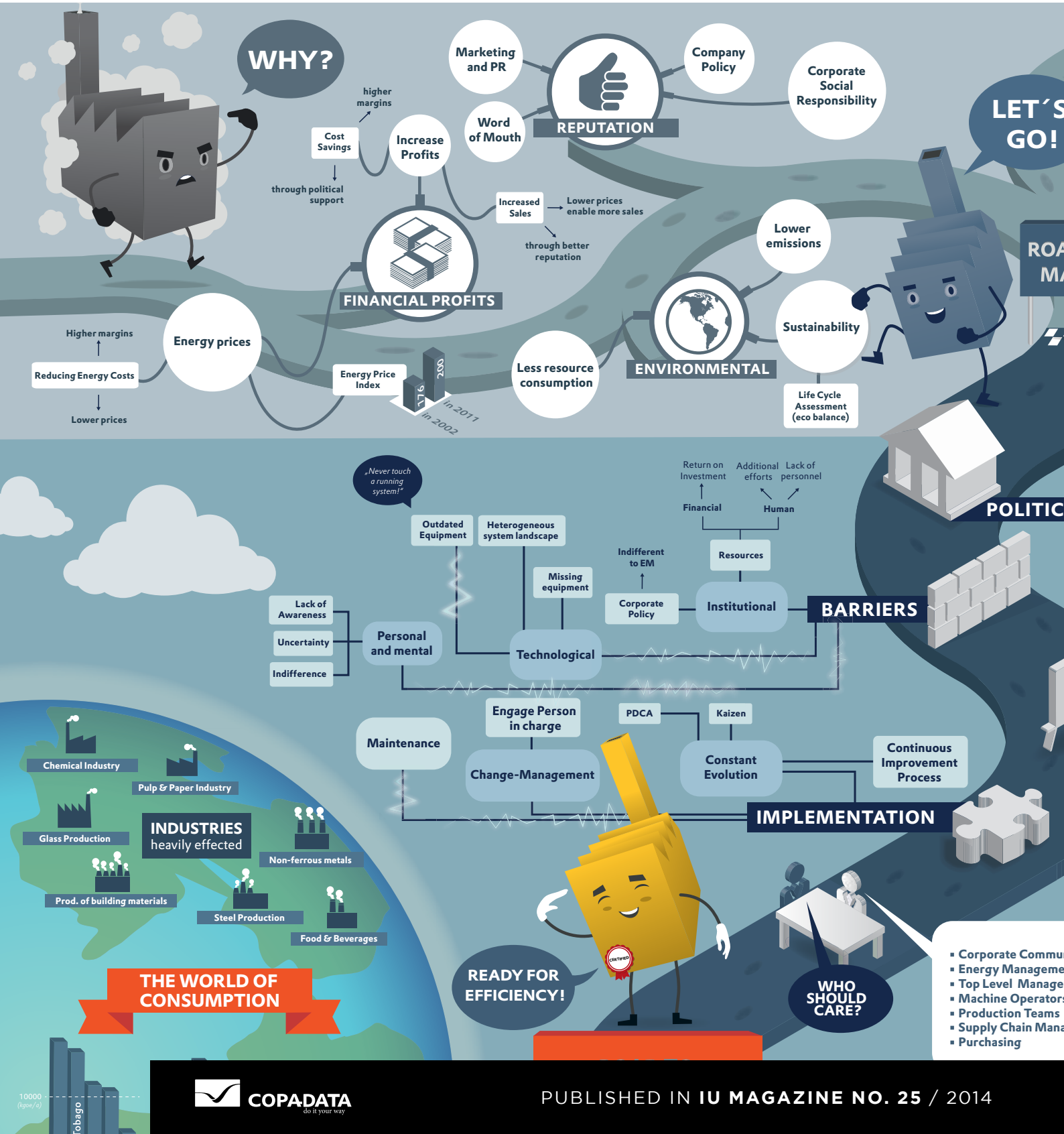
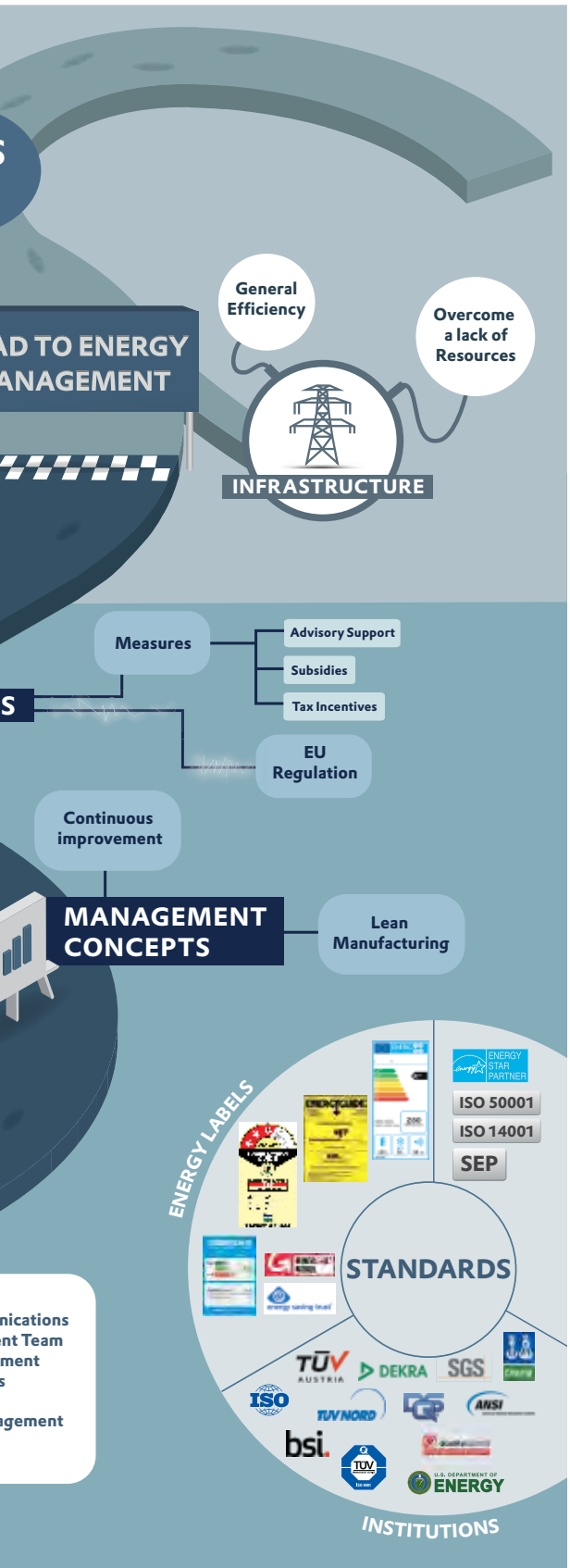

WHY?
Marketing and PR
Company Policy
Corporate Social Responsibility
Word of Mouth
REPUTATION
LET´S GO!
higher margins
Cost Savings
through political support
Increase Profits
Increased Sales
Lower prices enable more sales
through better reputation
FINANCIAL PROFITS
Lower emissions
Higher margins
Energy prices
Reducing Energy Costs
Lower prices
Energy Price Index
176
200
in 2002
in 2011
Less resource consumption
ENVIRONMENTAL
Sustainability
Life Cycle Assessment (eco balance)
„Never touch a running system!"
Return on Investment
Additional efforts
Lack of personnel
Financial
Human
Outdated Equipment
Heterogeneous system landscape
Indifferent to EM
Resources
Missing equipment
Corporate Policy
Institutional
BARRIERS
Lack of Awareness
Uncertainty
Indifference
Personal and mental
Technological
Engage Person in charge
PDCA
Kaizen
Maintenance
Change-Management
Constant Evolution
Continuous Improvement Process
IMPLEMENTATION
Chemical Industry
Pulp & Paper Industry
Glass Production
INDUSTRIES heavily effected
Non-ferrous metals
Prod. of building materials
Steel Production
Food & Beverages
THE WORLD OF CONSUMPTION
READY FOR EFFICIENCY!
WHO SHOULD CARE?
Corporate Commu
Energy Manageme
Top Level Manage
Machine Operators
Production Teams
Supply Chain Mana
Purchasing
10000
(kgoe/a)
Tobago



SPOTLIGHT

ENERGY MANAGEMENT

ENERGY MANAGEMENT AS A DECISIVE COMPETITIVE FACTOR?

In the search for adjustments to make in order to improve operating margins in industrial manufacturing, one topic is increasingly coming into focus: energy costs. In particular, in countries with high energy prices such as Germany, Italy or Great Britain, there is a need to optimize the energy budget. Experts predict that the ability to produce in an energy-efficient manner, will also have a decisive effect on future national and international competitiveness.

ENERGY MANAGEMENT is increasingly playing a decisive role in international competition. Especially in Europe, energy is a particularly valuable resource. Consequently, the EU sees effective energy management as an important key in securing competitiveness and optimizing the use of resources. The member states are required to promote and develop active energy management.

European companies must therefore devote more focus on energy management. This is also reflected in an international snapshot: Europe is well ahead in the issue of energy management followed by Asia, a large distance behind (see *Figures 1* and *2*). Energy management is, of course, not an undisputed issue in Europe. Some fear that it is a brake rather than a boost due to many government regulations. However, experience shows that new technologies and software for energy optimization contribute decisively to the profitability of many companies – the more energy intensive, the more noticeable.

Europe	2212	81,87 %
Asia	408	15,10 %
North- and Central America	48	1,78 %
South America	25	0,93 %
Africa	7	0,26 %
Australia	2	0,07 %
Global	**2702**	**100,00 %**

ISO 50001 certifications worldwide

Figure 1: Number of ISO 50001 certifications of companies around the world (as of: 12/31/2013). Based on the source: Principles of Environmental Protection Standards Comittee (NAGUS). DIN Deutsches Insitut für Normung e.V. [German Institute for Standardization] http://www.nagus.din.de. Note: one certification per company was taken into account, not the certification of individual sites of the same company.

MANAGEMENT MAKES ENERGY MORE VALUABLE

Fossil fuel sources are becoming increasingly scarce and alternatives from wind to solar energy are not yet in a position to act as primary substitutes causing, among other things, rising energy prices. At the same time, environmental policy requirements are becoming stricter and stricter. Companies are increasingly under pressure to improve their energy efficiency, to reduce energy consumption and to have a keen eye on their CO_2 emissions.

The fact that it is generally European companies which dedicate most attention to the topic of energy management certainly has something to do with state requirements and incentives, but sometimes is also due to cultural roots. Energy as a valuable resource entered public consciousness in the seventies. Many managers recognize the economic potential of targeted energy management – and are happy to accept the associated positive recognition from society. However, there is still a large gap between recognition and implementation in Europe and around the world.

In a survey carried out by Economist magazine in 2010[1] 80 % of the respondents agreed with the statement that more efficient use of energy is becoming increasingly important. However, only half believed that companies also incorporated this into their corporate strategy sufficiently.

Consistent energy management offers a range of significant benefits:

PERFORMANCE IN THE WIDER ECONOMY

The implementation of an energy management system (EMS) improves energy efficiency. Energy costs are reduced, the dependency on energy prices is diminished and competitiveness increases. In addition, subsidies and other competitive advantages can be gained in many countries through documented energy management.

REDUCTION OF COSTS

The prices for energy and natural resources are continually increasing. Using scarce resources efficiently and reducing energy consumption is a basic method for manufacturing companies to reduce costs.

ECOLOGY

One of the objectives of energy management is the reduction of environmental damage. For companies, this means not just acting with social responsibility and investing in their social reputation. Increasing environmental damage also increases the spending of companies on preventative measures, compensation, emissions certificates and insurance. A careful eye on the environment has an effect on costs at the same time.

CORPORATE SOCIAL RESPONSIBILITY (CSR)

Climate change and the scarcity of resources are hot issues currently. Appropriate commitment increases the positive perception of a company in the public eye.

The consulting company Bain & Company assumes that a typical European or US company can save between 10 % and 30 % of direct energy costs within three years. The savings in indirect costs, from low maintenance, reduced material and waste costs through to reduced risk, are estimated to be up to 50 %[2].

ISO 50001: CLEAR OBJECTIVES, NEW METHODS

There can be many forms of energy management. Standards can help to describe these methods effectively and efficiently. With EN 16001, Europe already had a standard that formed the basis of ISO 50001 for EMS, a standard that is characterized by many benefits. It is not just modern, but most of all is highly compatible with other environmental and quality standards from EN 16001 to the energy management standard ISO 14001 as well as the European Eco Management standard and Audit Scheme (EMAS). This

[1] Source: http://www.bain.com/publications/articles/hidden-treasure-why-energy-efficiency-deserves-a-second-look.aspx

[2] Source: http://www.bain.com/publications/articles/hidden-treasure-why-energy-efficiency-deserves-a-second-look.aspx

standards framework provides an effective benefit for companies:

For anyone who wants to implement energy management to these standards, the route to ISO 50001 might be too short. However, the standard serves not solely to create an energy management system; it can also serve to certify systems which comply with the norm.

ISO 50001 was published in June 2011 by the International Organization for Standardization (ISO). The introduction of an EMS is voluntary and there is also no obligation to obtain certification. However, many countries offer tax benefits and other economic and financial incentives to companies that can show corresponding certification. In Germany, for example, certification is one of the requirements for the partial exemption of particularly energy-intensive companies from their allocation in the German Renewable Energies Act. Since 2013, companies who wish to apply for a surplus settlement must also prove their increased energy efficiency with the help of certification[3].

The new energy management standard is, however, markedly different to its predecessors in some aspects. It primarily relates to energy performance only, whereas ISO 14001 is aimed at the complete environmental performance. ISO 50001 is limited to a clearly-defined area. This makes it more accessible and allows it to be implemented into actual, verifiable action. For example, it prescribes that the energy-related starting basis be defined.

The recent standard brings an impetus into the handling of energy. In order to meet it, it is virtually impossible to avoid a well-developed energy data management system (EDMS). This is because much data must be collected, administered and made usable for targeted planning. At the same time, plans and procedures must be verifiable. There are already large amounts of data in SMEs and it is not all accessible at the click of a mouse. The larger the company, the more complex the task. Excel lists can provide data in a structured and targeted form, but do not help in overcoming any issues.

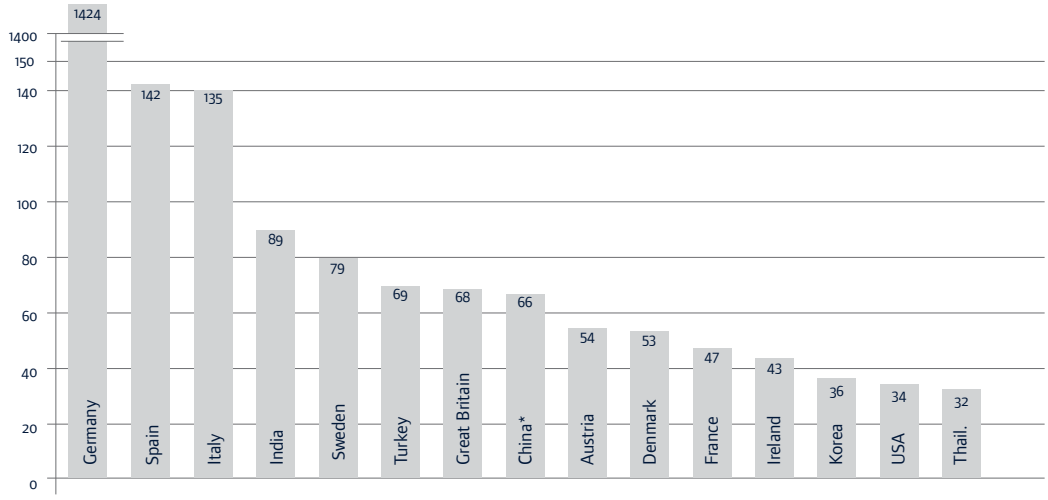
All in all, ISO 50001 offers good support for the improvement of energy efficiency, which is defined by the EU as follows: "the ratio of output of performance, service, goods or energy, to input of energy."[4] And it is just a small step for anyone who has already implemented other compatible standards.

EU INTEREST – THE DRIVER OF PROFESSIONAL ENERGY MANAGEMENT

The EU has set ambitious energy efficiency targets. In 2007, a decision was made to save 20 % in the consumption of primary energy as compared to the projection by 2020. This is a target that has not currently been sufficiently implemented. This situation has given rise to the "Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency". In this, the following is written in CHAPTER I, Article 1:

SUBJECT MATTER AND SCOPE

(1) "This Directive establishes a common framework of measures for the promotion of energy efficiency within the Union in order to ensure the achievement of the Union's 2020 20 % headline target on energy efficiency and to pave the way for further energy efficiency improvements beyond that date. It lays down rules designed to remove barriers in the energy market and overcome market failures that impede efficiency in the supply and use of energy, and provides for the establishment of indicative national energy efficiency targets for 2020."



Top 15 countries for ISO 50001 certifications

Figure 2: the top 15 countries for ISO 50001 certifications (as of: 12/31/2013). Evaluated and shown as a graphic on the basis of the source: Principles of Environmental Protection Standards Comittee (NAGUS). DIN Deutsches Insitut für Normung e.V. [German Institute for Standardization] http://www.nagus.din.de. Note: one certification per company was taken into account, not the certification of individual sites of the same company

[3] Source: http://www.qz-online.de/news/uebersicht/nachrichten/iso-survey-mehr-zertifizierungen-von-managementsystemen-723591.html

[4] Source: Official Journal of the European Union from 11/14/2012, p. 10, Article 2/4 in Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC.

The EU envisages not just large companies as being under obligation, it is also targeting SMEs, which are to be supported accordingly by the member states of the EU. The following is written in the preamble, in Item 24:
"To tap the energy savings potential in certain market segments where energy audits are generally not offered commercially (such as small and medium-sized enterprises [SMEs]), Member States should develop programmes to encourage SMEs to undergo energy audits. Energy audits should be mandatory and regular for large enterprises, as energy savings can be significant."

Article 3 defines the energy efficiency objectives that each state has set out and shall communicate to the Commission. High-quality energy audits are required to support this. Large companies are to be obliged to be audited by qualified experts by December 5, 2015 and at least every four years after the previous energy audit.

The EU has, due to its self-imposed energy saving objectives, great interest in member states and their companies improving their energy balance. Implementation in individual member states is different, but offers companies many opportunities to benefit from state support.

THE OBJECTIVE: CONTINUOUS IMPROVEMENT

ISO 50001 revisits the idea of continuous improvement and applies it in a very structured manner to energy management in companies. Four constantly-repeating steps will limit the consumption of resources and expensive waste of energy. This procedure is known as the PDCA process. P for Plan, D for Do, C for Check and A for Act.

First, there is the plan. In the first stage, the current energy status of the company is established and outlined. The primary objective is to identify those company areas that consume particularly large amounts of energy or cause high costs. It is precisely this phase that needs much care because all subsequent plans and actions are based on this data. A company's preconceived notions about its own consumption and any whitewashing would later develop into major hurdles.

In the second stage, Do, the orientation is actually focused on the future. Only now are objectives defined, then measures are developed and implemented straightaway.

Verification follows with stage three, Check. Have all the actions from Phase Two been successful? Data is collected again and compared to the planned targets. The result leads to more action in the fourth stage. The reports from the Check Phase become the basis for further improvements – and the cycle starts again.

The process of continuous improvement works in practice, but only with a system that can collect the necessary data, compress and prepare it and, ideally, also actively help with the implementation, for example, by making controlling interventions.

THE BASIS: A WELL-DEVELOPED ENERGY DATA MANAGEMENT SYSTEM

Systematic energy management has an indispensable basis: the recording of all energy flows and consumption in the company. It is therefore essential that an energy data management system can collect data from many sources and administer this.

However, it must also ensure that different sources can be compared, and that different data can be reliably integrated into a measurement system. In addition to this there are further tasks, such as the creation and output of reports and much more. However, the basic step is already a massive task for many companies. Ultimately, the desired data is usually not located at one central point from which it simply needs to be accessed. Not all energy consumers can be automated remotely and queried in a way that is useful to an electronic system. And, even if this is the case, there are often different protocol languages.

Effective implementation of energy management requires a large amount of commitment and know-how. This is not simply done with collection alone. The data must be condensed and evaluated. And somebody must also reach the correct conclusions from it and develop appropriate plans – and implement them.

Professional systems are used for this. COPA-DATA customers already know that zenon is very suitable as an EDMS, especially in conjunction with the reporting software zenon Analyzer. This combination offers particular advantages most of all in the Check phase. However, this is not the focus of this article. In this *IU,* you can find further indepth articles about the topic of energy management and which are illuminating from a practical standpoint.

There is a full range of EDMS on the market. The first decision is a particularly important one: selection of the appropriate system. The success of the planned energy management is already decided here. When making the selection, it should not be just the individual functions that are in the foreground, but how the complete system meets the special requirements of the company. Not every operation requires the same support.

No less important is the professional and careful implementation of an energy data management system. It must be ensured that only valid data is collected and used as the basis for action plans. It is important to dedicate enough time and expertise for this. If the system has been set up once, subsequent expense for regular audits and adjustments is greatly reduced.

ENERGY MANAGEMENT AS A COMPETITIVE ADVANTAGE?

Energy management has only been in focus in the recent past. The topic has nevertheless had much influence. The fact that countries outside Europe still only have a comparatively low number of ISO 50001 certifications is hardly

a sign of a lack of international significance. It simply takes time until active energy management advances worldwide. The first steps have already been made in the USA too, and Asian countries – most of all India – have long recognized the benefits of energy-efficient production *(see Figure 2)*.

The readiness of European countries to support energy management with subsidies can also be seen by international companies based in the EU as timely support to prepare themselves for the energy issues that will be a decisive factor for competitiveness in the next years and decades.

AN OVERVIEW OF IMPORTANT FIGURES

Number of ISO 50001 certifications	12/31/2012	12/31/2013	Relative growth
worldwide	1003	2702	+ 169 %
Germany	479	1424	+ 197 %
Spain	46	142	+ 209 %
Italy	55	135	+ 145 %
India	37	89	+ 141 %

Number of German companies as a percentage of the overall figure 52,70 % (12/31/2013)

RECOMMENDED READING:

Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC.