



# Energy efficiency and maintenance

Nowadays, owners of commercial real estate are increasingly active in trying to find possible cost savings for their buildings. Maintenance costs are often placed low on the priority list, but saving on maintenance has a negative effect on energy management. Less maintenance = higher energy consumption.

When the entire life span of a building is taken into consideration, the costs for design and construction amount to between 5 and 10 percent of the total cost. The cost for acquisition, renovation and disposal are responsible for about 5 to 35 percent of the total life cycle cost, whereas the cost for use and maintenance amount to between 60 and 85 percent. Personnel costs amount to 88 percent of the total life cycle cost of the building, use and maintenance cost 11 percent of that and design and construction are responsible for 1 percent.

Thus, the costs for use and maintenance are a significant part of the total life cycle cost of a commercially used building.

## Consumption

Six years ago, it was calculated that in the United States, commercial buildings were responsible

for 71 percent of the total electricity consumption and for 38 percent of the exhaust of carbon dioxide (USGBC 2007). Seventy-five percent of the total energy consumption of commercial real estate is for lighting, heating and cooling. The remaining 25 percent is used for ventilation, cooking, cooling and office equipment (including elevators and telephones).

It is therefore evident that commercial real estate has a major impact on the economy as well as on the environment. That is why it is important to know the details of a building's performance with regard to energy management. Especially in the current economic situation, it is a huge challenge for building owners and managers to not only be advised of these data, but also to be able to proactively manage the consumption and therefore the costs of the use of the building



itself, its processes and its equipment. Collecting this data is not too difficult; any basic Facility Management Information System (FMIS) contains a module that monitors the energy consumption. The challenge then lies in analyzing and interpreting this data. This challenge is increased by the current user situation of the systems applied by the management (energy, climate) of the building. Many buildings still use systems and equipment that is not used optimally or does not even work anymore. In situations like that, it is impossible to acquire accurate information on the entire energy consumption of the building. The causes of unnecessary energy consumption can then not be identified, let alone remedied. The result: needlessly high energy costs for heating and cooling, ventilation and air conditioning, as examples.

### Means

Additional problems are a lack of means to finance an effective maintenance program, an inadequate use of automated maintenance systems and FMIS systems. What is more: many owners and managers still regard their property as a utensil and not as a form of capital investment. Even when an effective energy program is used in a building, but with no effective maintenance program, the performance of the equipment will decrease in the long run, partly because sen-

sors and meters will lose their accuracy due to lack of regular calibrations. In that case, the data regarding the energy consumption will lose their value because they are no longer reliable. However, it was proved (in an American research study in 2009) that a building which is used correctly and has an effective maintenance program in place but is designed badly, still has a better energy performance than a well-designed building that is used badly and has a non-effective maintenance program.

### Proactive

As a result of the economic hard times and the problems in the real estate market, serious cutbacks are made in various sectors. In many cases, the first item on the expenditures list is the personnel (as the most expensive factor) and next in line are maintenance and management of the building. Although many organizations already have an FMIS installed to effectively manage their facilities, too little action is taken (or no action at all) based on what such a system can offer: long-term data on maintenance and proactive maintenance. This can affect the total value of corporate real estate and in the long run, result in considerable costs because, as a result of overdue maintenance, entire installations have to be replaced. This can be interpreted as a







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positive development, as the new installation most likely performs more efficiently than the old one, but if the old installation was far from having to be replaced because it was not yet written off from the books, this boils down to capital loss.

For various reasons, many organizations take residence in smaller buildings or dispose of a part of their real estate because they no longer need it. If the old buildings have no effective and efficient installations, they are even harder to lease or sell. The buildings constructed these days are highly efficient and fitted with state of the art high performance equipment. Older commercial property, partly because they do not have these modern installations, can hardly be sold or leased. This is one of the reasons why there is more and more support to destroy those old buildings. Now that would be a huge capital loss, but a rescue plan could be construed to save a part of all those unused square meters. A major part in this plan could be the renovation of the installations and the integration of solutions that would make the management (maintenance!) and use easier, more environmentally sound – and cheaper. This will entail a huge investment, but in the long run, can interest a user/buyer.

### Subordinate

Energy efficiency is a basic part of sustainability. However, the role played by maintenance in the discussions on energy efficiency is usually subordinate or even totally absent. But without effective maintenance, the energy consumption will become less and less efficient because drive belts will start slipping, ball bearers will wear, and sensors will lose their accuracy.

In view of these challenges, as well as regarding the costs and the impact on the environment of buildings, new tools have to be developed to be able to realize the goals set with regard to energy consumption. This need will increase as more and more demands are made to the design, construction and use (management) of existing corporate real estate that are optimally environment-friendly, climate neutral or even climate positive because they are fitted with installations like solar panels, windmills and such. In that case, maintenance cannot be considered as a separate issue from an effective energy management. ■