

Time for energy management – and to improve economic efficiency in buildings.

The operating costs for an intensively-used building can exceed its construction costs even in the second decade of its existence, so there is no doubt that strict control of operating costs can achieve a sustained improvement in economic efficiency. In particular, energy costs – which play such an important part – can be decisively influenced by consistent management.

Sauter's acknowledged expertise in monitoring and assessing the energy efficiency of building management systems can help to prevent 'burning money' unnecessarily in real estate management. Co-operation in this area can range from an on-the-spot analysis of the current situation through to energy contracting over many years.

Analysis of possibilities and costs

Energy management usually starts with a two-stage analysis of the current situation. A rough analysis, which costs the customer nothing, assesses whether it is worth spending any more money at all on the installation. If so, a detailed analysis (for which a charge is made) determines the potential for saving energy. However, this detailed analysis is also free of charge to the customer if it indicates that no significant energy savings can be made with the existing installation.

If savings potential is available, we clarify which type of renewal would pay off for the installation, and over what period of time. The objective here is always to reduce primary energy consumption and emissions of harmful substances (especially CO₂) whilst maintaining comfort in the building. Another decisive factor is compliance with energy regulations, which are playing an increasing part in EU and national legislation.

Regulations make energy management essential

The EU energy-saving directive (EnEV) must be implemented in the national law of all member states. In Germany, the 'energy certificate' will be introduced for this purpose in order to register the energy-relevant data for every building. This certificate has to be produced whenever there is a change of owner or tenant.

Consistent energy management guarantees conformance with key energy values, so the building owner incurs no subsequent expense and protects the environment at the same time.

Energy consumption analysis and comparison with key consumption values

In Germany, standard VDI 3807 specifies characteristic energy values for different types of building. This allows a comparison of the energy consumption for any given building with others of similar types.

These characteristic energy values are used:-

- as initial values for an approximate assessment of energy consumption
- when assessing energy behaviour over several years
- to prompt the introduction of energy-saving measures
- as an operational management and monitoring instrument (energy controlling)
- to monitor energy-saving measures after implementation

Professional experts and modern technology in harmony

Technical energy management involves tasks that can be accomplished only by suitably trained experts with modern control technology. These include:-

- adapting the parameters to the type of use for the building (which may change over time)
- adapting the default values and setpoints
- developing a monitoring system which continuously compares the (occupancy-related) actual values and setpoints, and which triggers an alarm or automatically takes corrective action in case of divergences.

One important energy-saving instrument is the E-MAX software from Sauter which can be used to reduce load peaks. Together with the building operator's staff, our experts draw up a list of suitable consumers for peak load management such as ventilation systems, electrical heaters and refrigeration machines.

No matter what action is taken in each individual case, one thing is always true: planning and implementing effective energy management at the earliest possible stage of the life cycle is always the best way of guaranteeing the economic efficiency of any building.

Combined heat and power plants can optimise energy consumption in hospitals.

Successful examples from Sauter's energy management practice have shown that hospitals above a certain size (about 200 beds) are ideally suitable for the use of combined heat and power plants (CHP), on account of their specific consumption structures for heat and electricity.

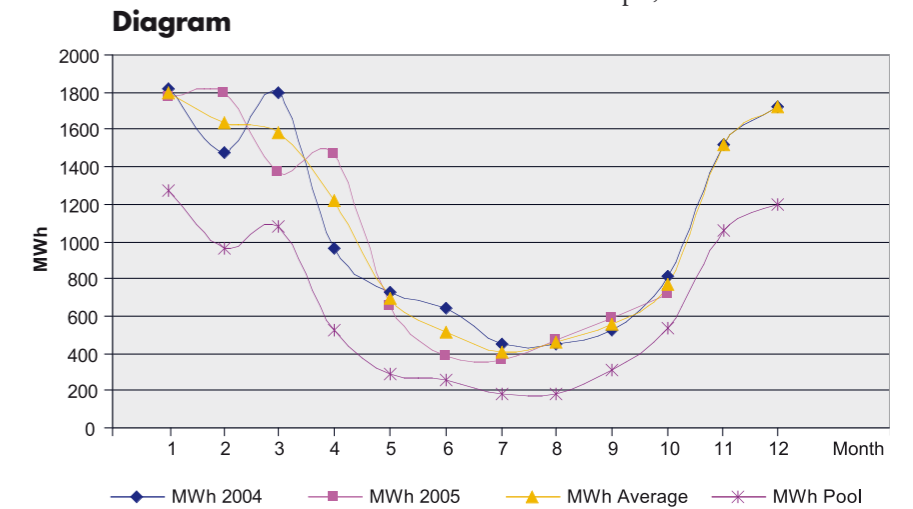
These plants are based on the technical principle of power-heat coupling, i.e. producing power and heat at the same time. A CHP consists of a conventional combustion engine that drives a generator to produce power. The heat lost from the motor and the exhaust gases can be used for heating purposes and to heat drinking water. In summer, when the heating requirement is low, the heat emanating from the CHP can be converted into cooling energy by means of absorption technology.

Natural gas is used as the fuel in most cases, although oil and biogas are among the other possibilities.

The drawback of oil is that large quantities have to be made available because the combined heat and power plant operates for long periods. The price trend also casts doubts over the cost-effectiveness of using oil for heating purposes.

The thermal output of a combined heat and power plant depends on the building's thermal load during summer, when control is heat-led.

As an example, the chart shows the



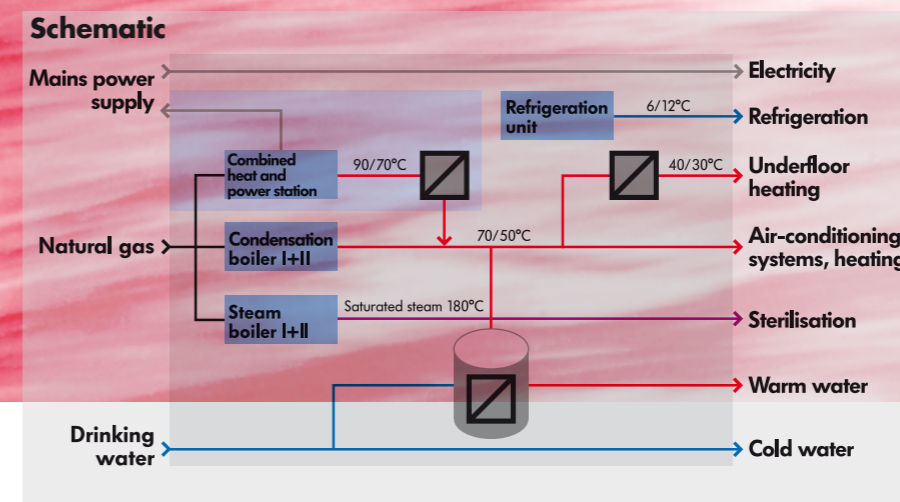
Suitable for constant requirements and long operating periods

The following factors favour the use of a CHP:-

- Simultaneous requirements for heat and power
- Uniform power requirement throughout the year
- Relatively constant basic power load
- All-year heat requirement for water heating
- Continuous cooling/refrigeration requirement

monthly heat consumption of the Western Palatinate Clinic at Kaiserslautern for 2004 and 2005, with the average for the two years. The 'MWh Pool' curve indicates the estimated heat requirement that could be met by a combined heat and power plant. This value is less than the total heat consumption because we assume that the CHP is not able to supply all the heat consumers (partially decentralised supply).

Based on the estimated heat requirement and the assumption that the plant will operate 24 hours a day, we can arrive at a rough approximation of the thermal output: from the energy calculations for 2004 and 2005 and the assumptions stated above, it emerges that a combined heat and power plant with a thermal output of between 300 and 500 kW could be used. The use of storage tanks makes it possible to extend the operating period when the load is low. Very large storage units can also be set up outdoors to help to improve cost-effectiveness.



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