e-Briefing on Energy Efficiency in Industry

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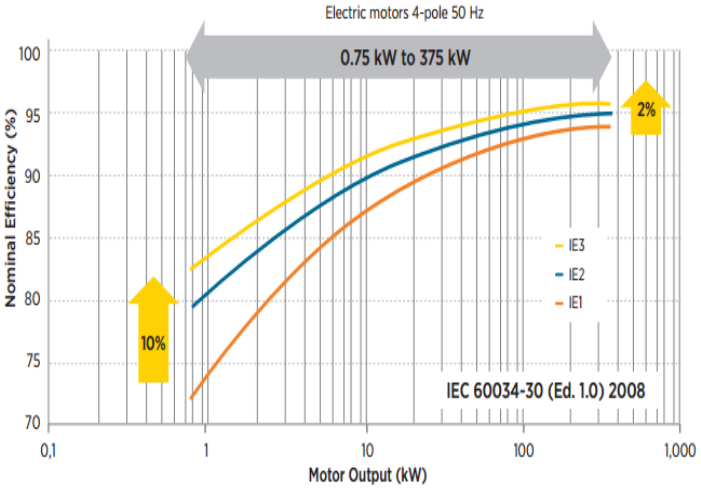
Motors

Electric motors are major users of electricity in industrial plant and commercial premises. Motive power accounts for almost two-thirds of industrial electricity use.

Key Issues

- The low cost of buying a motor can be deceptive. The electricity bill for a motor for just one-month can be more than its purchase price.
- Higher efficiency motors are now available at a reasonable cost premium compared to standard motors (see image for average efficiency improvement of IEC motor classes)
- Just concentrating on the drive itself can mean that significant and often low cost energy saving opportunities in the system can be missed. Critically examine the efficiency of the system being driven and reduce the load on the motor where possible.
- In pump and fan applications, even a small reduction in speed using a Variable Speed Drive (VSD) can produce substantial savings. Also, speed control is a much more energy efficient method of regulating flow than throttles, dampers or re-circulation systems.



Compressed Air

Compressed air is a convenient and often essential utility, widely used in industry.

However, it takes a lot of energy to generate compressed air and is very expensive. For example, it costs up to ten times more to run air tools than their electric equivalent as 90% of the energy used by a compressor is rejected as waste heat.

Key Issues

- Compressed air should only be used where absolutely necessary. Frequently it is used because it's convenient, rather than there being no alternative. Compressed air should not be misused, for example for cleaning or cooling.
- Up to 30% savings are possible by some simple good housekeeping measures, often achievable at no or low cost.
- The level of leaks on a site can be as high as 40%, yet they are often ignored as a source of waste.
- Compressors are frequently left running when not required – even when idling some compressors draw up to 60% of their full load power.
- Poor maintenance is one of the largest causes of poor system performance and wasted energy.
- Producing compressed air at a pressure greater than required, or filtered and dried to unnecessarily high levels is wasteful. Higher pressure means greater losses through leaks and higher power requirement for the same delivered air volume.

Refrigeration Plant

Refrigeration energy is a high cost utility. In certain sectors – notably food & drink, chemicals, food supermarkets and cold storage – it accounts for a significant proportion of overall site energy costs. A small percentage reduction in these refrigeration energy costs can represent huge financial savings. Refrigeration equipment can be divided into 'tailor-made' systems and 'plug-in' appliances. Many refrigeration plants can be improved to save up to 20% of their energy consumption, much of which can be done at little or no cost, with paybacks on investment of well under two years being the norm.

Key Issues

- Is cooling really needed?
- Good housekeeping and maintenance helps ensure efficient and reliable operation.
- Evaporators remove the heat from the cooled space - condensers then reject the heat from the plant to the surroundings. For every 10C fall in evaporator, or 10C rise in condenser temperature increases running costs by 2 to 4%.
- Refrigerant leaks reduce efficiency. Refrigerants also have a significant environmental impact in themselves – it is illegal to knowingly vent them.
- Factor in efficiency considerations to procurement of plant and maintenance services.

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