THE ORGANISATIONAL INTEGRATION OF ENERGY MANAGEMENT

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Abstract

The objectives of energy management are resource conservation, climate protection and cost savings, while the users have permanent access to the energy they need. Much of the importance of energy saving stems from the global need to save energy - this global need affects energy prices, emissions targets, and legislation.

Many companies are trying to promote its image and time protect the climate through a proactive and public energy strategy. In a divisional organization, there should be a central and several sector-specific energy management units. So the diverse needs of the individual sectors and the coordination between the branches and the head office can be fulfilled.

There are basically 4 steps to the energy management process and we will explore them in turn, before looking at the impact of energy management on information technology and the ethics behind such an approach.

Key words: energy management, greenIT, organizational management

JEL Classification : **F60, F61. F62, F63**

1. Introduction

In recent years, the implications of the term "energy management" have increased exponentially. From the point of view of saving energy in businesses, public-sector/government organizations, and homes, energy management is the process of monitoring, controlling, and conserving energy in a building or organization. Typically this involves the following steps:

1. Metering your energy consumption and collecting the data.
2. Finding opportunities to save energy, and estimating *how much* energy each opportunity could save.
3. Taking action to target the opportunities to save energy (i.e. tackling the routine waste and replacing or upgrading the inefficient equipment).
4. Tracking your progress by analyzing your meter data to see how well your energy-saving efforts have worked.

Consequently, the objectives of energy management are resource conservation, climate protection and cost savings, while the users have permanent access to the energy they need. In other words, energy management is the proactive, organized and systematic coordination of procurement, conversion, distribution and use of energy to meet the requirements, taking into account environmental and economic objectives". [1]

Energy management is the key to saving energy in the organization. Much of the importance of energy saving stems from the global need to save energy - this global need affects energy prices, emissions targets, and legislation, all of which lead to several compelling reasons why management should save energy in the organization.

That is why responsibilities and the interaction of the decision makers should be regularized. The delegation of functions and competencies extend from the top management to the executive worker. Furthermore, a comprehensive coordination can ensure the fulfillment of the tasks.

It is advisable to establish a separate organizational unit "energy management" in large or energy-intensive companies. This unit supports the senior management and keeps track. In case of a functional organization the unit should be located directly between the first (CEO) and the second hierarchical level (corporate functions such as production, procurement, marketing).

In a divisional organization, there should be a central and several sector-specific energy management units. So the diverse needs of the individual sectors and the coordination between the branches and the head office can be fulfilled. In a matrix organization the energy management can be included as a matrix function and thus approach most functions directly.

Looking at small and medium enterprises, energy management often is only a subtask of an executive. These organizations do not have the necessary capacity to fill a full-time position with corresponding responsibilities. Another option is outsourcing the energy-related issues and questions to an external service. This external service could contribute new knowledge and optimize processes based on its specialization. [2]

2. Organisational management of energy consumption

Energy management is the means to controlling and reducing an organization's energy consumption as it enables management to:

- **Reduce costs** – this is becoming increasingly important as energy costs rise.
- **Reduce carbon emissions** and the environmental damage that they cause - as well as the cost-related implications of carbon taxes and the like, your organization may be keen to reduce its carbon footprint to promote a green, sustainable image. Not least because promoting such an image is often good for the bottom line.
- **Reduce risk** – the more energy is consumed, the greater the risk that energy price increases or supply shortages could seriously affect profitability, or even make it impossible for the business/organization to continue. With energy management management can reduce this risk by *reducing* the demand for energy and by *controlling* it so as to make it more *predictable*.

Many companies are trying to promote its image and time protect the climate through a proactive and public energy strategy. For example, General Motors (GM) strategy is based on continuous improvement. Furthermore they have six principles: e.g. restoring and preserving the environment, reducing waste and pollutants, educating the public about environmental conservation, collaboration for the development of environmental laws and regulations.

Nokia's environmental efforts are based on four key issues: substance management, energy efficiency, recycling, promoting environmental sustainability. [3]

There are basically 4 steps to the energy management process:

1. Metering the energy consumption and collecting the data

The modern approach to energy-data collection is to fit interval-metering systems that automatically measure and record energy consumption at short, regular intervals such as every 15-minutes or half hour. T

Detailed interval energy consumption data makes it possible to see patterns of energy waste that it would be impossible to see otherwise.

2. Finding and quantifying opportunities to save energy

The easiest and most cost-effective energy-saving opportunities typically require little or no capital investment.

For example, an unbelievable number of buildings have advanced control systems that could, and should, be controlling HVAC well, but, unbeknown to the facilities-management staff, are faulty or misconfigured, and consequently committing such sins as heating or cooling an empty building every night and every weekend.

*(NB "HVAC" is just an industry acronym for **H**eating, **V**entilation and **A**ir Conditioning. It's a term that's more widely used in some countries than others.)*

And one of the simplest ways to save a significant amount of energy is to encourage staff to switch equipment off at the end of each working day.

Also, most buildings have open to them a variety of equipment- or building-fabric-related energy-saving opportunities, most of which require a more significant capital investment.

3. Targeting the opportunities to save energy

A good place to start is energy awareness. If an organization wants to save energy, it's important that the staff become aware of the energy consumption that they are responsible for. Simple changes in people's behaviour can quickly lead to significant energy savings, but such changes will only happen if the people are aware of the energy consumption that they have the power to control.

If managers can guide and encourage them appropriately, staff can probably achieve huge cuts in the organization's energy consumption. Everyone knows that saving energy is a good thing, but most people will only be motivated when one can demonstrate just how much energy they are wasting, and just how much potential there is for them to improve.

4. Tracking your progress at saving energy

Once actions have been taken to save energy, it's important that to find out how effective the actions have been:

- Energy savings that come from behavioural changes (e.g. getting people to switch off their computers before going home) need ongoing attention to ensure that they remain effective and achieve their maximum potential.
- If money have been invested into new equipment, the management wil want to *prove* that they've achieved the energy savings predicted.
- If faulty timers or control-equipment settings have been corrected, it's paramount to keep checking back to ensure that everything's still working as it should be. Simple things like a power cut can easily cause timers to revert back to factory settings.

3. Information technology and energy management

The center of an environmental and resource saving structure of information technology is Green IT.

In the article Harnessing Green IT: Principles and Practices, San Murugesan defines the field of green computing as "the study and practice of designing, manufacturing, using, and disposing of computers, servers, and associated subsystems—such as monitors, printers, storage devices, and networking and communications systems — efficiently and effectively with minimal or no impact on the environment." [4] This includes the optimization of resource consumption during manufacturing, operation and disposing of computers. With the help of IT, work processes can be eliminated or improved energetically.

Approaches:
- Production of devices: You should make sure that the equipment was manufactured resource-conserving and consume less power than comparable devices.
- Purchase and operation of equipment: Energy Staris an international standard for energy efficient consumer products originated in the United States of America. The Energy Star label can help to identify energy efficient devices. Important elements are for example more efficient power adapter, a modern stand-by and sleep mode.
- IT support: Many programs support organizations to conserve energy. This includes large ERP systems as well as the IT support of small systems. There are also commercial energy management systems.

Apart from technology causing some environmental issues, it is also one of the best tools we have available to the human race to help us understand how we can fix environmental issues.

For example, technology can help us achieve things such as climate change modelling. Climate change modelling requires massive computer processing capability. Super-fast computers are sitting in labs across the world calculating scenarios for our future – how much will the sea rise? Which countries would be wiped out? How long will it take?

Another example of technology helping to solve environmental issues is carbon sequestration. But what is carbon sequestration? Well without getting into a science class discussion, it's really about storing excess carbon. At the moment you probably know that trees store carbon but we simply don't have enough trees to store all the carbon we produce. So we need to look for other places to store carbon. There are numerous proposals from scientists on how we do this, including storing it underground or in the sea. However before we go drilling places around the world and disturbing the flora and fauna, computers can help identify suitable storage areas – without the unnecessary drilling.

Going to be green is not an easy task, for every company, to adopt. It involves huge investments of money and other resources, which are used in research, development and implementation of new green processes and products. Nevertheless, all the investments will pay-off on the long time term, with benefits for both companies and customers, and will produce a lower environmental footprint. The Green IT practices used by both companies have covered the optimization of IT framework which reduce the energy consumption and amplify the disposal of electronic waste. Based on the data from the CSR reports, we can say that both companies follow the Green IT principles and are involved in researches of new ways to implement these principles into practice. This practice follows some international standards which involve several important environment actions such as reducing of the hazardous material used and finding new substitute materials, minimizing the energy and water consumption and decreasing of GHG emission. From the customer point of view, the consequences from purchasing green products are various. the customer benefits from the surrounding environmental conditions, since the computer manufacturing companies are producing products with a low impact in various environmental areas (e.g. greenhouse gas emissions, polluted water, hazardous waste, etc.

4. Conclusions

The basis of every energy strategy is the corporate culture and the related ethical standards applying in the company. [5] As we have seen above, energy management is not only profit oriented but it is also a way of answering pressing global issues and applying ethical standards within the organization. These standards can appear in company guidelines, energy and environmental policies or other documents.

The most relevant ethical ideas for the energy management are:
- Utilitarianism: In terms of energy management, the existence of external costs should be considered. They do not directly affect those who profit from the economic activity but non-participants like future generations. This error in the market mechanism can be solved by the internalization of external costs.
- Argumentation Ethics: This fundamental ethical idea says that everyone who is affected by the decision, must be involved in decision making. This is done in a fair dialogue, the result is completely uncertain.

- Deontological ethics: The deontological ethics assigns individuals and organizations certain obligations. A general example is the golden rule: "One should treat others as one would like others to treat oneself." Therefore everyone should manage their duties and make an energy economic contribution.

5. References

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