.55%).

Normally the cost is split into 60% hardware and installation, 30% external services and 10% analysis software.

However…it is pretty nice to think that from the second year onwards you will only have to keep paying for the external services and the software, as a result of which the cost is practically marginal when compared to the savings achieved.

Thus the technology, perhaps surprisingly, is the least significant of the costs involved in implementing ISO 50001. More significant costs will be the initial audit, if one is carried out (it is advisable) and those of the certification body (which we will talk about at the end of this guide).

HOW DO I IMPLEMENT ISO 50001? A PRACTICAL EXAMPLE

In this section we want to present a practical example, based on the real case of one of our clients. The following is a real Energy Management System ISO 50001 certification process.

Due to their concerns over cost, the hotel has been preparing an energy plan for a few months now, but with the recent publication of the Royal Decree 56/2016 the hotel group has seen themselves obligated to fulfil this aim.

The headquarters have opted to fulfil this requirement through the implementation of an Energy Management System with ISO 50001 Certification in every hotel.

But our particular hotel has no kind of preparation in place for this. For this reason, it decides to carry out a preliminary energy audit and the result is a series of recommendations for energy retrofits:

Firstly, let's imagine a hotel…

+ Built 22 years ago
+ With 408 rooms
+ It is situated on the Spanish coastline, in an area with a warm climate
+ Its façade is brick and windows, with a terrace in each bedroom
+ The management is concerned about air conditioning, hot-water and lighting costs
+ They have a maintenance manager with some energy knowledge, but it is the aspect that the financial department is most concerned about for costs

+ It is necessary to improve the insulation of walls and roofs
+ Windows with thermal break are detected and must be replaced
+ The boilers can be replaced by new and more efficient models: condensation, low temperature, biomass…
+ In addition, thermic or photovoltaic solar energy ought to be installed to support the system
+ Lighting has remained antiquated for years. A more efficient LED system would help reduce consumption, as would automatic lighting
+ Freecooling and/or inverter air conditioning systems could be incorporated.

"Getting Regulation ISO50001 certification is a voluntary process, of course, but I would recommend any manager to take a step forward and implement it. It's a tool that allows us to systematically achieve and control the level of energy efficiency that we have established."

ISABEL BALSACH

Project & Energy Manager at Leading Pharma Company

There is a preliminary step to achieving the reforms. Does the hotel have energy analysis and management technology? No, in this instance the hotel did not have that technology available.

It is at this point when it would be even more interesting to install meters (if you do not have them already) and begin receiving the first set of data on an energy analysis platform, such as DEXCell Energy Manager.

Why is it important to do this at this stage? Without technology that can monitor, analyze and control energy correctly, it will be difficult to fulfil ISO 50001 standards because:

+ We will not have tools that can certify, in figures, the impact of the EMS.
+ We will not be able to determine a basic requirement of the ISO 50001: the calculation of the baseline energy consumption.
+ The hotel will not be able to fulfil another basic requirement of the ISO 50001: the establishment of a process of self-sustainability and cyclicality that will contribute to the continued improvement in energy usage of the organization. If you are not able to measure your energy consumption, it is difficult to determine how to reduce it, to highlight problems or inefficiencies, to identify areas where the hotel's energy policy is not being applied, etc.

Therefore in this case the hotel decided to improve their measurement system through the installation of new meters, connecting them with the DEXGate2 concentrator in order to send data to the internet and analyse it with DEXCell Energy Manager.

Thus, energy reforms were undertaken. With the measurements and subsequent analysis offered by the DEXCell Energy Manager, the hotel management and the Head of Environmental Maintenance have the necessary data and knowledge to make informed decisions.

"The implementation of an ISO 50001-approved Energy Management System allows you to develop and justify businesses' actions in energy efficiency."

ALEX CIURANA
Energy & Sustainability Director at PGI Group

Here we will outline:

1. The energy policy of the hotel
2. The reach of the policy, the reforms, etc.
3. The desired results…

We proceed with reforms, and this is the ideal moment to start the process of obtaining Energy Management System certification.

In the next section of our guide we will outline what exactly this process consists of: keep reading!

And of course, throughout the whole process, the hotel is documenting the work, in order to fulfil the requirements of ISO 50001…

CERTIFICATION

WHO EVALUATES WHETHER OR NOT I QUALIFY FOR CERTIFICATION FOR MY ENERGY MANAGEMENT SYSTEM?

When certifying your work, you will have to work with an accredited certification body.

Some the most well-known entities are:
+ TÜV Rheinland UK
+ BSI

How Will they Evaluate Me?

Normally the accredited certification bodies carry out two phases of evaluation (although the methodologies of these can change from one body to another, of course).

The first phase is an initial audit, in which the accreditation body with check:

1. That the implementation of the EMS has been correctly documented
2. That the scope of the system and its requirements (if relevant) have been correctly expressed and defined by the organisation
3. That the internal reviews and checks, orientated to continuous improvement, have been planned for and are being realized
4. Given the insistence of ISO 50001 that the energy management plan is an active strategy, understood and supported by the management of the company, the auditors can check the degree of internal understanding of the EMS.

The second phase consists of groundwork. The auditors will appear at the place in which the Energy Management Sytem has been implemented to check that it is functioning correctly and that it complies with ISO 50001 requirements.

From here, you will either receive certification for your system or else a report of non-compliance, with highlighted areas for improvement. In this last case, the company must present an action plan for the resolution of these problem areas.

How Much will it cost?

The cost of the certificate depends on the function of the organization.

Alex Ciurana, of PGI Group, a partner Company of DEXMA that has already implemented ISO 50001 approved Energy Management Systems, commented that, in his experience, "the cost varies between €2.500 to €4,000 per year."

If the auditing process includes more than one building, the cost increases in proportion with the number of buildings. Alex continues: "for each visit an auditor will usually cost around €600, and they can carry out a couple of visits a day."

How Much Time Will it Take for my Certification to Be Issued?

The timeframe for the issuing of the certification depends on the accreditation body.

However, there are some recommended timeframes that may not be exceeded. For example, no more than three months should pass between the execution of phases 1 and 2.

How Long is my ISO 50001 Certification Valid For?

Three years. After three years you will have to renew with the accreditation body you have chosen.

What happens during this time? It is usual to expect annual audits from the same body from which you have received your accreditation in order to monitor activity and guarantee the process of continued improvement is being carried out correctly.

How Can I Evaluate Compliance with ISO 50001?

The aforementioned accreditation bodies have the last word on whether or not a company has complied with the proposed methodology for ISO 50001.

After the first cycle, periodic checks will be made to ensure that ISO 50001 requirements are consistently being met.

Take care here to:

+ Correctly maintain and update your records
+ Review the EMS to ensure that everything is functioning as it should
+ Review changes in legislation or requirements that the company has promised to fulfil in its energy plan.

Failure to comply with ISO 50001 requirements can cause the loss of your certification, at least for the period of time that passes between the negative report from the accreditation body and the implementation of the necessary measures to resolve the highlighted problems.

No fine or penalty will ever be imposed, of course. Remember that at the start of this guide we commented upon the fact that ISO 50001 is not a law.

However, as we also mentioned in this guide, some businesses have begun to take an interest in the regulation because of legislative changes that affect them and oblige them to take action to improve their energy efficiency.

UK Government, for example, implemented the ESOS Regulations in 2014. This law is mandatory for any UK company that either employs 250 or more people, or has an annual turnover in excess of 50 million euro, and an annual balance sheet total in excess of 43 million euro. But also applies to overseas companies established in the UK with more than 250 workers in UK.

Companies affected must have an implemented EMS certified by ISO 50001 or pass an energy assestment.

If you enjoyed it...
share it!

Start Saving Energy
TODAY

+ Identify where you are consuming energy and which areas you can improve upon

+ Monitor your changes in real time

+ Control your efficiency plan and make good decisions

FREE DEMO

FREE Trial of DEXCell Energy Manager

SOURCES OF INFORMATION AND MORE LEARNING RESOURCES

Sources of information:

+ ESOS Regulation web page by UK Government

+ ISO, Win The Energy Challenge with ISO 50001, available here in PDF

+ AENOR, General Rules for Certification of Energy Management Systems, Spain, 2008.

+ Energy Efficiency Regulation in UK, Database by International Energy Agency.

+ Energy Efficiency Regulation in US, Database by International Energy Agency.

Recursos para aprender más:

+ Case Study: Radisson Blu Hotel in East Midlands Airport (free download)

+ SMART Goals in Energy Efficiency, Free Recorded Training

ISO Implementation Stats:

The ISO Survey

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ABOUT DEXMA

DEXMA provides an energy analysis platform to companies who need to measure, analyze, understand and reduce their energy consumption. The platform DEXCell Energy Manager is a powerful set of tools in the cloud with which companies can take informed decisions to reduce their energy consumption without affecting their productivity or business.

DEXMA was founded in 2007 in Barcelona and already works with more than 1,000 clients in 33 countries, having consolidated its expansion thanks to a comprehensive network of partners.

After over nine years of working in the energy sector, DEXMA is leading its own initiative for the sharing of knowledge about energy efficiency, to promote the best practices and to train professionals in energy usage. Consult our free learning resources here.

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