UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

Industrial Energy Efficiency Project

Tong Hsing Electronics Phils. Inc. is one of the leading IC Hybrid assembly houses in the country. The company specializes in Chip Scale Package (CSP) Land Grid Array (LGA) or Ball Grid Array (BGA) packages and other devices such as PCB assembly with Surface Mount Technology (SMT) and Chip on Board (COB) processes, Multi Chip Modules especially on RF Modules, Image Products and Ceramic Assembly manufacturing using Thick Film and DPC process.

The facility was established in June 1994 to manufacture various electronic packages with state of the art assembly and test equipment. Manufacturing is carried out in clean room environments that range from class 10, 100, 1000, 10K and 100K depending upon customer requirements.

Tong Hsing EnMS Improvement Journey

Standardization driving improvement

Prior to its involvement with the UNIDO Industrial Energy Efficiency (IEE) programme, the company was certified to ISO 9001 and ISO 16949 for Automotive Quality Management System, ISO 14001 Environmental Management System, and OHSAS 18001 Occupational Health and Safety. This continuous improvement ethos is aligned with the aims of the Philippine IEE Project (PIEEP) that aims to improve energy performance throughout Philippine industry.

The company actively engaged with UNIDO in the program, which included the visit of international experts to review the organization's existing management structure and energy practices.

Data is key to effective EnMS

Tong Hsing recognized that having robust energy data is essential to effective energy management. As such, the company has implemented a strategic energy measurement system to effectively understand the energy usage profiles in both buildings of its plant. This facilitated the identification of Significant Energy Users (SEUs) and the development of Energy Performance Indicators (EnPIs).

The Pareto principle was applied in identifying the top energy users of the company. The top 4 users, which account for 69% of overall energy, were as follows:

1. CDA Plant – 29% usage
2. Chiller Plant – 26% usage
3. Air Handling Units – 11% usage
4. RO Systems – 3% usage

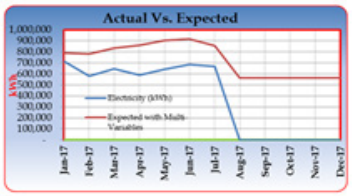
These SEUs were then prioritized based on the calculated opportunity for improvement of each significant energy user. This data was then converted into usable information for the facilities team in the form of EnPIs to identify sub optimal performance in the plant.

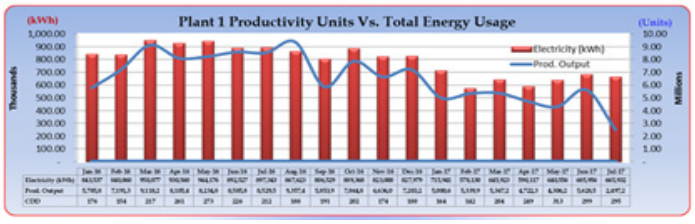
The development of effective EnPIs was facilitated with the training provided by UNIDO through its PIEEP project. The combination of theory and practical deployment of acquired skills was a valuable factor in meeting the learning outcomes for Tong Hsing.

Energy saving opportunities identified

During the implementation of EnMS, several energy saving opportunities were identified, which included:

- Cascading compressed air pressure adjustment based on acceptable pressure;
- Detection and correction of air leaks;
- Quarterly replacement of the air filters;
- Ensuring good system pressure though RO membrane cleaning semi-annually, or as required;
- Installation of VFD for DI water distribution pumps;
- Installation of VFD to AHU3 to address variable space cooling;
- Monthly/Quarterly key utility motor thermal scanning.

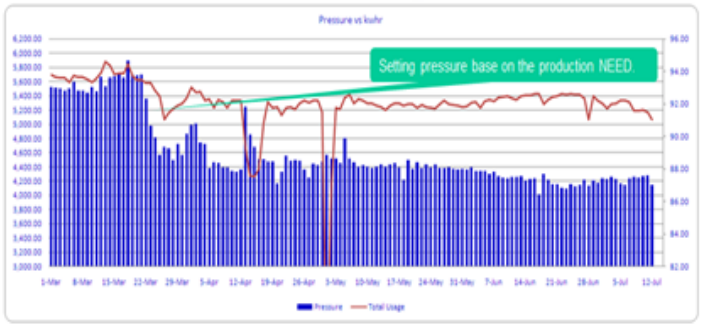




Measured and verified improvements

The initiative to reduce the compressed air pressure to the minimum acceptable level was undertaken in 2017. The savings graph below illustrates the use of data to substantiate the energy savings achieved.

This use of data has been applied in all projects and has become instrumental in guaranteeing the commitment of the company's senior management to continuous improvement. The use of such data facilitated funding requests for larger improvements, as such initiatives can be justified with the use of the measurement and verification principles outlined in the UNIDO training.



Challenges encountered

The staff initially found it difficult to organize the information from the energy monitoring system to obtain useful information for energy management in the facility. There was some difficulty in distinguishing the meters that needed frequent review from the meters that are in place principally to support troubleshooting when significant deviations from planned performance are observed. Focus on the significant energy users was essential to synthesizing the information that is vital to management for effective decision-making.

The management representative for Tong Hsing has extended his appreciation to UNIDO for its valuable support throughout the implementation of the energy management system and for aiding the organization in its continuing effort to improve its energy performance.

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