



Industrial Energy Efficiency Project

San Miguel Yamamura Asia Corporation (SMYAC) is a partnership between the Filipino San Miguel Corporation (SMC) and the Japanese Nihon Yamamura Glass Co. Ltd (NYG). The manufacturing plant, located in the Cavite province of the Philippines, produces glass bottles for the local food and beverage industry.

SMYAC began its commercial operations using a single furnace and three production lines. With an initial capacity of 180 measurement tons per day (MT/D), capacity grew to 465 MT/D in 2007, with the company currently ranking as the largest glass container plant in the country. SMYAC currently has 320 employees in administration and operation.

Glass manufacturing is a highly energy intensive process and with management committed to improving their operations, SMYAC was a natural choice to serve as a pilot plant for the SMYPC group in the Energy Management System (EnMS) programme of the Industrial Energy Efficiency (IEE) project of the United Nations Industrial Development Organization (UNIDO).

SMYAC an example for the whole San Miguel Group

Energy history

SMYAC has been an advocate of energy efficiency initiatives since the establishment of the joint venture between SMC and NYG. From the design of the furnace up to operations and maintenance, the primary consideration was always furnace oil efficiency, with an aim to have the most efficient furnace and consequently be the most energy efficient glass plant in SMYPC. To achieve this, the company already used a specific energy ratio for the entire plant to monitor plant performance, and some energy efficiency initiatives were already in place prior to the EnMS pilot project implementation, such as:

- Replacement of metal halides and fluorescent lamps to compact fluorescent lights (CFLs) and LEDs;
- Installation of inverter-driven centralized air conditioning units;
- Installation of a capacitor bank to the facility's electricity network;
- Variable Speed Drive (VSD) for working end/forehearth combustion and cooling fans;
- Utilization of a double pass regenerative furnace design.

Added value of EnMS system

"The EnMS has led us to manage energy performance more systematically. The uniqueness of this management system such as the execution of in-depth data analysis, identification of SEUs and their drivers, establishment of baseline and new Energy Performance Indices (EnPIs), identification of opportunities and action plans, and application of cost benefit analysis, has provided the organization a quantum leap in managing its energy performance. Through these new approaches, energy efficiency initiatives are now more deliberate, purposive and

calculated." - SMYAC

Furthermore, the analytical skills of energy efficiency practitioners and experts have been raised to a higher level of competency. As a result, sound judgement and comprehensive recommendations can be delivered convincingly to management.

Beyond the improvements in the bottom line through a methodical approach to energy management, the EnMS has enhanced SMYAC's reputation and environmental performance, with the EnMS framework compatible with SMYAC's Environmental Management System (EMS) and Quality Management System (QMS). Within the Operations team, line employee engagement in the energy program has been strengthened by their understanding of their role in the achievement of energy objectives and targets.

Energy targets

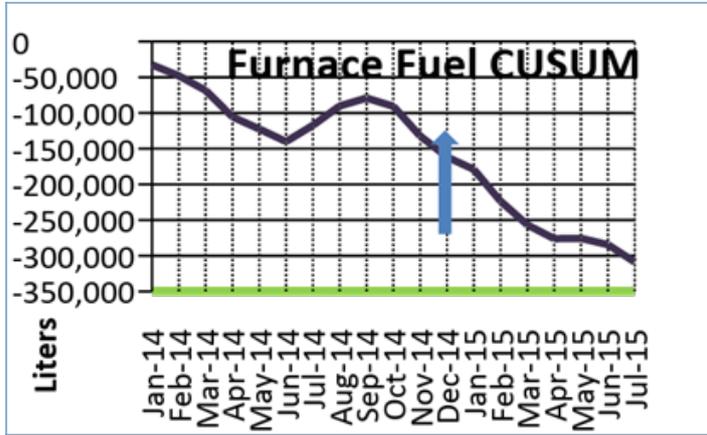
The overall objective for the plant was to achieve a 10.5% reduction of energy consumption within 3 years of implementing EnMS. To help accomplish this, the company set more specific energy reduction targets; to reduce the total energy consumed by the top significant energy users (SEUs) by 1.3%, 4.2% and 5% in 2015, 2016 and 2017, respectively.

Performance improvement

The systematic approach of the EnMS helped SMYAC to focus on their SEUs and the related action plan to reduce energy consumption. Since the involvement of UNIDO and the implementation of EnMS, the company has experienced a significant and consistent decline in their energy consumption, as seen in in the following graphs.

Furnace Fuel

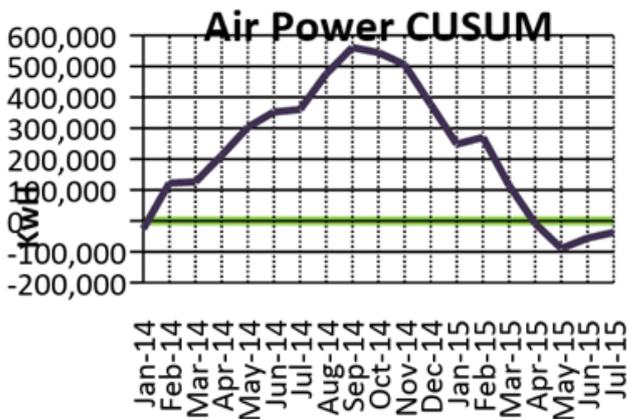
Fuel at the SMYAC plant is consumed only by the furnace. Existing operational controls were improved and more closely adhered to, while new operational controls and actions plans were implemented, such as optimization of furnace temperatures, declogging of the flue system, and sealing of furnaces during the third quarter of 2014. Since then, positive and consistent gains have been recorded.



Air Power

As around 40% of electricity consumption is used by the Compressed Air System - the most significant electricity user at the SMYAC plant – the initial implementation of the EnMS focused here. Operational controls on leak elimination, pressure drop minimization and utilization of bigger compressors yielded an improvement of 598,408 kilowatt-hours (kWh) from October 2014 to July 2015 - around 3.2% of annual air power consumption.

In July 2015, an increase in the air power cumulative sum (CUSUM) was registered as a result of maintenance on the big air compressors. As a result of the analysis, the company now has a significantly better understanding of their energy performance.



Total savings

In comparison to the base year of 2013, SMYAC has saved around 1.4% of total plant energy which is 1.5% of the total energy cost and equivalent to approx. USD 227,000 in annual savings.

Future Steps

Upon seeing the positive results of the EnMS, the SMYAC Glass Business Manager directed the Energy Management Representative (EnMR) to spearhead the establishment of new and common EnPIs for all SMYAC Glass Plants in the Philippines. This initiative provides a great incentive for the implementation of EnMS in other SMYAC Glass Plants in the very near future.

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