

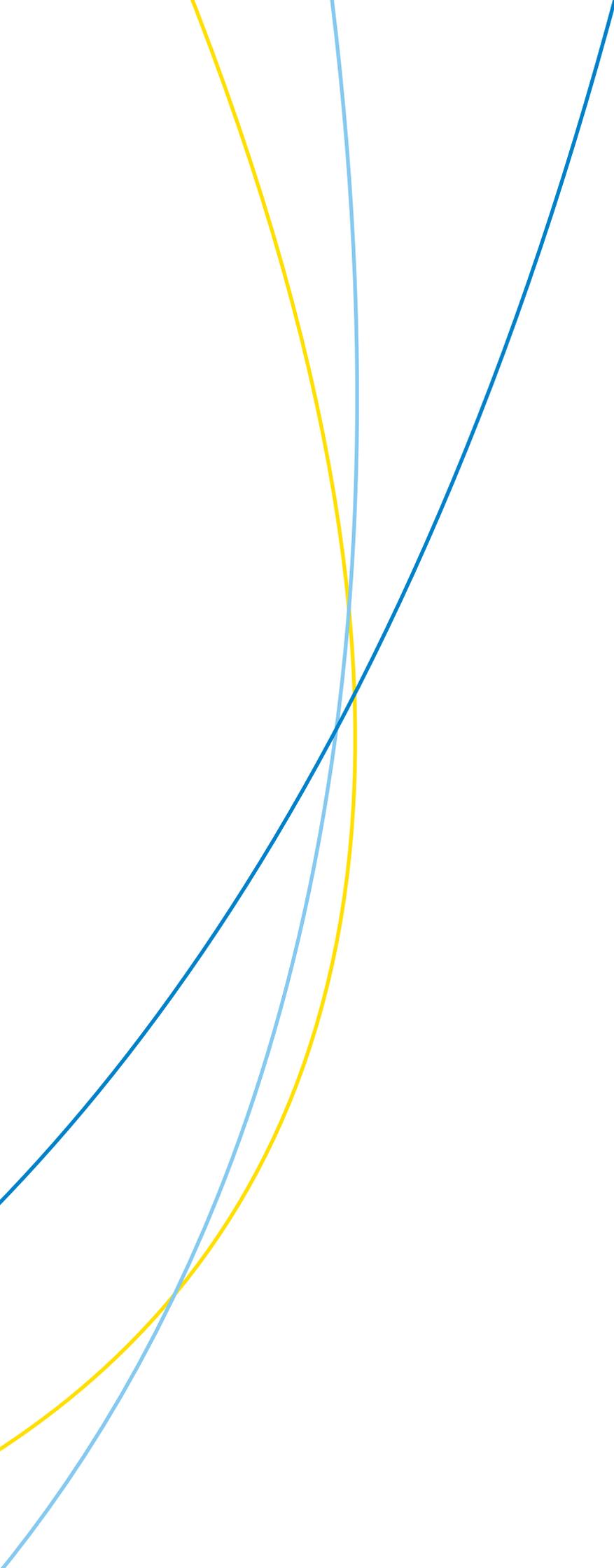


# Energy Management Solution

Increased return, reduced emissions.

 **SAUTER**  
Creating Sustainable Environments.





# Learn more. SAUTER EMS at a glance.



## Created from experience

What are the reasons? As a specialist in energy-efficient buildings, SAUTER puts energy management in the spotlight. There are compelling reasons to use EMS.

## Energy management according to ISO 50001

Introducing an energy management system is one of the greatest challenges for companies. EMS supports all the requirements for certification according to ISO 50001, which then opens up the opportunity for a company certification.

## Methods of energy efficiency and certification

Regular improvements are an essential part of energy management. Special methods and certifications can be used here to determine the potential for saving energy.

## The future according to plan

Working systematically. SAUTER EMS covers numerous tasks in the ten-point ECO<sup>10</sup> programme. This allows you to reduce operating costs in a controlled fashion and ensure a lasting contribution towards climate protection.

## EMS for all needs

Are you a CEO, facility manager or head of technical services? EMS offers tailored information and tools for diverse requirements. Discover the benefits to you personally.



### **Best suited**

Where do you use EMS? EMS can identify savings potential in any industry. Some categories of business, however, can benefit particularly.

### **Worldwide success stories**

What crucial role does energy play? Where is EMS used? EMS records energy-related data and analyses the savings potential for your business. Today, many businesses and institutions of very high standing are already benefiting from SAUTER EMS. Learn how our clients' energy consumption has been reduced thanks to EMS.

### **SAUTER and SAP Research work together**

Into the future with EMS. Energy is an important factor in manufacturing industries. SAUTER and SAP Research are developing a successful research partnership with the aim of constantly improving the energy consumption data.

### **EMS highlights**

Are you familiar with the highlights? EMS is very flexible, yet complies with the standards; it is readily extensible; it visualises the energy consumption and, consequently, enables it to be constantly improved. Get an idea of how it all works.

## Created from experience.

Choose SAUTER. We have been creating pleasant conditions in living spaces the world over for more than 100 years. We reduce both your costs and your CO<sub>2</sub> emissions at the same time. You and the environment both benefit from our solutions for your building.

We understand energy flows, and regulate them accordingly. In our view, this is where our responsibility lies: to ensure efficient operation over the entire life-cycle of the building and to conserve the resources of our environment. This depends not only on having the right systems in place, but also on the strength of the services available.

Particularly with regard to properties spread over a wide area, transparency and the visualisation of energy consumption are important basic prerequisites for being able to carry out optimisation measures. A central management system is at the heart: Energy Management Solution, or EMS, by SAUTER. The clear portrayal of your energy flows using EMS not only helps to illustrate the potential for making huge savings, but also stands up to all practical demands.

### Reasons:



- EMS provides continuous and up-to-date monitoring of energy consumption and identifies any increases in energy consumption immediately. This enables you to reduce your operating costs permanently.



- EMS is a fundamental component for implementation, certification and compliance with national and international standards such as ISO 50001:2011 (replacing EN 16001), LEED, BREEAM, DGNB, HQE, Green Calc+ and so on.



- EMS displays the energy consumption levels, enabling you to make significant reductions in CO<sub>2</sub> emissions in order to preserve the environment.

- EMS offers long-term investment protection by supporting different manufacturers and standardised protocols. This reduces the cost of your investment and the associated costs.

- The modular concept of EMS makes planning more reliable, since the system is readily extensible and very versatile. It meets all current standards and, consequently, leads to lower acquisition costs.

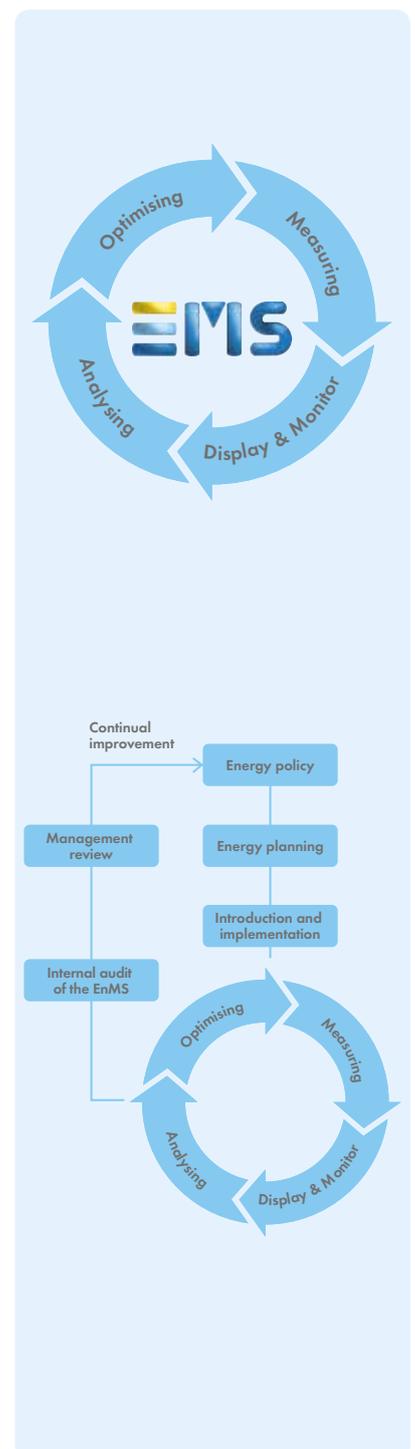
## For energy management systems according to ISO 50001.

There is a need for companies to introduce energy management systems, as well as to become certified or officially audited, which is also supported through legislation in various countries. The main aim of the legislation is to meet the targets of climate protection. The targets for each company should be defined more extensively. This is a matter of using different forms of energy efficiently, thereby reducing costs and, ultimately, increasing the competitiveness of the company.

The main aspects of the ability to implement an EMS in a company are the project team's remit and the support – and, indeed, involvement – of senior management right the way up to CEO level. The actual involvement of end customers and users in the property is also one of the key elements of successful implementation. Management should specify the energy policy of the company and set appropriate targets and schedules with the project managers.

EMS provides full measurement, analysis and monitoring of the various energy consumption levels. Further optimisation measures are derived from this, and they provide the energy management team, the EMS project managers or senior management with a basis for decision-making.

When analysing and developing proposals for improvement, SAUTER provides skilled specialists in energy efficiency measures and acts in accordance with the illustrated optimisation principle. This is used in the ISO 50001 standard and is based on the PDCA method (plan, do, check, act) for various quality management processes.



## Methods of energy efficiency and certification.

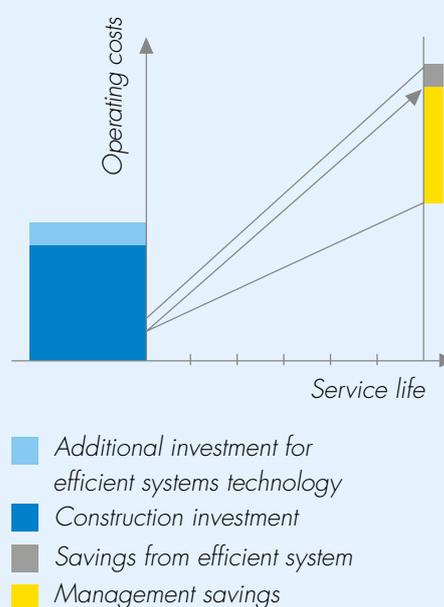
SAUTER uses the latest methods for developing and assuring the energy efficiency of automation systems. They augment the company's many years of experience in building management systems and automation. Our specialists are members of various committees for standardisation and use models such as the EN15232 as well as the certifications for energy-efficient building automation systems. The first certifications according to eu.bac systems and the optimisation measures based on them have already been implemented.



In particular, the day-to-day operation of a building provides a high potential for optimisation and, therefore, cost-saving over the years. This is why it is essential to take into account the investment needed for efficient system technology during the planning phase of the building.

“The operating costs of a building, calculated over a decade, are about as high as the total initial investment in the technical infrastructure in a new building, including the building automation system. These costs can be reduced with additional investments in energy-efficient systems technology and more comprehensive building automation. Through optimal management, these operating costs can again be significantly reduced. Optimal management requires all energy-related data to be collected and processed by an energy management system (software). By visualising this data, all important processes and parameters can be made transparent. The building manager thus has a tool for continuously improving a building's energy consumption. This way, building owners save money in the long term and, at the same time, preserve the environment.”

Prof. Dr.-Ing. Rainer Hirschberg  
FH Aachen  
Course of studies: Architecture (technical infrastructure and sustainable construction methods)



# The future according to plan.

EMS reflects our high aspirations for planning and implementing energy usage in buildings efficiently and in an environment-friendly manner. To do so, we apply our ten-point programme, ECO<sup>10</sup>.

SAUTER EMS enables us to implement many of this innovative efficiency programme's points for you directly. Using EMS, we centralise and visualise all the energy-related information, which enables us to compare your consumption levels with internal and external benchmarks.

This allows us to minimise your emissions and, therefore, to make a lasting contribution to climate protection. Especially if we can rely on products and solutions from

SAUTER that are both forward-looking and certified by eu.bac. EMS consistently supports our strategy for open, interoperable and flexible building automation and the seamless integration of all specialist systems.

In so doing, SAUTER EMS shows how important it is that the users adopt energy-conscious behaviour in day-to-day situations. This is where our energy management system reveals its potential. That's why, with point 10 of our ECO<sup>10</sup> programme, we make a remarkable promise: we ensure that your operating costs are reduced.

**SAUTER ECO<sup>10</sup>: the solution to energy wastage and unnecessary costs. EMS makes it easy to see.**

We **monitor** and **measure**, we **analyse** and **evaluate**, we **react** and **optimise**, and we accompany buildings into the **future**.



**SAUTER ECO<sup>10</sup>**, a ten-point programme enabling SAUTER to demonstrate its extensive solution expertise for increasing energy efficiency.

1. CENTRALISATION and VISUALISATION of all energy-related data
2. Critical analysis of CONSUMPTION: benchmarks from internal and external sources
3. Tailor-made ENERGY CONCEPT for the whole life-cycle of the building
4. Evaluation of RENEWABLE ENERGIES
5. Drastic REDUCTION in CO<sub>2</sub>-EMISSIONS
6. Certified PRODUCTS and SOLUTIONS that are geared towards the future
7. Open and universal BUILDING AUTOMATION SYSTEMS
8. The BUILDING'S ENVELOPE, building automation system and technical systems all in accord with each other
9. A CHANGE IN USERS' ATTITUDES towards energy-saving
10. Definite REDUCTION in OPERATING COSTS



Life-cycle of the building

A new building is created

A

Value-preservation measures during the life-cycle

B

C

# How does EMS benefit you? You are a...



## ... CEO or CFO

Decision-makers rely on EMS. This not only guarantees a good CO<sub>2</sub> balance, but makes the balance sheet look good as well. Because nowadays, cost transparency, savings and environmental protection are a matter for the boss. Additionally, the portrayal of a company as being responsible with regard to the handling of resources and the efficient and environmentally-friendly usage of energy is an important part of the business strategy and the company's philosophy ('corporate social responsibility').



## ... facility manager or building operator

Building operators work with EMS. EMS enables energy consumption to be monitored centrally and costs to be kept under control. This is an advantage because, especially when properties are spread over a wide area, facility managers need to be able to continuously monitor their buildings in order to maintain efficient operation.



## ... property owner

Owners benefit from EMS. The positive external effects of a reduction in emissions increase the attractiveness of a rented property. Nowadays, the increase in a property's value and the protection of the capital investment can be achieved only with a modern energy management system.



## ... technical director

Technical directors have it easier with EMS. Finally, the immediate notification of deviations enables instant intervention. Because the energy values are updated daily, technicians are now much better informed. This ensures a faster response, higher service quality and, therefore, greater customer satisfaction.

## Best suited.

Energy management solutions can uncover valuable savings potential in any industry.

SAUTER EMS is particularly successful when used in the following cases:

- Branch offices with a high potential for optimisation by applying the findings from one branch to the entire network of branches
- Data centres with continually-increasing computing capacity
- Property management with a portfolio of several rental properties
- Airports with buildings and docks spread over a wide area
- Management buildings with numerous complex office units
- Manufacturing companies
- Office buildings with regular changes of tenant and central management
- Hospitals, clinics and medical facilities with buildings spread over a wide area



## Energy is one of the main factors when assessing costs and CO<sub>2</sub> emissions.

Reducing energy consumption is of great interest to any company. However, many firms are not sure how to go about achieving it. Using the SAUTER EMS software, they have an instrument that enables them to introduce the right measures and take the appropriate steps for the future.

How high are the actual consumption figures, and what is the energy consumption of the various energy sources, parts of buildings, production zones/facilities or even whole buildings? These questions are posed at the beginning of every energy management project, and the SAUTER EMS (Energy Management Solution) software provides the answers to them. There are three

important outcomes that have a very positive effect on any decision regarding EMS: the reduction in energy consumption, the fall in CO<sub>2</sub> emissions and the lower costs.

### **Well prepared for the future, thanks to EMS**

By using EMS, companies can reduce their operating costs substantially: depending on the circumstan-

ces, savings of up to 40% on energy costs can be achieved. This, in turn, enables companies to reduce their CO<sub>2</sub> emissions quite markedly. Moreover, thanks to EMS, they are well equipped to fulfil all the existing and future legal requirements with regard to energy targets and environmental protection. Only those managers who carry out exact measurement and proper analysis can



lay the foundations for a secure future for their company in the interests of active sustainability.

### Numerous advantages

Moreover, EMS is an extremely flexible system, because it can always be matched to the customer's exact requirements. Using the data recorded, the EMS presents the energy consumption clearly and simply, and

interprets it meaningfully; as a result, the user has a system of active and optimised energy management at his disposal. This makes it easy to identify savings potential in energy consumption at a glance and, as a result, to operate production facilities and buildings more economically. In a nutshell, companies can attain their energy targets much more easily, thanks to EMS. It helps companies to

increase their efficiency and productivity and, consequently, to improve their entire energy creation chain. As a specialist in energy-efficient overall solutions, with many years of experience of energy management, SAUTER is the ideal partner for consultancy, implementation and service provision with respect to EMS.

### Coping intelligently with complex requirements

In the world of building automation, SAUTER is very much in demand as a provider of solutions across various industries – and has been for many years now. As a result of this expertise and over a century of know-how, state-of-the-art buildings are being constructed all over the world. Furthermore, because they are equipped with future-orientated technologies, they offer clear advantages over their competitors in terms of availability, security of investment and energy efficiency.

Three main advantages of SAUTER EMS:

- Visualisation of energy consumption, comprehensive analysis options and support for certification
- Lower CO<sub>2</sub> emissions
- Reduced costs



# EMS in Life Sciences:

## Boehringer Ingelheim starts pilot project to reduce energy costs and CO<sub>2</sub> emissions

The Boehringer Ingelheim engineering department plans to reduce energy requirements and CO<sub>2</sub> emissions at the Ingelheim site by 20 per cent by 2020. To do this, the company is relying on SAUTER EMS. By analysing 5 000 data points and meters within the pilot project in Ingelheim, it was noticed that energy requirements for air treatment occurred mainly in the laboratories, so this was the area in which savings potentials were at their largest. It also became apparent that a savings potential much greater than expected can be achieved through user behaviour. Consequently, a savings project was initiated and the company has already taken a step further towards achieving its ambitious goals as a result.

Nowadays, it is very simple to determine energy consumption per room. However, to illustrate the energy requirements per cubic metre of supplied air is a challenge that can be met only with the right software solutions. For this, SAUTER EMS initially records the energy levels per ventilation system and calculates the energy costs per cubic metre of transported air. Volume flow measurements at each consumer point mean that the amount of air per hour fed into each individual room can be identified. On

this basis, the energy costs per user and/or per room can be calculated and presented in accordance with the 'polluter pays' principle.

For this analysis, the values from the temperature, pressure and humidity sensors (amongst others) are visualised with the building management system and forwarded to EMS. Another advantage is that, through the installation of building and laboratory automation, there was a high automation density of measuring and control

systems, meaning that around two thirds of all of the planned new meters were able to be installed as virtual versions – which clearly reduced the investment costs.

### **First optimisation procedure carried out**

The EMS analysis at Boehringer Ingelheim showed that a large portion of the energy requirements for the ventilation and air-conditioning occurs in the laboratories. Klaus Roos, from the engineering department of Boehringer

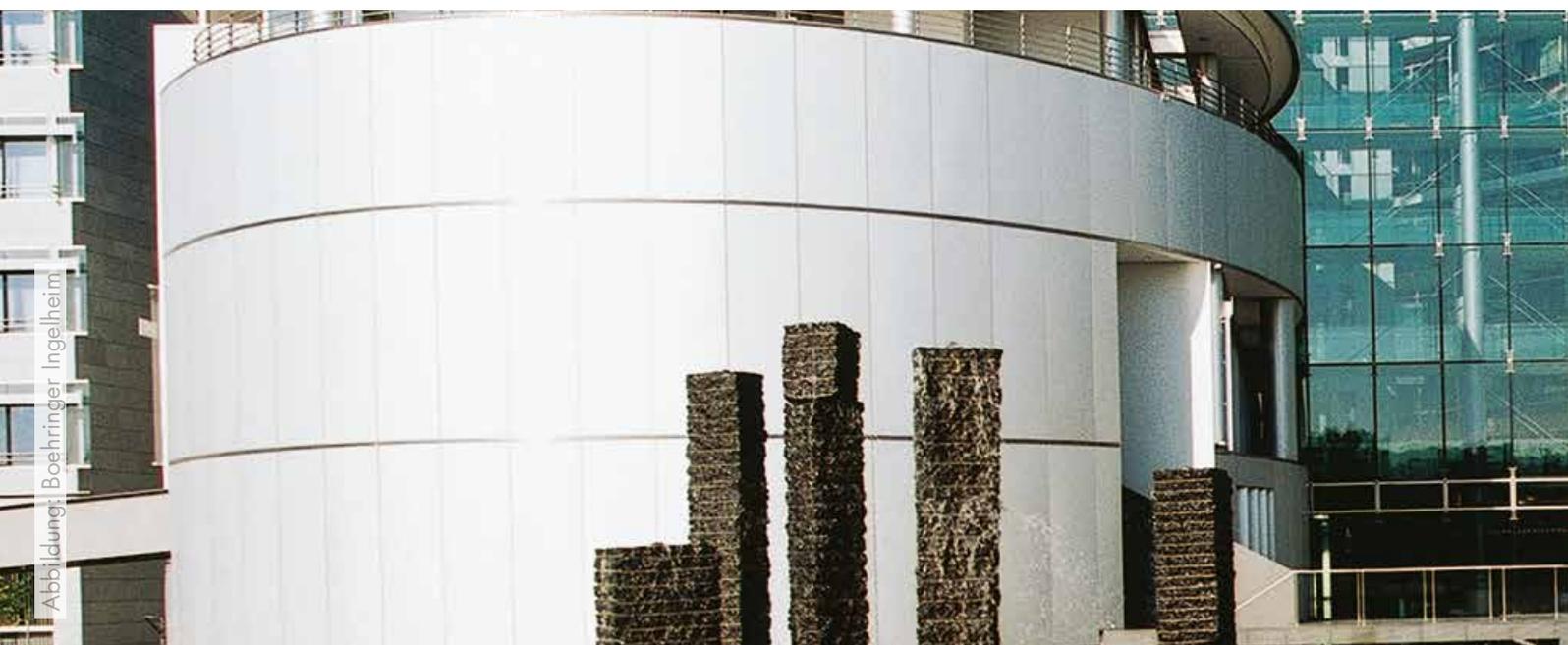


Abbildung: Boehringer Ingelheim



Ingelheim, explained that the result could be defined even more precisely, "We were able to find out that most of the energy is used specifically for humidification." Subsequently, specific measures were taken in order to improve the systems technology still further. Because the ventilation of the rooms is effected by a central air-handling unit, volume-flow controllers with active positional feedback are employed. "To improve the running of the system, we had to find out which volume-flow controllers are the least efficient, i.e. where most pressure is wasted," explained Sven Pohlmann, another specialist in the engineering team at Ingelheim. A lower pressure is then set for the entire system, which significantly reduces energy consumption.

#### **Integrated reporting function as per EnEV**

The reporting system that is integrated in SAUTER EMS benefits the operator because, in order to comply with the Energy Saving Ordinance (EnEV 2009), an energy inspection must be carried out every ten years. The EnEV stipulates that energy performance figures must be documented for all new buildings and for any public buildings that undergo energy-related refurbishments. Any building operator who cannot produce these figures risks a high fine. Therefore, external companies are often tasked with collecting such data and this, of course, causes additional costs. "Because of this, we have developed – in collaboration with the Ingelheim engineering staff – an application which automatically

creates the required documentation," explained Alfred Streit, project manager at SAUTER. As a result, a sort of inspection tool was created.

#### **Further projects planned**

As a result of the experience gained from the pilot project in Ingelheim, the engineering team are planning to install SAUTER EMS in other buildings. For the next project, the so-called comfort zone is to be brought into line with the process specifications and energy-related optimisations. The aim is to guarantee comfortable warm conditions in dry, cold winters when there is an air humidity of at least 30 per cent static humidity. By contrast, pleasantly cool conditions and a slightly lower air humidity are provided in the warm and humid summer months.



#### **Boehringer Ingelheim**

The pharmaceutical producer Boehringer Ingelheim was founded in 1885 in Ingelheim, Rheinland-Pfalz, Germany. This research-intensive company currently has 41 300 employees throughout the world. On the company's research campus in Biberach an der Riss, in the state of Baden-Württemberg, there is one of the largest and most state-of-the-art cell culture production facilities in Europe; it is called the *Biotechnikum* and has been in operation since 1985. The facility enjoys an international reputation for its biotech pharmaceutical products.

# EMS at EuroAirport: one system for completely different buildings.

For an airport such as the tri-national EuroAirport Basel-Mulhouse-Freiburg, keeping an overview of flight movements at all times is essential. It is almost as important to be able to know the energy consumption of the many buildings on the airport site at any given time. SAUTER's EMS software solution provides all energy data at a glance and helps the EuroAirport to use resources efficiently and sustainably.

In 2009, the EuroAirport required 96023 megawatt hours of energy, mostly in the form of electricity and natural gas. It is worth taking a close look at the actual consumption figures in order to identify where there is potential for savings.

## A variety of uses

On the site of the EuroAirport Basel-Mulhouse-Freiburg, there are numerous buildings and facilities used for very different purposes – from the passenger terminal to the aircraft hangar and the storage building to the control tower. Accordingly, the requirements for the indoor climate can be quite different,

depending on the building's usage. With so many different types of energy users, it is a challenge to keep track.

For this reason, the EuroAirport decided in 2010 to improve its energy consumption. The first step was to determine guidelines for energy consumption. Then, an energy performance diagnosis was carried out on all buildings. While this pointed to where improvements were needed, it presented only a snapshot. Therefore, it was time to find a system that allowed the complex energy consumption of the EuroAirport to be monitored in real time.

## One for all

The requirements for the new monitoring and energy management system were correspondingly high. Not only did it have to be compatible with existing building management systems and allow the use of various third-party systems and information sources such as the list of suppliers, but also be flexible, user-friendly and easy to use. SAUTER's EMS software solution for active energy management was convincing, as it met all the requirements in full.



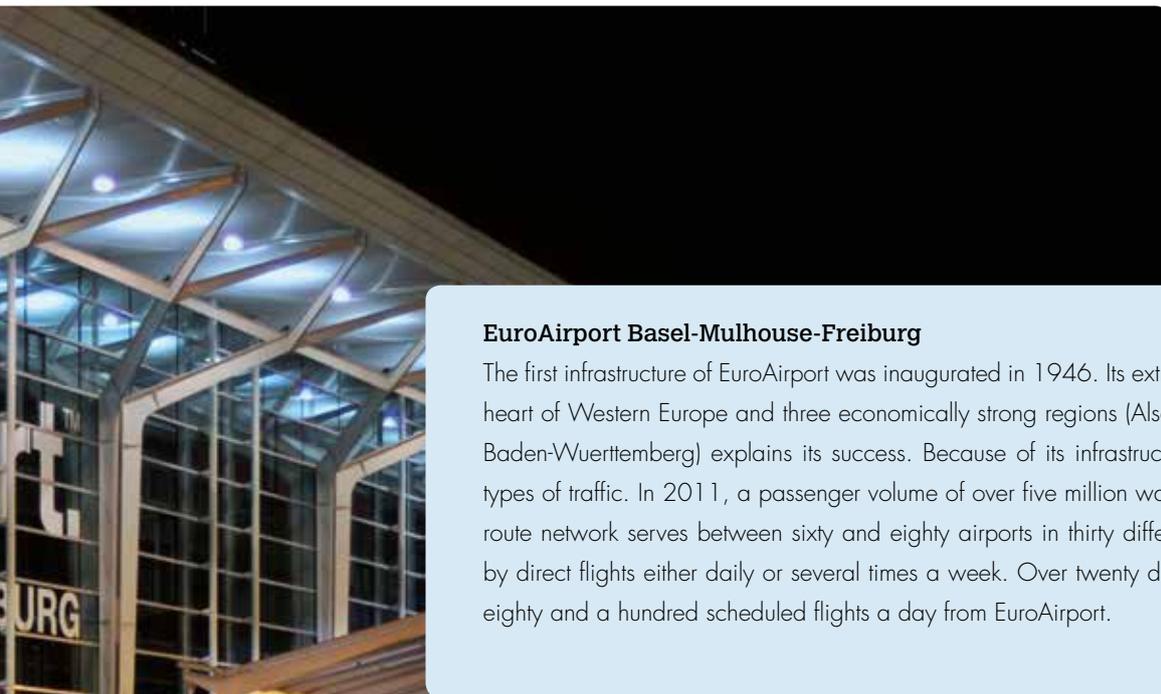


### Energy data at a glance

SAUTER Energy Management Solution (EMS) integrates, visualises and compares consumption data over any period of time and shows all relevant energy data at a glance. Fluctuations in energy consumption – for example, over the course of the day – are easy to identify and adjust. Data verification is performed in real time and is displayed continuously and dynamically. As soon as a specified limit value is exceeded, the system sends out an alarm in the form of an e-mail or a text message.

Philippe Gauthier, Director of Technical Services at EuroAirport, is very pleased with SAUTER's EMS software solution: "The special advantage of this solution is the ease with which data and analysis can be integrated. This is the only way that we can achieve the necessary standard in terms of environmental progress and optimal operation of the technical systems. That this integration project was concluded successfully is due to the project management and the reliability of SAUTER EMS. Overall, the energy-related improvements have led to significant savings."

"The aim of bringing our energy consumption under firm control and, therefore, of achieving our savings targets and reducing our environmental footprint called for a continuous and reliable system of measurement and reading that is easy for the operator to use. At the same time, the diversity of the existing technical facilities had to be taken into account. Above all, it was the flexibility of the SAUTER EMS solution that convinced us, and that now provides us with the ability to meet our demands," says Vincent Devauchelle, deputy director of EuroAirport.



### EuroAirport Basel-Mulhouse-Freiburg

The first infrastructure of EuroAirport was inaugurated in 1946. Its extremely convenient location in the heart of Western Europe and three economically strong regions (Alsace, north-west Switzerland and Baden-Wuerttemberg) explains its success. Because of its infrastructure, EuroAirport can handle all types of traffic. In 2011, a passenger volume of over five million was recorded for the first time. The route network serves between sixty and eighty airports in thirty different countries, which are linked by direct flights either daily or several times a week. Over twenty different airlines provide between eighty and a hundred scheduled flights a day from EuroAirport.

# The sustainability factor leads Rabobank to choose SAUTER EMS.

The new Rabobank Nederland administration centre in Utrecht was built with sustainability foremost in mind. Sustainability and energy efficiency, not least in terms of the materials and installations used, were key aspects in the construction of the two 105-metre-high, glass-clad towers. This is why Rabobank chose the SAUTER EMS.

Sustainability and the environment are key considerations for Rabobank. This was shown not only in the construction of the new bank in the centre of Utrecht, but also in the demolition of the old Rabobank building that stood on the same site: almost all (98%) of the materials from the demolished building were recycled. Hundreds of tonnes of glass were melted down and re-used, partition walls and security doors were taken and installed in one of the bank's other buildings, and the large water pump was sent to a school in Malawi.

Sustainability was also foremost in the construction of the new building. For example, it has an extremely low energy performance coefficient: thanks to the efficient use of energy, it is 35 per cent lower than the level prescribed by the Dutch government. As well as this, the fact that SAUTER manufactures all its products in line with the RoHS (restriction of hazardous substances) standard was one of the deciding factors in Rabobank Nederland's choice.

Buildings in the Netherlands are evaluated for sustainability on the basis of the GreenCalc certification, which takes into account factors such as the consumption of energy, water and building materials. With a score of over 300 points, the Rabobank in Utrecht is one of the most sustainable buildings in the country.

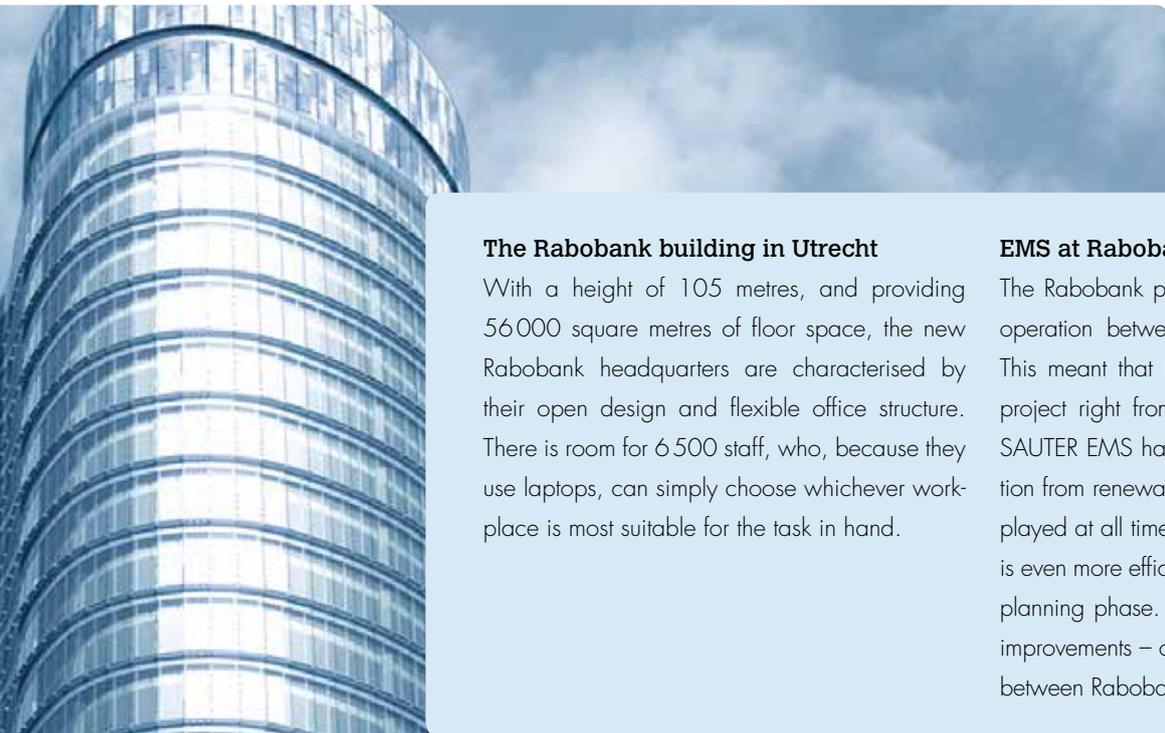
Rabobank insists that all its buildings use a minimum of construction materials, energy and water, which is why it uses recycled materials and





renewable energy wherever possible. Because transparency and sustainability are core values for Rabobank, it chose SAUTER to supply the energy management system for its building in Utrecht. At the heart of the EMS solution for Rabobank is a sophisticated metering concept. "The flexibility and strength of the SAUTER EMS particularly came into play during the implementation phase, because we were able to tailor the system to our needs easily and simply", says Nardi Kemp, Project Manager at Rabobank.

All in all, the SAUTER EMS helps Rabobank in its efforts to ensure sustainability. The Rabobank Group summarises the principle: sustainability has to be accepted, and everything that is accepted has to be sustainable.



#### **The Rabobank building in Utrecht**

With a height of 105 metres, and providing 56 000 square metres of floor space, the new Rabobank headquarters are characterised by their open design and flexible office structure. There is room for 6 500 staff, who, because they use laptops, can simply choose whichever workplace is most suitable for the task in hand.

#### **EMS at Rabobank**

The Rabobank project was marked by close co-operation between the customer and SAUTER. This meant that Rabobank had control over the project right from the start. The structure of the SAUTER EMS has been chosen so that consumption from renewable energy sources is clearly displayed at all times. We are pleased to say that it is even more efficient than was forecast during the planning phase. There are plans to make further improvements – once again in close co-operation between Rabobank and SAUTER.

# Charles de Gaulle airport complies with environmental guidelines thanks to SAUTER EMS.

Satellite 3 (S3 for short) of Terminal 2E at Charles de Gaulle airport in Paris has 225 000 square metres of floor space spread over seven levels, providing a handling capacity of 8.5 million passengers. In 2011, S3 was equipped with SAUTER EMS. This investment brought energy savings of 38 per cent compared with 2010 – for heating alone.

In order to guarantee a consistently high level of interior comfort and continuous energy monitoring, Charles de Gaulle airport sought an easy-to-use measurement system that provides comprehensive analysis capabilities and generates detailed graphs and comprehensive reports – and found it in SAUTER EMS. The system is able to verify whether the energy produced is equivalent to the energy consumed. After the generating plant has calculated the energy via totalisers, it is passed on to the consumers. All parts of the network are equip-

ped with meters, which, in turn, are connected to the EMS. This enables the energy consumption to be tracked and monitored, and also to be analysed and processed on a daily basis.

In addition, the EMS energy management software and the monitoring system for the technical installations are permanently connected with each other, so that settings for the installations can be adjusted in order to achieve the stated objectives without compromising the comfort of the passengers.

Compared with 2010, the amount of hot water used for the heating system in S3 was reduced by 38%. Admittedly, the mild outside temperatures certainly played a role, this year, but the daily monitoring of energy consumption meant that the control devices were set according to demand, thereby enabling energy to be managed optimally. The consumption of chilled water, domestic cold water and electricity was considerably reduced in relation to the targets and the previous year's consumption. For instance, the con-





sumption of chilled water decreased by 3 per cent compared with the targets, and by 6 per cent compared with the year 2010. In relation to the targets for 2011, consumption of electricity fell by as much as 8 per cent. Furthermore, consumption of domestic cold water decreased by nearly 4 per cent compared with the previous year.

Since July 2012, Satellite 4 (S4) of Terminal 2E, which has a handling capacity of 7.8 million passengers a year, has been equipped with

meters for hot water, chilled water and mains water networks which, in turn, are all connected to EMS. This enables Satellite 4 to meet the new French HQE standards regarding high environmental quality (*Haute Qualité Environnementale*).

Alain Stephan, the manager responsible for technology and installation at S3 and S4 at Charles de Gaulle Airport, says: "Environmental aspects are taking on an increasingly important role in our daily business. For this reason,

energy has to be managed well. EMS offers simple energy monitoring and a comprehensive overview of our energy expenditures."



### **Aéroports de Paris and Charles de Gaulle airport**

*Aéroports de Paris* is the second-largest European airport group for passenger traffic and the principal one for cargo and courier services. It owns and manages the three main airports in the Paris region: Paris-Charles de Gaulle, Paris-Orly and Paris-Le Bourget. Paris-Charles de Gaulle, which handled 61 million passengers in 2011, is the major international airport in France and the second-largest in Europe. Paris-Charles de Gaulle is the worldwide hub for Air France-KLM and the main European hub for the SkyTeam alliance. The airport platform is the base for 700 companies and approximately 90 000 employees, which makes it one of the most important business sites in the Île-de-France region.

### **EMS at Aéroports de Paris**

The use of the SAUTER EMS solution at *Aéroports de Paris* will gradually be extended to other installations in order to make further savings and perform administration centrally. Since December 2011, time-consuming manual processes – such as taking meter readings – have been performed automatically, and the introduction of remote data acquisition has significantly simplified invoicing. As part of a second phase, the measuring of energy consumption will be summarised in order to be able to adjust consumption accordingly.

SAUTER's EMS software is an indispensable tool for meeting the targets imposed by environmental standards such as HQE.

# The MERIAN ISELIN CLINIC meets the highest quality standards – thanks, not least, to SAUTER EMS.

As hygiene standards rise, air treatment is becoming an increasingly important aspect of building automation. Requirements for individual buildings, strict air hygiene guidelines and a high degree of automation mean that user-friendly systems are more important than ever. The SAUTER EMS software can adapt the ventilation system to individual requirements.

Modern buildings usually require all the rooms to be fully air-conditioned. Regardless of whether they are conference rooms, libraries, auditoriums, hospitals or clinics, the choice of system is always based on the room utilisation profile. In order to optimise the energy balance, the pre-treatment and post-treatment of the room air have to be precisely tuned to each other. The close harmonisation of room air quality and energy optimisation is also of the utmost importance for demand-led ventilation systems. Heat recovery is a key feature of contemporary building ventilation systems, because

the use of waste heat minimises the primary energy required. However, this procedure requires zone-specific solutions, which is where SAUTER EMS is most valuable.

Efficient energy management in hospitals is vitally important, given that the cost of health care continues to rise. The MERIAN ISELIN CLINIC in Basle uses SAUTER EMS. It not only helps the clinic to meet its exacting quality standards, but also contributes towards its long-term economic success.

SAUTER EMS helps to make use of existing potential for optimisation in energy monitoring. By analysing key energy performance characteristics, the MERIAN ISELIN CLINIC was easily able to identify potential improvements, reduce overall costs and calculate individual cost items. Any malfunctions can now be identified immediately. Standard reports allow efficiency to be checked at any time. This means that the MERIAN ISELIN CLINIC always enjoys complete transparency with regard to energy consumption. In a nutshell, SAUTER EMS provides those





responsible at the clinic with a wealth of system information that helps to reduce costs and increase efficiency.

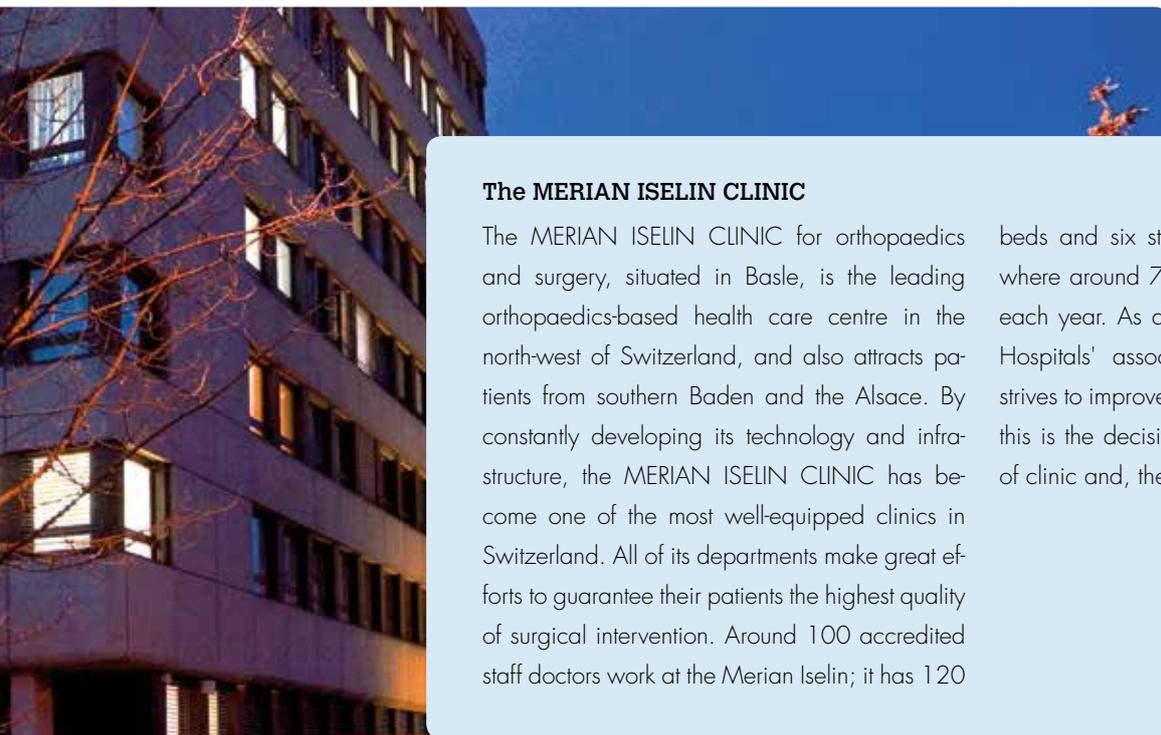
The ventilation systems are a striking example of how user-friendly SAUTER EMS is. For example, it is possible to record and assess the performance of a ventilation system over a whole year on a single diagram. SAUTER EMS has a built-in formula editor that allows the target energy saving to be directly converted into the concomitant reduction in costs. Because the data

are shown in this way, it is possible to view the savings made after the initial optimisation measures were taken, thus providing a way of directly monitoring performance.

**Stephan Begert, Head of Engineering and Security at the MERIAN**

**ISELIN CLINIC:**

*"The MERIAN ISELIN CLINIC introduced SAUTER EMS in stages between 2010 and 2011. In some areas, we have already achieved energy savings of up to 30 per cent."*



**The MERIAN ISELIN CLINIC**

The MERIAN ISELIN CLINIC for orthopaedics and surgery, situated in Basle, is the leading orthopaedics-based health care centre in the north-west of Switzerland, and also attracts patients from southern Baden and the Alsace. By constantly developing its technology and infrastructure, the MERIAN ISELIN CLINIC has become one of the most well-equipped clinics in Switzerland. All of its departments make great efforts to guarantee their patients the highest quality of surgical intervention. Around 100 accredited staff doctors work at the Merian Iselin; it has 120

beds and six state-of-the-art operating theatres, where around 7,000 operations are performed each year. As a member of the 'Swiss Leading Hospitals' association, the clinic permanently strives to improve its quality standards. Ultimately, this is the decisive factor in the patients' choice of clinic and, therefore, in its long-term success.

# SAUTER EMS as an element of corporate social responsibility

In 2010, SAUTER EMS software was introduced into the Lindt & Sprüngli chocolate factory in Aachen in order to monitor the efficiency and savings potential of a new compressor system. The detailed monitoring provided by SAUTER EMS enables savings potential to be identified, then continuously recorded and documented. Analysis of the EMS data showed that the compressor system needed some improvements in terms of efficiency, which offered a savings potential of around 8 per cent of the energy costs. As a result, Lindt & Sprüngli decided to expand the use of EMS – and to great success.

With effect from 2013, companies in Germany in possession of a certified energy management system as per ISO 50001:2011 can apply for an energy tax refund. This supersedes the certification as per EN 16001. Apart from the high energy savings potential calculated by SAUTER, this was an additional reason why Lindt & Sprüngli chose to rely heavily on EMS. SAUTER EMS

is now used comprehensively at the site in Aachen. It is used to monitor the provision of heating, cooling and compressed air, the consumption of electricity and the distribution network of various building services.

Nowadays, EMS continuously records Lindt & Sprüngli's energy consumption. These records can be used as evidence for the energy tax

refund. SAUTER EMS is an inherent part of the certification according to DIN ISO 50001, which the Aachen plant of Lindt & Sprüngli successfully obtained in December 2011. Furthermore, SAUTER EMS contributes significantly towards the continuous optimisation and monitoring of the production facilities at Lindt & Sprüngli with regard to energy consumption.

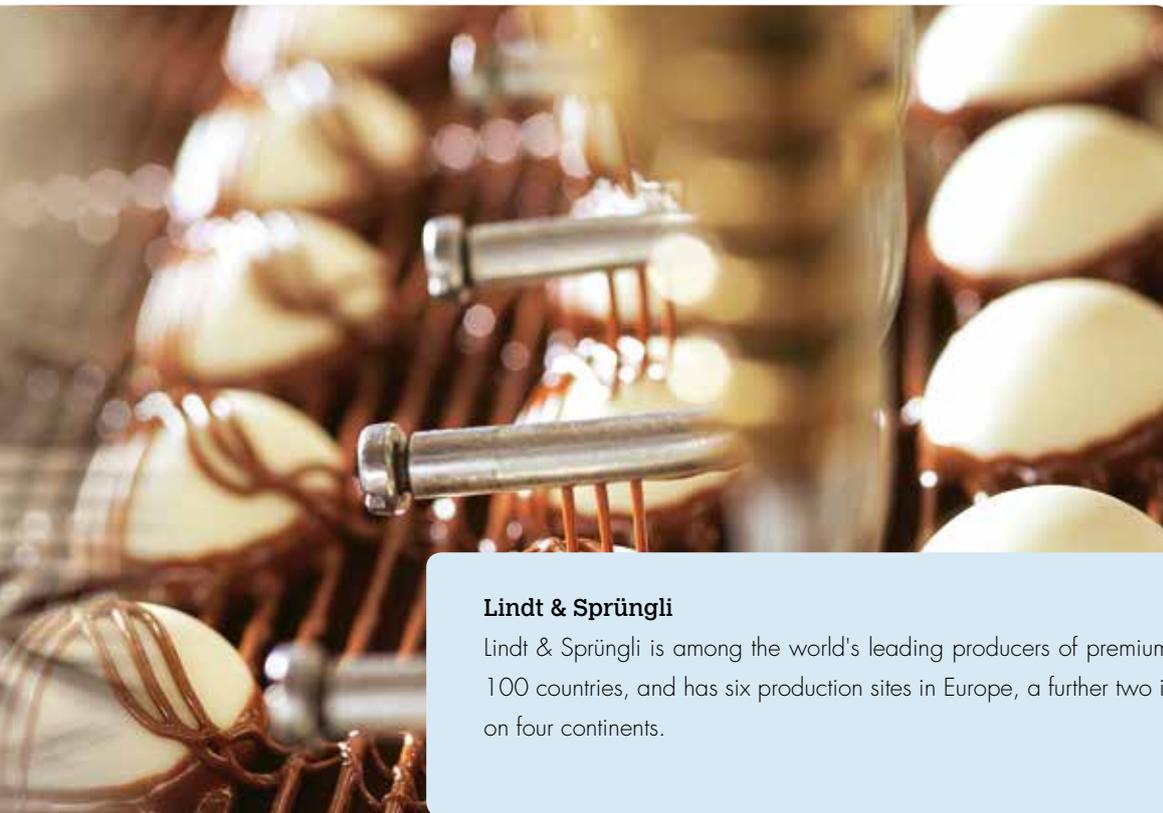




In the future, the actual energy costs can be correctly apportioned to the various departments at all times thanks to the comprehensive system of measurement using meters and the clear presentation of energy consumption by each production zone. At the same time, the energy management system will also provide the data for the allocation of costs in Lindt & Sprüngli's production facilities.

Moreover, SAUTER EMS also functions as a central monitoring and optimisation tool for energy consumption levels. In a further stage of expansion, the level of detail and scope of operation will be increased to include immediate notification of deviations from the setpoints in the measurement results. This helps to prevent the occurrence of any 'unpleasant surprises' in energy consumption levels. The

level of detail extends to the machinery, in order to identify any 'power guzzlers'.



### **Lindt & Sprüngli**

Lindt & Sprüngli is among the world's leading producers of premium chocolate. It is present in over 100 countries, and has six production sites in Europe, a further two in the USA and sales companies on four continents.

# SAUTER and SAP Research: innovative optimisation of energy consumption data.

Energy costs make up a growing portion of the total costs of industrial production. Most enterprise resource planning (ERP) and production planning and control (PPC) systems provide functions for monitoring and optimising the consumption of raw materials, machine utilisation and transport routes. However, what they lack are functions for integrated recording, evaluation and optimisation of energy consumption and the associated costs. By linking SAUTER EMS to the PPC, we can close this gap.

Before energy consumption can be optimised, its exact levels have to be ascertained. The energy usage of the machinery, production buildings, transport equipment and IT infrastructure has to be determined. The analysis also includes the quantity of energy produced by solar, wind and hydroelectric power plants, as well as stored energy. Weather dependency also plays an important role; this includes hours of sunshine, temperature, rainfall and wind speeds. The factors differ in each branch of industry, but, by meticulously recording the energy

used in making a product, it is possible to put a figure on the amount of energy actually required. As a result, the collected data can even be converted into a CO<sub>2</sub> assessment for each product.

Using this as a basis, the next step may be to evaluate alternative production processes or work schedules in terms of energy use, to tailor energy consumption to the energy supply or to improve the planning of energy consumption.

To this end, SAUTER has developed a prototype EMS-PPC in collaboration with the research department at SAP AG. This examines how the energy consumption of a production system – in other words, the production facilities and buildings – can be matched to the ever-changing supply of renewable energies. All processes that affect energy consumption levels are carefully analysed. The availability of renewable energy sources is also included, as are other factors, such as energy supply forecasts. The aim is to provide a system of production management





that attains the optimum in terms of energy efficiency. To do this, the production planning is illustrated in detail, showing all the various stages of production. Using smart meters, the amount of energy required for each stage of production can be clearly determined. Similarly, the energy consumption and availability for particular periods of time are also illustrated. A comparison of energy usage and availability facilitates decision-making and can be very useful in the event of a redesign.

The dynamic energy supply resulting

from fluctuating availability and changing prices produces a consumption curve that ideally matches the supply. By implementing a system of energy-optimised production, the prototype from SAUTER and SAP Research aims to match consumption to supply so that the two curves are more or less congruent. The SAUTER EMS then uses the raw data to calculate energy consumption profiles and supply forecasts, and then make initial evaluations and correlations. It subsequently sends the data at minute intervals to a so-called middleware for device integration (MDI). This is a prototype

from SAP Research that integrates all data sources, such as sensors, systems and so on. The MDI is also used for loading production plans from the ERP system. It forms the link between the EMS and the ERP.



*Energy Management Dashboard of the prototype developed.*



### **The SAP Future Factory Initiative**

The Future Factory Initiative was initiated by SAP Research in Dresden. It involves research projects by SAP Research and its industrial partners with the aim of promoting research and co-innovation in the manufacturing and processing industry. The Future Factory allows the interaction of new software and hardware solutions to be tested in a realistic testing environment and in various scenarios. There is a typical production environment for demonstrating the use of SAP products and SAP Research prototypes. SAUTER is one of more than twenty partners involved in the SAP Research Future Factory Initiative.

### **SAUTER and SAP Research**

The prototype developed as part of the project is one of the first practical results of the collaboration between SAUTER and SAP Research. This prototype can provide industry with a simple yet effective means of measuring, recording, analysing and forecasting energy consumption data.

# SAUTER EMS highlights.

## Transparency and visualisation of energy consumption

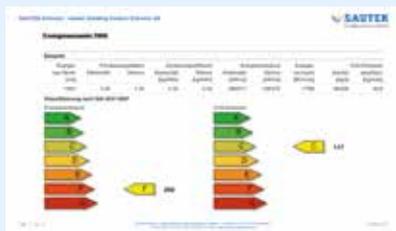
- SAUTER EMS logs your energy data and visualises your consumption using meaningful diagrams. In this way, any energy consumed by the heating, ventilation, cooling, lighting etc. becomes visible at a glance. Comparative displays of historical data – such as previous year, month or week – give the presentation even more substance.
- Key performance indicators and set-point referencing are available using web technologies.
- To be able to use SAUTER EMS, just a simple web browser is required. This makes access possible from anywhere – with the displays (either global or user-dependent) filtered centrally or locally. The central property management section provides an overview of all the buildings; it is also possible to make specific local portal views available to individual users.

## Flexible and standardised

- SAUTER EMS offers all the advantages of a modern cloud solution. You can call up your energy management information online and at any time, or have automated reports sent to you in different formats. The entire IT infrastructure and the support for the system is already included in the SAUTER EMS hosting solution. This solution provides you with absolute planning reliability and helps to keep your costs to a minimum.
- Would you like your own licence solution for storing your energy data? We are happy to incorporate SAUTER EMS into your own IT infrastructure as an alternative.
- Because of the wide range of connectivity options and the use of standardised protocols such as BACnet, SAUTER EMS can be used independently of any particular manufacturer. This enables parts of buildings and properties with third-party systems to be incorporated easily into SAUTER EMS.

## Continuous optimisation for reducing energy consumption

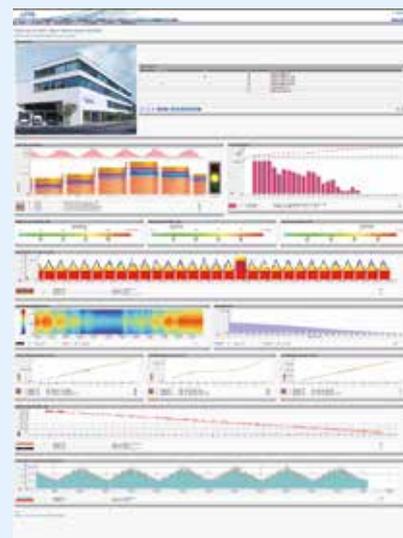
- EMS provides the foundation for the continuous process of optimisation throughout the entire life-cycle of a building. Because of the comprehensive statistical analyses and the comparisons based on benchmarks, direct comparisons and long-term analyses, large cost reductions are possible. SAUTER EMS constantly identifies savings potential that, depending on the degree of optimisation, can generate savings of over 40%.



Energy performance certificates adapted to various locally-set standards.



Overview of consumption used for calculating the additional costs.



Initial portal site with direct access to further portal sites for detailed information.

### Scalable and modular

- SAUTER EMS can record the data of individual buildings, rental properties, or even more widespread branch operations and properties – locally, in Europe and worldwide.
- The system can be easily expanded by various modules to include additional properties or branches. SAUTER EMS grows with your requirements.

### Modules for data acquisition

- Software Data Connector (SDC): module for collecting energy data from a building management system. The data is sent to the EMS server at configurable intervals and then automatically processed for visualisation. The SDCs are available for e-mail, SNMP, SQL and various BMS applications.
- Independently of BMS applications, two different data loggers (EDL) record the respective energy data using the BACnet, Modbus TCP/IP, MBus and KNX/IP protocols.

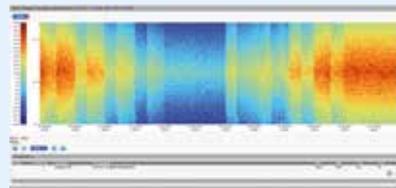
- The Energy Data Logger **EDL 1000** has a capacity of 10,000 data points and sends the recorded and buffered data point values to the EMS server at freely-definable intervals. The **EDL 50** is designed to handle up to 50 data points and can send the data to the EMS server either by Ethernet cable or by radio signal (GSM/GPR/Edge). In addition, the EDL 50 has an M-Bus level converter for connecting up to 25 end devices, such as meters.



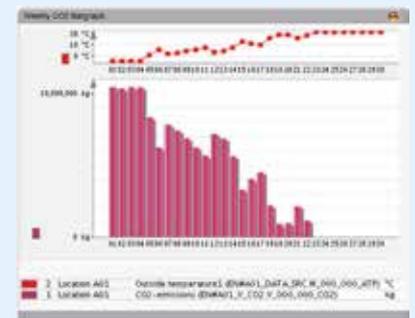
Instant overview via flexible portal sites.



Overview of annual energy consumption of various buildings plus the addition of heating degree days (HDD).



SAUTER carpet plot for monitoring daily values such as energy or temperature over a defined time period.



Daily CO<sub>2</sub> emission levels compared to outside temperatures.

## EMS Mobile

- EMS Mobile provides access to portals, alarms and manual input for smartphones and tablets based on Apple iOS or Android platforms.

**Entering the meter readings** in the smartphone improves efficiency substantially and eliminates a potential source of errors and delays, because the values are transferred directly and automatically from the smartphone into the EMS. If the smartphone or tablet loses reception, the data is saved in the buffer (thanks to EMS Mobile's offline functionality) and automatically sent to the EMS as soon as reception has been restored.

- **Direct portal access**, specially developed for mobile devices, provides the users and energy managers with information at any time and from anywhere. Access rights can be assigned via EMS for each portal and, therefore, to individual energy managers.

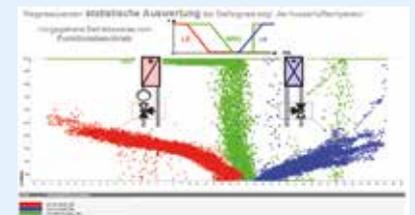
- The third function in EMS Mobile is the **access to ALARMS**. EMS alarms and their various statuses are always available online and can be acknowledged via EMS Mobile.

- The wide range of input options makes SAUTER EMS an extremely flexible and versatile energy management solution. The various connection options via software connectors for different BMS systems and for SQL-based systems, plus the direct connection of meters without BMS, make EMS a completely autonomous product that can be used in buildings as well as in a range of industries and production environments.



## Use as a tool

- In addition to the various ways of presenting the energy consumption levels, EMS provides analysis and monitoring functions, e.g. for assessing the effectiveness of a heat recovery system in detail. In this way, carpet plot and energy signature graphs as a function of supply- and return-air temperatures – as well as valve positions – are important analysis tools which are necessary for any energy manager and energy consultant in addition to the load curve and different KPIs.



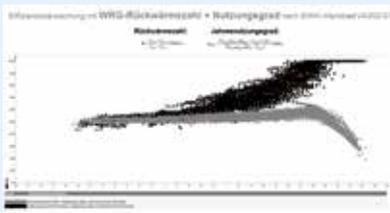
*Evaluation of heat recovery and monitoring of the control sequence as a function of the outside temperature*



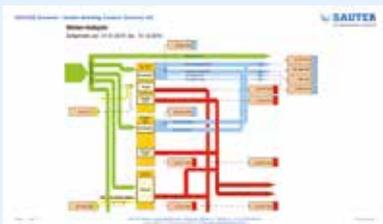
*Energy signature using scatter plots*

## The main advantages of EMS at a glance:

- Standardised reports provide regular information and are available either automatically or at the touch of a button. It is also possible to create dedicated reports based on the customer's requirements. These may be, for instance, energy flow diagrams with the corresponding consumption values or energy performance certificates or the classification of energy consumption within a KPI scale.



Efficiency analysis with heat recovery percentage and degree of utilisation



Energy flow diagram

- + Data acquisition, validation and automatic aggregation to daily, weekly, monthly and yearly values
- + Data acquisition and monitoring of locations and rental areas
- + Various graphic displays, key performance indicators, carpet plot, load curve
- + Key figures such as electricity and heat consumption per area, CO<sub>2</sub> emissions per area etc.
- + Alarm and fault management
- + Manual input of counter values
- + Plausibility checks and rectification
- + Central user administration
- + Languages: German, English, French, Italian and Czech
- + Portal-based standard reports and optional client-specific reports using the BIRT Report Engine
- + Display of graphics on external applications such as the client's website, in a building's entrance area (Green Building Monitor).
- + Logbook function for documentation of, and comments on, incidents
- + Active energy management due to the direct forwarding of defined alarms to the building management system
- + Online access to portals and alarms with browser-optimised display on smartphone or tablet
- + Direct input and transfer of counter values via EMS Mobile to EMS for making manual meter readings more efficient. Furthermore, offline functionality and automatic transfer of data is possible when reception is restored, i.e. it is possible to enter the reading manually offline.
- + Complies with the ISO 50001 requirement to introduce energy management systems, plus various 'green building' certifications such as LEED, BREEAM, DGNB, HQE, Minergie etc.

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## Components

## Services

## Facility Services

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