Fundamental

CURRENT THINKING ON...

Energy management standards

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After two years hard work by Prof. Martin Fry, chairman of the UK Mirror Committee, other experts, and the the BSI, the first international energy management standard, BS EN 16001, was born in September 2009. A number of countries already had successful systems and the best was taken from them to produce a universal approach.

An energy management system (EnMS) allows for systems and processes to be established to improve overall energy efficiency by introducing a continual improvement process. This involves creating energy monitoring plans as well as regular energy analysis activities. These can then be formalised into an organisational energy policy and listing of energy-related objectives, targets and future opportunities.

EiBI readers may wonder why yet another standard was considered necessary. However, this new standard provides fresh impetus to the whole process of reducing energy use and the resultant carbon emissions. There is already a high awareness of other standards, such as ISO 9001, ISO 14001 and OSHA 18001, and their success in focusing the mind on better management of organisational activities. However, none of the preceding standards, which cover a management system approach to quality, the environment, or health and safety, clearly defined the most appropriate management approach to the issue of the use of energy resources. As one of the pilot organisations noted – they had ISO14001 (Environmental Management Standard accreditation), and that already included energy as a defined controllable aspect. So why have a specific energy standard? However, on examination, they realised that the closest they got to energy specifics was the overall energy use per building. Trialling BS EN 16001 made them focus more on specific energy use applications, such as individual drive motor sizing, which eventually led to an additional 1.5 per cent total energy saving for the whole site, over and above those reductions already achieved on a building-by-building basis.

Structured approach

Standards are nothing more than a structured approach to a particular aspect of organisational management. They are not rules; they are guidelines which allow an organisation to set out a clear methodology for managing that aspect of its operations in a consistent manner. The whole approach is to find something that works effectively on a day-to-day basis and then to keep on doing it. The overall benefit for the organisation is a continuous flow of benefits. In addition, it learns as it goes to find even better ways of managing that particular organisational feature.

One of the key functions of any standard is the golden rule of continuous improvement. This suggests that through experience gained, and regular evaluation those procedures employed that work are identified, as are those procedures that do not.

From the beginning of 2011 the standards market confirmed that there are now over 100 organisations worldwide certified to BS EN 16001. However, no definition of a standard is set in tablets of stone – the standard will be updated based on feedback from end users. Its international ISO version (ISO50001) is in the very final stages of approval before being released in the middle of this year. There should then be a gradual transition from 16001 to 50001, subject to a final decision in Brussels in May. This is the same procedure as in past years for other standards in the quality and environmental fields: BS EN 5750 to ISO 9000 and BS EN 7750 to ISO 14001.

It is worth just assessing what the standard entails and how it was developed. It should be clearly noted that it is not a set of instructions on how to save energy or carbon. That is something that is individual to every organisation in terms of how they both use and manage energy-related resources. The concept behind BS EN 16001 is about establishing, implementing and then maintaining an effective management system. It is a set of procedures based on an energy policy which states the organisational targets, objectives and aspirations. As with other standards it is based on the PLAN – DO – CHECK – ACT process to enable organisations to develop continuous improvements in the area of activity being managed.

For details on how to obtain your **Energy Institute CPD Certificate**, see entry form and details **on page 32**

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Fundamental

Those who know and practise to ISO 9001 and 14001 will clearly recognise the structure of the standard and the methodologies required.

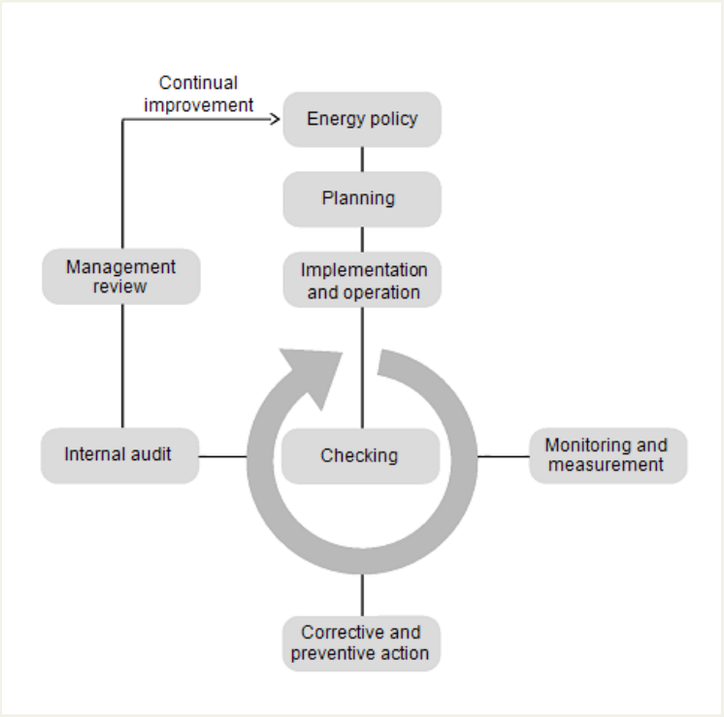
In conventional approaches to energy management there is a tendency to apply a degree of consideration to fiscal invoices to check they are correct and then possibly assess their relationship to the level of organisational activity. How often, and to what level of detail, this is done is another matter!

All organisations are constantly under pressure and the current world financial difficulties don't help. After all, energy may only be a relatively small percentage of total costs and the motivation to reduce consumption through occasional efficiencies may not always be high enough to achieve regular noticeable benefit or commitment from staff members at all levels. A management system provides focus and savings to add value to the bottom line.

The standard places useful constraints on an organisation, if they choose to implement the system, by regularising the processes that the organisation employs. It suggests that organisations have the following:

- clear policies in place;
- responsible persons identified;
- staff development and training provided;
- clear procedures identified for managing energy to reach targets and objectives;
- records of internal and external pressures (such as relevant legislation);
- records of progress;
- records of deviations in energy consumption from budgets and responses to those unexpected deviations; and
- periodic evaluations of the whole standardised system.

Initially this may sound slightly pedantic but the clear intent is to make sure that energy management is a regularised part of organisational activities and is therefore consistent in its approach. ISO 9001 and 14001 application have clearly demonstrated, over many years, that a consistent approach to various aspects of an organisation's approach will bring about considerable benefits. For example, with the levels of staff turnover that



can take place, it is useful to have a set of rules, approaches, procedures and/or guidelines available to continue the employment of proven effective processes.

One vital feature of any management system, and this is repeated in BS EN 16001, is the need for periodic system audits. This does not, however, refer to an energy audit, which focuses on how energy is used and opportunities for savings, but rather to a periodic assessment of the stated policies and procedures plus each and every feature of the organisation's approaches to managing energy. The purpose is to look for the strengths and weaknesses that may occur in the management system in terms of effective delivery of the expected outcomes. Once these have been identified the weakness can be assessed for potential improvements i.e. developing the in-house energy management processes to allow them to be even more effective.

Applying this standardised approach to the management of energy it is hoped that energy management will no longer be a knee-jerk reaction to circumstances prevailing such as a tariff increases but rather another aspect of effective businesses and organisations.

Define the scope

Implementation involves formalising the basic approaches to make energy management work.

Initially, the organisation must define the scope or coverage of the defined methodologies before starting to define a practical and current statement of policy. This will indicate the commitment of the organisation to all employees and other interested parties. That commitment being not only aspirational, in terms of targets, but also in the form of allocation of resources to energy management. These resources could be in the form of people, time, finance or other necessary items that facilitate successful energy management. Normally, unless specific conditions of confidentiality apply, the policy can then be released into the public domain in line with other demonstrations of intent. To validate the policy it must be signed by the most senior person at the site or the whole organisation and dated as a reminder that it will need updating (probably annually).

To start the process and provide substance and detail for the policy it is vital to carry out an initial review of the energy-related circumstances in the organisation. Part of this is an assessment and identification of the significant energy aspects and the prioritisation of opportunities for improvements. Most, if not all of this, may be based on past historical usage and application information.

Of course, all entities are subject to both internal operational rules and external legislation so it is vital to assess how these may impact on the overall energy performance and individual energy aspects. Updated records need to be maintained to check on how these match-changing circumstances.

From this assessment, plus gathering of facts and organisational and external requirements, an energy management programme can be established with identification of means and timeframe by which individual targets are to be achieved. All this is documented and updated at pre-determined intervals. This then results in a listing of organisational objectives and targets set for a defined duration.

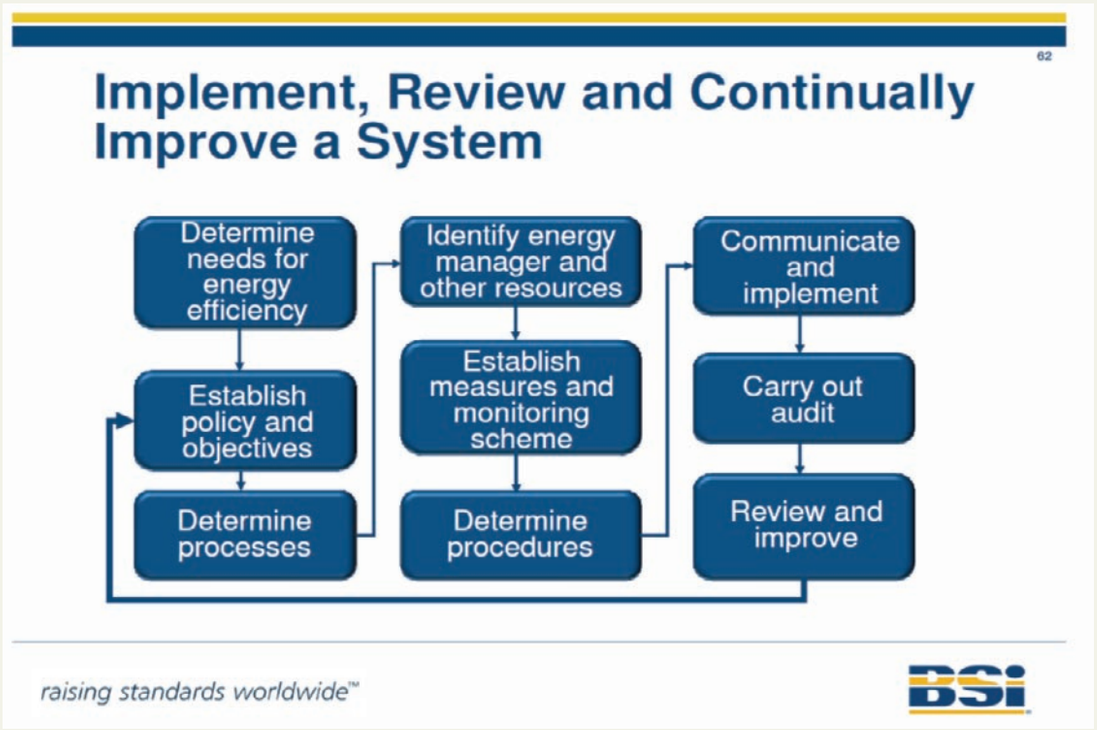
The organisation now knows what has to be done and can define roles and responsibilities and make sure that someone is responsible on a day-to-day basis to ensure success in achieving our objectives and targets. This can only be done if staff are aware of aims, they are suitably trained and competent.

The most important phase of the energy management activity is checking that it all works. The groundwork has been completed by auditing energy usage activities and assessing their effectiveness now it is imperative to monitor to assess and check that any improvement activities and procedures actually do create benefits. This is usually achieved through effective and sufficient metering which allows energy usage levels to be compared to their outcomes, namely the energy factors. This can be classed as creating a benchmark which then establishes a basis for future comparisons and budgeting. The organisation needs to know when it is consuming too much, or more than expected for a specific activity in a specified time.

Energy Management Standards

A fundamental step in any energy management activity is ascertaining the relationship between supply of energy and its application. Once that is understood it becomes easy to identify poor performance and potential energy waste.

As long as practices, needs and aspirations have been defined the organisation is in a position to decide if it is winning! A periodic management system audit will allow it to check each component of the EnMS to ascertain if there are any weaknesses or any potential for improvements. Any identified variations, positive or negative, are then reported back at intervals to a senior management review process so that they can be given due consideration. This may result in changes to the policy and amendment to the future plan. In this way it can complete the continual improvement loop which leads to an effective functioning energy management system. In addition, there are no worries if certain vital staff members move on to 'greener pastures' because the system is already defined and documented so any replacement can soon catch up and continue the success.



Self-assessment feature

One additional feature that differentiates the new energy management standard BS EN 16001 from other management system standards is the support now available for 'self assessment'. BSI and the Tenby Consultancy Group have developed an internet-based self-assessment tool that has two purposes. First, around 130 questions (based on the standard) allow organisations to carry out a thorough gap analysis of their ability to be compliant with the requirements of the standard via simple yes/no/partial responses. These responses are supported by both question/help text and implementation help text if required.

Second, this allows SMEs and other organisations to check that they are operating an energy management system within the spirit of BS EN 16001 such that they can not only self assess but also self accredit. This may be vital for organisations that only want to check that their management system is to a certain standard and are happy to self verify. At this point, or at some time in the future, the organisation can apply to an accreditation body for external verification of their compliance with the standard, if deemed necessary. It should not be too long before customers will be asking for reassurance that they are not paying for a supplier's wasteful practices involving energy use.

For those wishing to take on better management of energy within their organisation the solution is simple. Obtain a copy of BS EN 16001 from the British Standards Institute and start considering how it applies to your activities. Such is the perceived value of the standard that its main features have already been accepted as one of the early action metrics for the Carbon Reduction Commitment – EES programme. This BSI 'Kitemark' can then be extended to full certification as the organisation implements the fully defined approach. The kitemark's benefits are therefore not only short term but also long term as the organisation heads toward full BS EN 16001 compliance.

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ENERGY IN BUILDINGS & INDUSTRY

How to obtain CPD accreditation

Energy in Buildings and Industry and the Energy Institute are delighted to have teamed up to bring you this Continuing Professional Development initiative.

This is the final module in the eighth series and focuses on standards for energy management. It is accompanied by a set of multiple-choice questions. To qualify for a CPD certificate readers must submit at least eight of the ten sets of questions from this series of modules to ***Energy in Buildings and Industry*** for the Energy Institute to mark. Anyone achieving at least eight out of ten correct answers on eight separate articles qualifies for an Energy Institute CPD certificate. This can be obtained, on successful completion of the course and notification by the Energy Institute, for a fee of £15 (for members) or £25 (for non-members).

The articles, written by a qualified member of the Energy Institute, will appeal to those new to energy management and those with more experience of the subject. This new series of modules will run until the April 2011 issue.

The ninth series of CPD modules will begin in the May issue of EiBI. If you have missed any of the modules in this series please let EiBI know (mark.thrower@btinternet.com) and we will send you the missing modules in 'pdf' format to you either by e-mail or on a CD. The modules in the series focused on the CRC Energy Efficiency Commitment, insulation, heat pumps, training for energy management, district heating, fuel cells, smart meters, and photovoltaics, and LEDs.

The previous 70 modules from the first seven series are also available free of charge on CD.

MARK THROWER, MANAGING EDITOR

PLEASE COMPLETE YOUR DETAILS BELOW IN BLOCK CAPITALS

Name..... (Mr. Mrs, Ms).....

Business.....

Business Addres.....

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Post Code .....

email address.....

Tel No. .....

Completed answers should be mailed to:

The Education Department, Energy in Buildings & Industry, P. O. Box 825, GUILDFORD, GU4 8WQ

SERIES 8 MODULE 10: QUESTIONS

Energy Management Standards

Please mark your answers on the sheet below by placing a cross in the box next to the correct answer. Only mark one box for each question. You may find it helpful to mark the answers in pencil first before filling in the final answers in ink. Once you have completed the answer sheet in ink, return it to the address below. Photocopies are acceptable.

1. What is BS EN 16001?

- ☐ An Energy Management System Standard
- ☐ A Carbon management System Standard
- ☐ An extension of the ISO 14001 Standard
- ☐ A way of reducing energy wastage

2. What is meant by PDCA?

- ☐ Plan, Deliver, Check and Authorise
- ☐ Plan, Do, Check and Act
- ☐ Predict, Do, Check and Act
- ☐ Plan, Do, Correct and Act

3. What is an EnMS Audit?

- ☐ An Energy Audit
- ☐ A legislation update
- ☐ A Management System checklist
- ☐ A check for energy savings achieved

4. What does a non-conformance indicate?

- ☐ A EnMs failure
- ☐ A variation from the defined procedures and / or Policy
- ☐ An opportunity to improve the EnMS
- ☐ Identified Energy waste
- ☐ Excess energy costs

5. What is meant by self assessment / self certification?

- ☐ An internal confirmation that all components of an EnMS are to BS EN 16001 requirements
- ☐ The EnMs could be externally audited if so desired
- ☐ The EnMs is perfect and does not need to be developed further
- ☐ The organisation is effective at minimising energy use and costs

6. What is a BSI Energy Kitemark?

- ☐ A fully certified EnMS
- ☐ An 'early action metric' for the CRC
- ☐ An award for managing energy
- ☐ A sign of Quality

7. If the organisation does not achieve its objectives and targets in the defined period has it necessarily failed in its attempts to manage energy?

- ☐ Yes
- ☐ No

8. What is a significant Energy Aspect?

- ☐ Something that affects the use or level of use of energy supplies
- ☐ An energy meter
- ☐ A process
- ☐ An energy Policy component

9. What is Energy Efficiency?

- ☐ The ratio between energy input and output
- ☐ The amount of energy actually used
- ☐ The amount of energy used efficiently
- ☐ A measurable result of the effectiveness of an organisation's EnMs

10. What is an Energy Factor?

- ☐ The influence of the Energy Manager
- ☐ The actions of staff and personnel to reduce energy
- ☐ A driver that influences the level of energy consumed