

Pilot Project "Introduction to Energy Efficiency and Energy Management Systems in SMEs in Mexico"

Example of energy efficiency improvement Harsco: control system update; improved energy performance promotes quality improvement

Background information:

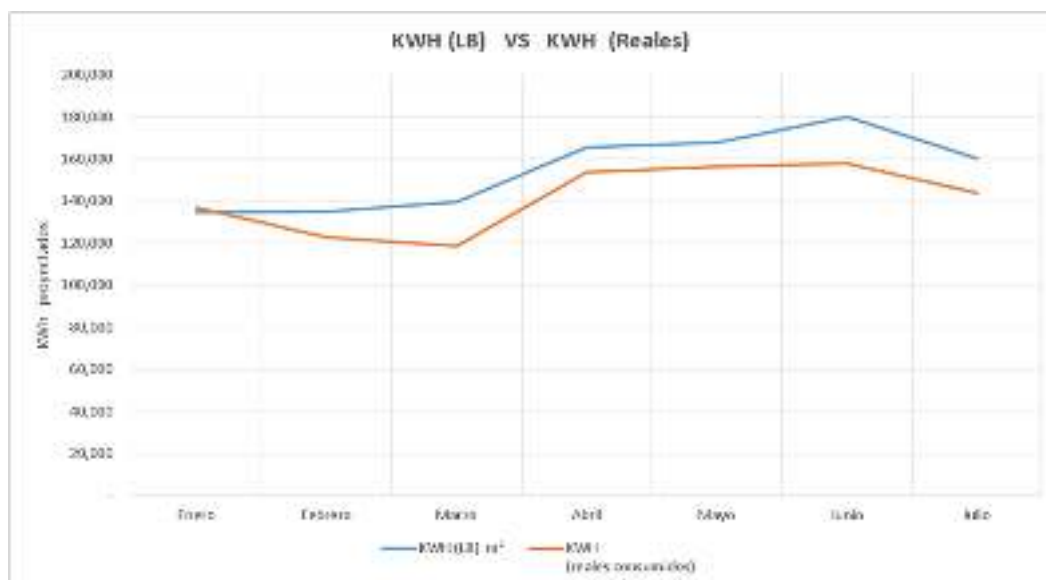
The implementation of the pilot project began with the introductory workshop to ISO 50001 in October 2015. The companies then conducted energy audits to identify and prioritize various opportunities for improvement, under the guidance of Mexican consultants with expertise in energy efficiency.

The products manufactured by **Harsco Industrial IKG de Mexico**, whether grids or fences, are composed mainly of two elements: metal plates and rods, which are overlaid and joined transversely through an electro-forging process that gives the component great strength. Harsco has two electro-forging machines, identified as R-1 and R-2, with different capacities, which are measured in both tons and square metres. These electro-forging machines are controlled by programmable logic controllers (PLCs), which offered poor control of times and quality.

Description of the improvement:

In late 2015, the maintenance department scheduled the reprogramming of the PLC dedicated to the electro forging machine R1 with the aim of optimizing the programmed operation cycle times and those for electro forging, as well as other operating parameters, in order to optimize the operation of that electro forging machine.

Graph comparing actual consumption with the projected baseline for current production using historical data for the year (2015)



PRONASGEN

The Mexican National Commission for the Efficient Use of Energy (CONUEE) and the German Metrology Institute (PTB) make the aforementioned project available to small and medium enterprises (SMEs) in order for them to implement an energy management system (EnMS) according to ISO 50001, by strengthening the skills of technical staff within each company.

For more information on the pilot project, contact Lissette Mendoza Barrón, Tel. 3000 1000 ext. 1318, lissette.mendoza@conuee.gob.mx or Susanne Wendt, susanne.wendt@ptb.de

For this purpose, it was necessary to design an independent industrial system with cutting-edge equipment made by *National Instruments*. This system allows both the operation and monitoring of the system through a touch screen with an easy to use interface. Monitoring can be performed remotely for all the operating parameters of the machine and instantaneous operating values can be obtained. The system also has a feedback loop that enables its operation to be regulated to maintain the operating levels within the desired parameters. This system allows constant monitoring of alternatives in the quest for electrical energy optimization.

Description of non-energy related improvements:

More homogeneous manufacturing of the fences and grids produced (which results in reduced defects and product rejections) and increased productivity in the electro forging machine.

By understanding the variables that affect energy consumption and form the baseline, it was possible to clearly calculate the savings made.

Savings achieved, results and additional benefits

Key indicators	
Improvement in power consumption during the period from January to July 2016	7.3% (79 500 kWh)
Saving in electricity consumption per m ²	17.9%
Saving in electricity consumption per kg	1.1%
Increase in production (January to July 2016)	28.6% (57 422 m ²)
Economic saving for that period	MXN \$ 167 120
Estimated annual saving (2016) on electricity	MXN \$ 286 500
Estimated saving on labour and electricity in 2016	USD \$ 125 000
Investment needed	USD \$ 34 300
Payback period	4 months
Estimated annual saving in greenhouse gas emissions	22.46 t CO ₂