AGI ENERGY SERVICE CENTRE
Sustainable Energy for Profitability

ENERGY EFFICIENCY PROJECTS ARE NOT ONLY CHECKING THE ELECTRICAL NETWORK PERFORMANCE!

Commercial and industrial (C&I) electricity consumers would like to reduce their electricity costs. Many of them engage an electrician expert to assess the performance of their electrical network (power factor, distribution losses, etc.). Improving the energy efficiency (EE) of a facility and reducing their electricity costs is not only limited to the electrical network performance. C&I consumers need to engage a professional auditor when developing energy efficiency projects to assess all their consuming departments and systems: compressed air, steam, water cooling, pumping and ventilation, and more generally all production equipment and buildings of the facility.

01 Improving your electrical network performance

Electrical network performance can be analyzed using special measuring devices, so-called power quality analyzers to determine that:

- Utilization of the electrical network is as steady as possible i.e., fluctuations in energy demand and consumption in a facility should be as less as possible;
- As few capacitive or inductive loads as possible should be in the network. In an optimal network, capacitive or inductive loads are balanced, ideally there is a purely ohmic network then. The power factor is 1.00;
- The Load of all three phases is as even as possible. In the case of very unevenly loaded phases, problems arise, including overloading of individual phases;
- As little electrical interference as possible in the network. Many modern electronic devices generate interferences that can be fed back into the power grid. These can be harmonics, power surges, flicker and other disturbances. The more disruptions occur in a network, the greater the risk of problems with the power supply, leading to blackouts.

02 Improving your energy efficiency

Buildings and production facilities can be designed to be efficient or less efficient and can be operated efficiently or less efficiently. This applies to a mobile phone as well as to a steam boiler. Improving energy efficiency means either using more energy-efficient consumers or operating the existing consumers in a more energy-efficient manner. An EE project or an energy audit examines where this is meaningful and/or is economically suitable. First of all, the savings potential must be found, then the corresponding equipment or processes can be optimized.

The energy consumption of consumers is of course very different and therefore the savings potentials in the form of energy, costs and greenhouse gas emissions are very different as well. The idea of tracking all of your electricity expenses may just seem too daunting of a task, to begin with. So, an auditor will classify the consuming equipment and department first and then will deal with the largest consuming ones like steam boilers or compressed air systems and thus applying the Pareto Principle 80/20 Rule.

03 Developing an energy management system

When introducing an energy management system (EnMS)(1), 90% of the energy consumers must be identified. This means that the organization should know where 90% of the energy is used. In most businesses, there are not very many different consumers. In a typical hotel lighting, air conditioning, ventilation, the kitchen and restaurant(s), water pumps for the pool, and hot water heating constitute the major consumption. Everything else, such as bedside lamps, tea kettles or TV sets, usually stay below 10%. The main energy consumers are also called Significant Energy Uses (SEU). If a poor power factor or the network problems cause high additional consumption or problems in the network, these are also SEUs and can be optimized in the framework of an EE project.

(1) An energy management system is a system of computer-aided tools used by operators of facilities to monitor, control, and optimize the performance of the building or the production systems.

04 Identifying your significant energy uses

Depending on the organization, the SEUs can be completely different. While the office computers in a cement plant are negligible, in a call centre they are definitely one of the SEUs. While the vehicle fleet in a hotel is probably a small share only, fuel consumption in a transport company is probably the largest SEU.

An EE project is about finding the individual SEUs of an organization, determining their optimization potentials, and finally improve the efficiency of these SEUs.

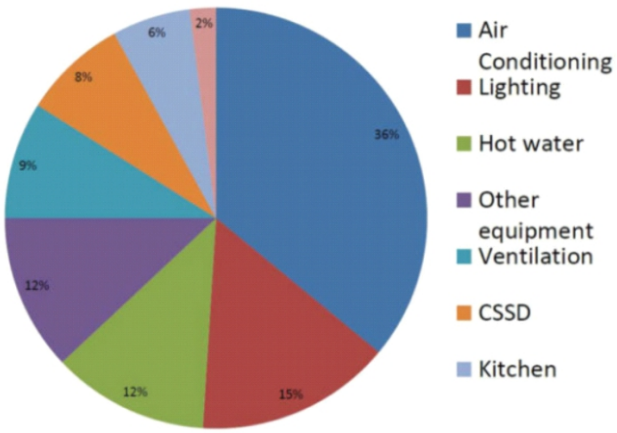

Figure 1 - Example of an energy data measurement and visualization system

05 Conclusion

In order to achieve the highest possible savings in the shortest possible time, C&I companies need to assess the energy efficiency of their significant energy uses and not only the performance of their electrical network.

With many EE measures, however, the savings are not the only criteria, but also, for example, operating reliability, increased production capacity or reduced risk of accidents that are also ways of improving the energy efficiency of a facility. .

For additional information on this opportunity, please contact:

+233 507 977 902
info.esc@agighana.org
www.esc.agighana.org
AGI Energy Service Centre
@agi_energy