

Industrial Energy Efficiency Project

PIMES CORPORATION, located in the Cavite Economic Zone., was established in 1993 to manufacture various products like medical devices, electronic packages with state of the art assemblies, and parts for testing equipment. PIMES is an OEM-contract manufacturing assembly company. The company offers parts, products, assembly and test services.

Due to the unforgiving tolerances required in producing sensitive products, some of PIMES's manufacturing is carried out in clean room environments.

PIMES Added Value of EnMS and SO



Systems driving improvement

Prior to its involvement with the UNIDO Industrial Energy Efficiency programme, the company was already certified to ISO 9001 and ISO 16949 for Automotive Quality Management System, ISO 14001 for Environmental Management System, OHSAS 18001 for Occupational Health and Safety, as well as ISO 13485 and ISO 17025. The structured implementation and corporate culture of continuous improvement imbedded in the company is aligned with the aims of the Philippine IEE Project (PIEEP) to improve the energy performance of Philippine industry.

As part of the technical assistance provided by the UNIDO Industrial Energy Efficiency programme, International Experts were invited to conduct a review of the organisation's management structure and energy practices.

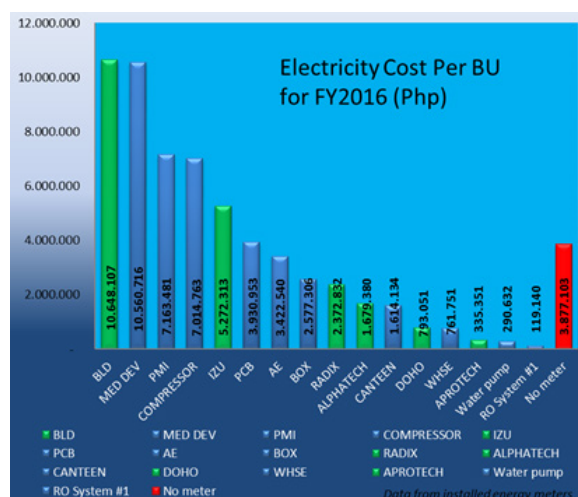
Data - the success factor to effective EnMS

PIMES has recognised that acquiring energy data is a necessary success factor to enabling effective energy management. The company implemented an energy measurement system to effectively understand the energy usage profiles throughout the multiple buildings of the company within factory site. Identification of Significant Energy Users

and development of Energy Performance Indicators (EnPIs) was relatively easy to complete.

The measurement covers almost 90% of all electricity consumption. Using the Pareto, the following four SEUs were identified:

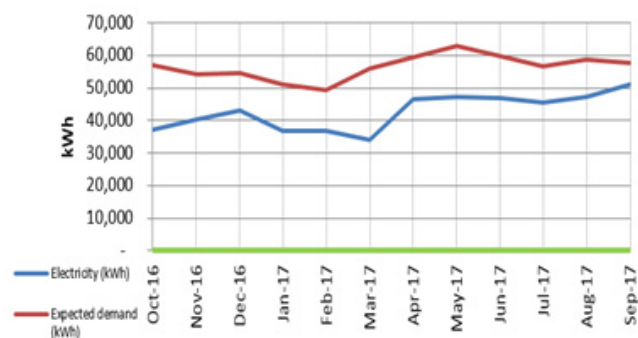
- BLD – 17% usage
- Medical department - 17 % usage
- PMI - 11% usage
- Compressor – 11% usage



EnPIs were developed based on the established data. Some drivers that were responsible for sub-optimal performance in the plan were identified.

The training provided by UNIDO improved the company's capability in developing effective EnPIs. The combination of theory and employment of practical skills enhanced the learning outcomes for PIMES.

Clean room A/B Actual and expected consumption



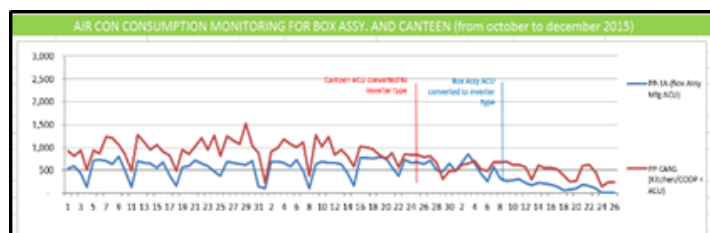
Energy saving opportunities identified by SO

During the implementation of EnMS, the compressor, which was one of the SEUs, was investigated through a system optimization audit, which the plant engineers were also trained to conduct. The following are the ensuing recommendations from this audit:

- Use energy saving nozzles that allow a reduced pressure;
- Fit a regulator after the filter in each individual area to enable pressure reduction;
- Apply zonal isolation to isolated, out-of-production areas to reduce the system leakage;
- Log the amps/kW consumption to determine the load profile;
- Reduce pressure drops through treatment and distribution;
- Detect and correct air leaks.
- Other energy saving opportunities were also identified, some of which are outlined below.
- Replace one conventional AHU units of Cleanroom C/D and A/B to 20HP VRF unit;
- Increase the temperature setting of Cleanroom C/D from 17 to 20 degrees Celsius during the night shift;
- Increase the temperature setting of PCB Assembly Production up to 23 degrees Centigrade if no production is ongoing;
- Replace air-conditioning units of AE Infra Area + COHU + AE Office + AE Cleanroom;
- Replace air-conditioner of Box Assembly Cleanroom to 20HP VRF unit;
- Close off the extension dining area during off-peak hours with a movable partition to reduce demand on air-conditioning.

Measured and verified improvements of SO

One of the initiatives of the SO audit undertaken was to minimize the amount of air leakage. The savings graph below illustrates the use of data to substantiate the energy savings achieved through this.



Another initiative was to replace the conventional AHU units to energy efficient systems. The savings graph below illustrates the use of data to substantiate the energy savings achieved.



This use of data was repeated for all projects to verify the perceived savings and to bind the senior management's commitment to continuous improvement. This use of data makes the request for capital for larger improvements easier to justify as the improvements are verified using the measurement and verification principles outlined in the UNIDO training.

Challenges encountered

The staff initially found it difficult to transform the knowledge of the training into action. The energy monitoring system helped the staff to obtain useful information to manage energy in the facility. Some elements were already in place, but were not recognized because the workers had become accustomed to doing things in such manner. Focus on the significant energy users aided in distilling the correct information to foster effective decision-making by management.

The management representative and the whole energy team of PIMES expressed their appreciation to UNIDO for their support throughout the implementation of the energy management system and for aiding the organisation in continuing to improve their energy performance.

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