



Danish Energy  
Agency

# Energy management and employee involvement

Experience and best practice from Danish businesses



## Be systematic in your energy management

### – and use the ISO50001 standard

Energy management is a management system involving technical optimisation as well as management of a business' energy optimisation work, etc. Energy management helps businesses identify focus areas and helps ensure short and long-term results. Energy management is therefore an essential component in energy saving efforts by Danish businesses. Experience shows that businesses that work with energy management achieve larger savings than businesses using a more traditional, solely technical approach.

#### Did you know that...

- Danish businesses completed more than 1,000 energy saving projects from 2010 to 2016 under the voluntary agreement scheme (energy and carbon taxes subsidies in return for energy efficiency improvements)?
- Energy efficiency improvements can improve the market position of a business?

### Energy management is the very foundation for energy saving efforts

There are several reasons why Danish businesses achieve greater savings with energy management. For example

- Management takes ownership and makes the necessary investments
- The business earmarks resources for the energy saving effort
- The business sticks to the effort year after year
- The effort is systematic and structured and is regularly evaluated
- Employees are involved across the entire business

- The business has more than one technical area of action
- A clear picture of the business' energy consumption and key indicators ensures insight and inspires action

### Capitalise on the energy efficiency experience of other businesses

Through voluntary energy efficiency agreements with the Danish Energy Agency, Danish businesses have implemented numerous energy saving projects and have performed analyses of energy intensive processes and supply facilities, etc.

The Danish Energy Agency has compiled the most important experience from businesses into a number of feature articles targeted at businesses with energy efficiency (and therefore energy saving) potentials.

This feature article presents some of the results of energy saving efforts and provides guidance on work with energy management.

#### CASE • Viking Malt

After 20 years of systematic work to optimise all aspects of its factory's energy consumption, Viking Malt A/S in Vordingborg, Zealand, has cut consumption by almost 40%.

**This has saved Viking Malt A/S more than DKK 15 million (EUR 2 million) annually on operating expenses.**

## Energy management not only saves you money

– there are *green* benefits as well

Above all, through a broad and systematic approach, energy management can identify your opportunities for saving energy across all relevant areas and situations in your business. Energy management therefore guides you to improve the efficiency of your largest and most energy intensive processes and facilities. However, it also helps you achieve many other benefits. Among other things, it gives you insight into capacity, quality parameters and key production indicators, which, in turn, can lead to savings and streamlined operation, production flow and logistics. In many situations, energy management can also free up capacity in processes and supply facilities and save investment costs when you expand.

### Did you know that...

- Energy management typically doubles your energy savings compared with a traditional, solely technology-based effort?
- Energy management often also improves your capacity, quality and logistics?
- Employees are motivated if they can help your business save energy?

This broad approach to energy initiatives can therefore help improve the quality of your production, improve your ability to meet your client's demands and increase job satisfaction among your employees.

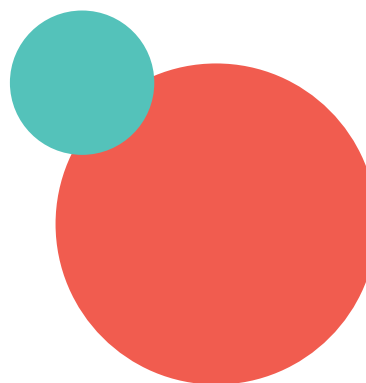
### Did you know that...

- Energy consumption by the Danish industrial sector has dropped by around 24 % over the last 20 years?
- More and more employees want to do something for the environment and climate - also at work?

## Energy efficiency is a competition parameter

When you optimise and improve your energy consumption, you immediately reduce your costs. Moreover, you become part of the green transition and help Denmark reduce its carbon footprint and strengthen its position as one of the most energy efficient countries in the world.

When you make optimal use of your energy resources, you also improve your competitiveness and prepare the ground for new business opportunities, increased exports and growth. This is good for Danish exports and it is good for your bottom line.



## **CASE • Trioplast changed the maintenance routines for its granulation knives. This increased capacity and reduced electricity consumption by 30 %.**



Trioplast manufactures plastic bags and industrial film. Trioplast is energy intensive and uses energy in many different processes. In order to save energy, Trioplast focused on energy efficiency in relation to maintenance.

As part of its ISO 50001 implementation, Trioplast established an energy management team that, in close collaboration with technicians and operators in the maintenance department, changed the procedure for replacing granulation knives. The knives used to be replaced once a year, but now they are changed every three months. The reason for the more frequent replacements is that energy consumption increases as the knives become less sharp.

In addition to energy savings, Trioplast also achieved product improvement and increased productivity.

### **The investment**

The costs of changing maintenance procedures were insignificant.

### **The result**

- Electricity consumption for granulation of plastic decreased by 30 % per tonne.
- The amount of discarded granulate halved and quality improved.
- Productivity increased by more than 20 %.

The changes made were based on experience, observations and suggestions from employees. Trioplast succeeded in establishing new, well-functioning procedures for operation, maintenance and monitoring of key energy indicators. They succeeded in this because the employees took ownership, and the employees took ownership because they had been involved in developing the new working procedures. By involving employees, Trioplast eliminated their resistance to change, and this paved the way for more and new energy saving initiatives.

## CASE • Fibertex Personal Care involved operators in energy work and ensured new focus on optimising process parameters.

Fibertex Personal Care produces textiles for hygiene products. The company uses considerable amounts of energy and wanted to reduce its consumption. Furthermore, many of Fibertex Personal Care's customers were demanding documentation for the company's energy saving efforts. Fibertex Personal Care therefore decided to implement the international energy management standard, ISO 50001.

This meant that many of the employees were involved in the energy saving efforts. For example, the operators were given a key role in work to revamp operations and cut energy consumption. In addition, efforts were formally organised and Fibertex Personal Care can now document results for employees and customers.



### The investment

Fibertex Personal Care already had quality and environmental standards in place, with routines and structures similar to those in ISO 50001. This meant that the investment was relatively modest.

### The result

- Improved position with customers due to the ISO 50001 certification.
- New process specifications.
- Establishment of a cross-disciplinary energy group to organise and manage efforts.
- More ideas and new knowledge as a result of broad employee involvement.
- Ongoing training and education of relevant employees.
- Annual energy savings of 2-3 %.

Energy consumption (kWh/tonne product) can vary by up to 5 % in the individual lines. The operators adjust the actual control and thus ensure the energy savings. In addition to the direct savings, Fibertex Personal Care expects that the operators will also contribute new ideas for future initiatives.

## How to save energy with energy management

- experience and *best practice* from other businesses

### Continuously involve relevant employees

Experience from other businesses shows that it makes good sense to identify which employees and departments mean the most for your energy efficiency and then include them in your efforts. For example, this could be:

- Your technical department responsible for security of supply and maintenance
- Your quality assurance department, which determines process parameters and product requirements
- Your production planning and sales departments, which plan your order processing
- Your LEAN department, which optimises the production run
- Your project department, which is responsible for procurement and for planning new facilities
- Your operators of central processes and facilities

It is a good idea to involve new employees in your energy efforts on an ongoing basis. This will help shed light on new areas for action and new savings potentials.

### Choose the right approach for your energy effort

You stand to gain the most if you organise your energy effort right from the start. You can do this by addressing these three topics first:

- 1. Organisation:** How broadly should you anchor your effort in the organisation and how can you achieve the greatest positive effect?
- 2. Employee involvement:** Consider whether to start with your technical staff and then include other departments and employees. Consider providing information about key indicators etc.
- 3. External experts:** Do you have the necessary competences and experience to implement your initiatives? External energy consultants can help you anchor your energy management system and prioritise your technical action areas.

#### CASE • Sun Chemical

Sun Chemical in Køge, Zealand, decided to anchor its energy management work in its LEAN/Six Sigma organisation.

This secured a broad focus on continuous energy efficiency improvements and on anchoring of the energy work in the production teams.



# How to get started

## – and achieve the best results

Use this approach to make sure you consider all relevant aspects of your systems and your needs. This will give you the best work process and the best results.

### Remember...

If you are covered by the EU requirements for energy audits every four years, you can instead opt to introduce a certified energy management system in accordance with ISO 50001.

This reduces your energy audit costs and secures a more continuous and broadly anchored energy effort.

### 1. Be broad in your approach to energy efficiency improvements

- What factors in addition to your technical facilities influence your energy consumption?
- For example, how do your production planning, maintenance, inactive periods and quality parameters affect your consumption?

### 2. Identify the best place to anchor efforts

- Should the energy management system be placed with a key technical employee or with your environment department?
- Or would it be beneficial to anchor the effort in a department with a lot of experience in implementing projects across the organisation, e.g. your LEAN department?

### 3. Begin with the technical aspects; end by setting targets

- What technical initiatives can give you specific savings and results from which you can prepare targets and manage your energy effort?
- How should the effort subsequently be anchored in management?

### 4. Integrate across your organisation

- Which initiatives can ensure subsequent implementation and anchoring of your energy management system across the entire organisation and not only in the technical departments?
- How can you involve your employees so that the energy saving efforts become routine for everyone?
- How do you ensure that new knowledge and new insights are used in other departments?

### 5. Choose the right key indicators

- Should energy efficiency developments be monitored and communicated at general level?
- Are there areas or facilities in which malfunctions or maloperation lead to energy efficiency losses?
- Are there key energy indicators or specific process parameters which must be monitored to prevent energy losses?
- Is there clarity about who monitors indicators and process parameters and how?

### 6. Accept the time horizon

- Your energy saving in the first year may only be 1-3 %.
- Over a longer period of time the accumulated saving will be much higher. Moreover, there will be derived benefits such as increased capacity, less maintenance, etc.

### Remember...

Energy consultants have extensive experience with energy efficiency improvements in Danish businesses. Energy consultants can help you plan your effort right from the start.

# Learn more

You will find six remaining feature articles in this series:

- **Evaporation, drying and distillation**
- **Ventilation and extraction systems**
- **Cooling, compressed air and vacuum systems**
- **Kilns and melting processes**
- **Evaporation, drying and distillation**
- **LEAN and productivity**

Furthermore the Danish Energy Agency have elaborated checklists (in Danish) for efficiency improvement initiatives, specification requirements for equipment, and analyses of efficiency potentials in the Danish Industry.

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