Cost Reduction in Building Facility Management

by Ir. Roger Wong

TO achieve a competitive advantage in any enterprise, cost factors and outputs that affect the bottom line must be controlled carefully. Sharply rising energy costs increasingly make energy a cost driver.

One important cost factor is the electricity bill for production, processes, facilities, buildings or infrastructure objects. However, the cost of electricityis only one part – the visible part – of sometimes much higher cost, considering "polluted" and unreliable power. Besides this, the effective usage of production equipment and a reliable energy supply play a major role in cost effectiveness.

The first step in dodging the cost trap for a building facility is to identify the potential cost saving and then to come up with appropriate measures.

HIDDEN COST SAVING POTENTIALS

There area great number of cost-saving potentials in building facility management. One important cost factor is electricity for plant and equipment, buildings and infrastructure. But the electricity bill is merely the immediately noticeable part of costs, which can be much higher when one considers a 'dirty' and unreliable power supply.

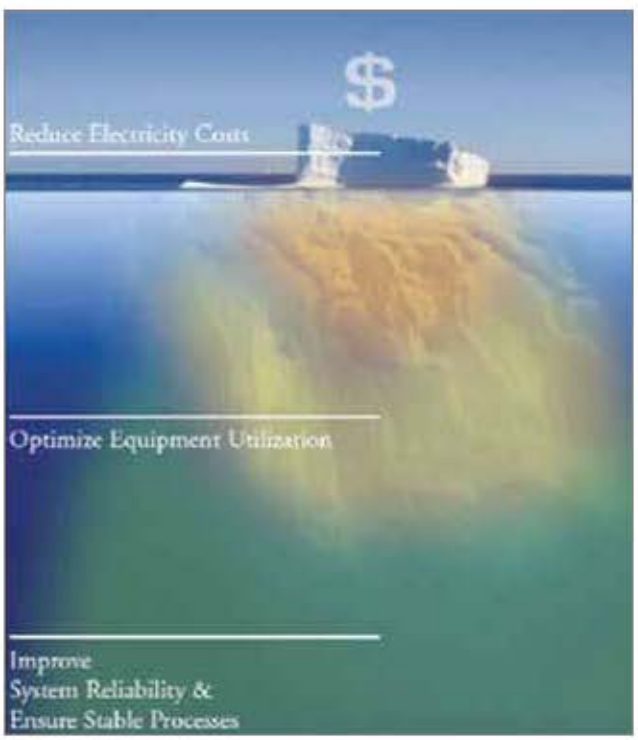
Along with the direct electricity costs, the effective utilisation of power distribution plants and equipment as well as a reliable power supply also play an important role in economic efficiency. As these costs are not as obvious, they are also referred to as 'hidden costs'.

Cost-saving potentials to be achieved from:

- Reducing electricity costs (3-fold):
  - Lowering kWh consumption
  - Reducing reactive power cost (improvement of poor power factor, reduction of penalties)
  - Eliminating demand charges
- Identifying 'energy gluttons'
- Reducing maintenance costs
- Extending the service life of electronic and electrical equipment
- Exact registering of demand per cost centre (e.g. how much electricity is used in which office?)
- Stabilising power supply to prevent computer downtimes
- Taking pro-active measures by means of a higher transparency of the electricity distribution.

REDUCTION OF ELECTRICITY COSTS

Direct, consumption oriented energy costs can be significantly reduced.



Iceberg Analogy
Triple cost saving potential: Hidden cost for under-utilised equipment and unreliable power supply offers tremendous cost-saving potential

1. For property managers, this means improving the precision of the electricity supply sub-billing plus customer-oriented invoicing (cost centre management).
2. Any electrical installation should have a proper energy measurement system. With this in place, any collected data can be used to verify its energy consumption with the power utility. Meanwhile, a good energy management system can also be an excellent tool to forecast energy demand at any time and prevent any installation being penalised by power utility if the energy consumption exceeds its maximum demand.
3. Integrated power management system across the various network levels to help detect uneconomical consumers and energy wastage. Identifying energy wastage is only possible with network transparency and consequently the initiation of corresponding counter-measures.

PEAK LOAD MONITORING HELPS CUT DOWN DEMAND CHARGES

The monitoring of the feeders of incoming transformers of the load profiles and power quality parameters (short-term interruptions, harmonic loading, unbalanced loading, etc...) as well as peak demand supervision is a priority.

By temporarily switching off consumption, e.g. in the canteen kitchen, it is possible to lower the effective power maximum (demand), reduce the demand charges and consequently the electricity bill by up to 20%.

Beside demand charges, peak-load monitoring is helpful in improving the load/utilisation factor of any plant/installation. The load factor of an installation may not be optimised due to an unbalanced or uneven load distribution. Proper or balanced load distribution should be optimised to improve the utilisation of the load.

Knowing the exact power consumption of individual consumers or consumer groups helps in discovering inefficiency electrical loads (consumers) and in initiating counter measures for energy saving.

TRANSPARENCY IN THE DISTRIBUTION SYSTEM HELPS NARROW DOWN ROOT CAUSES

The most important information one gets is due to the achieved transparency of the electricity distribution system. During malfunctions, the selected multi-stage measurement concept across the various network levels proves indispensable in finding the root causes, i.e. for narrowing down the possible sources of faults. For instance, by making a comparison of chronologically synchronised devices, one can find out whether a short-term voltage interruption originated in the network side from the power distribution company or if it is caused by one's own consumers, e.g. through in-rush current caused by capacitor switching or motor start-up or even a short-circuit. ■

Ir. Roger Wong is a technical specialist on the areas of power quality studies, energy audit and electrical energy management. He is currently a Registered Electrical Energy Manager (REEM) registered with Suruhanjaya Tenaga (ST) and he is also a Certified Energy Manager (CEM) registered with ASEAN Energy Management Scheme (AEMAS).