Powering Uganda

ENERGY SAVING TIPS FOR OUR INDUSTRIAL CUSTOMERS

Why save electricity?

Save electricity: Quite often, Umeme advises its customers to save electricity to reduce on their bills (cost) while at the same time availing the power to more customers that might not have it. The other benefit of power saving minimizes load shedding, reduces pollution and carbon footprint. Below are the benefits of energy saving to our customers, especially the large power users.

Step 1: Assess the energy use of your plants and set a savings goal

Why? Managing energy use is difficult if you are not measuring it. By measuring and tracking, you can evaluate the energy use of your plant(s) and determine a reasonable energy savings goal. This is the first step of an effective energy savings program.

How:

- Assess the current energy performance of your plant.
- Set appropriate goals for your facilities. Example; a simple 10% savings goal for a start.

Step 2: Improve common plant systems

Why? Global estimates indicate that common plant systems use about 80 percent of all industrial energy. It is also possible to reduce energy use in these systems by 10-20 percent. Common plant systems to focus on include:

- Motors and Pumps
- Compressed air
- Steam generation
- Process heating

How:

Uncover opportunities by;

- Evaluating operating practices for waste, unnecessary use, or misuse.
- Operate systems as they were designed and commissioned.
- Proper maintenance of systems to reduce losses.
- Sizing systems for your needs and adjusting them as needs change.
- Recover heat from systems, where possible.

A few specific opportunities include:

- Motors – Use energy efficient products when.
- Rewinding of motors – Maximum 2 times
- Compressed air – Eliminate leaks, inappropriate uses, and verify / reduce system pressure
- Steam – Maintain steam traps, eliminate leaks, insulate and tune up boilers regularly

Step 3: Turn off what is not needed

Why? A common problem in industry is that equipment remains on and running during non-production periods. This results in wasted energy. For many, this practice can be easily adjusted.

How:

- Conduct plant walk-throughs when the plant is down for maintenance.
- Study what is running during these times and determine what can be shut off. (lighting, motors, etc.).
- Establish shut-down procedures that can be implemented by everyone in the plant.
- Periodically review plant adherence to shutdown procedures.

P.T.O for more tips

Step 4: Get employees involved.

Why?
- Employee behavior impacts energy use.
- Employees influence the amount of power required to run equipment, light spaces, etc. However, when informed about the need to save energy and how to do it, generally, employees want to help.
- Promoting energy awareness among employees can provide quick, positive returns for a small, upfront cost.

How:
Hold a special staff meeting to review some basic energy saving behaviors as listed below:
- Educate employees on facility energy use and costs.
- Solicit ideas for energy reduction projects from employees.
- Make employees aware of their responsibilities to manage energy, such as:
  - Turning equipment off when not in use
  - Keeping plant, warehouse or refrigerator doors closed to avoid loss of cooled or tempered air
  - Avoiding improper use of equipment, such as using compressed-air blow down
  - Use Monitor Power Management techniques to make sure computer monitors and computers are placed into sleep mode or turned off after periods of inactivity.

Step 5: Check the lights

Why? In some industries, lighting can use a substantial amount of energy. Look carefully at current lighting systems for efficiency, levels, and controls. Consider upgrading equipment. Perform regular maintenance and make sure lights are turned off when not in use. It is often cost effective with today's technology to replace older lighting systems and save 30 percent or more on lighting expenses. More efficient lighting produces less heat which reduces the need for air conditioning.

How:
- Turn off lights when not in use.
- Maximize the use of task lighting.
- Examine the opportunity for occupancy sensors.
- Evaluate lighting levels.
- Replace older fluorescent lighting with LEDs and consider using fluorescent lighting in high bay applications.
- Replace incandescent bulbs with compact fluorescent bulbs.
- Implement a regular light maintenance schedule.
- Make sure that outdoor lighting is not being used during daylight hours.
- Indoor lighting for security can be accomplished with as few as one out of every ten lighting fixtures.
- Use natural daylight, where possible.

Step 6: Reduce harmonics

Why? Harmonics are unwanted electrical signal generated through a non-linear processes. Solid state Machine drives are a major contributory factor.
Employ harmonic filtering to;
- Reduce heating effects
- Minimize equipment damage

Step 7: Improve power factor

Why? The power that we use at our homes and industry has two components Active Power (MW) which in essence is the power that performs useful work whereas the Reactive Power is power magnetic equipment needs to produce magnetic flux e.g induction motors. These two components constitute what we call Apparent Power (MVA). When a system has a low power factor it implies more current is drawn when compared to that with a high power factor. The ideal figure for good power factor is 1 and that for poor power factor is 0 generally power factor is defined by a number between 0 and 1. A low power factor occurs predominantly in industrial or commercial power consumers especially industrial loads like induction motors, compressors, welding machines, electric furnaces, choke coils and magnetic systems, neon signs and discharge lamps. Industrial loads absorb reactive power from the system hence the need for reactive power compensation the mitigation here is to install capacitor banks which decrease the magnitude of reactive power thereby increasing the power factor.

Disadvantages of low power factor include;
- Increased load to generators, transformers and conductors.
- Increased investments required (Generation, Transmission and Distribution)
- Increased system voltage drops.
- Increased system losses
- Reduced system efficiency
- Reduced system capacity

Benefits of improved Power factor Include;
- Reduced system loses
- Reduced power consumption
- Reduced electricity costs
- Minimised voltage drop on lines
- Improved quality of supply
- Reduced non-productive loading on the system
- Increased system capacity
- Minimised or deferred investments in new generation and transmission lines (energy recovered and returned to the economy of Uganda.

Step 8: Understanding and utilizing the time of use tariff structure to minimize energy costs.

Uganda's tariff structure for commercial & industrial customers is in three time bands namely Shoulder (6am-6pm), Peak (6pm - 12am), Off Peak (12am - 6am). The cost of power per unit is highest during the peak time period and least expensive during the off peak time period. Industrial customers can therefore take advantage of this tariff structure and maximize production during the off peak time period while keeping production at a minimum at the peak time period to reduce their overall expenditure on power.

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