

CASE STUDY: IMPLEMENTATION OF THE ENERGY MANAGEMENT SYSTEM AND SYSTEMS OPTIMIZATION AT COLOMBINA CONFECTIONERY PLANT-1

Industrial Energy Efficiency Programme in Colombia



El futuro
es de todos

Minenergía



ORGANIZACIÓN DE LAS NACIONES UNIDAS
PARA EL DESARROLLO INDUSTRIAL



GLOBAL ENVIRONMENT FACILITY
INVESTING IN OUR PLANET

COLOMBINA company enrolled in the training course offered by EEI Colombia in the coffee belt region during 2017 and 2018, to implement an Energy Management System (EnMS) according to NTC ISO-50001 guidelines, along with the Optimization of Steam and Pumping Systems.



Energy efficiency campaign in Colombina “2018 Energy World Cup”, where incentive compensation was awarded to workers who achieved best results in energy savings.

Source: UNIDO / UPME

“We at COLOMBINA are committed to a sustainability strategy and work to attain a high level of energy efficiency”

Antonio J. Plazas, Chief of General Services, COLOMBINA

Overview:

COLOMBINA is a global food company with production plants located in several regions of Colombia, ranking second in sales of confectionery and chocolate products. The La Paila plant, located in Zarzal, Valle, a producer of candy, chocolate products and snacks among others, was selected for a pilot implementation program of energy efficiency management tools.

The Energy Management System (EnMS) and the tools for systems optimization, were adopted at the company as an initiative to reduce the environmental impact of the plant and to improve the energy performance of the manufacturing processes, whilst contributing with the innovation and sustainability policies of the company.

The production processes of the plant use electric power, natural gas and coal, mainly in motor systems, firing, cooling and pumping applications.

Relevant Information:

Program implemented: EnMS and Optimization of Steam and Pumping Systems

Base year: 2016

Energy sources: Electric power, natural gas and coal

Scope and limits of EnMS:

EnMS: Confectionery (Casting and chocolate products)

Steam Systems Optimization (SSO): General

Pumping Systems Optimization (PSO): Cold water power plant

Improvement actions:

Best practices: O&M, production planning, measuring and control

Technological change (Optimization): variable speed drives, automation

Goal: 8% reduction in consumption of electric power

Identified savings: 274.657 kWh/month of electric power

GHG reduction: 104,4 tCO₂ eq / month

Achievements: _____

The scope for EnMS in Colombina's confectionery plant was focused on candy products, specifically in the consumption of electric power which accounts for 70% of energy used by the manufacturing process. Among the opportunities for improvement that were identified, it is worth highlighting best operational practices, achieved through production planning (Start and stop of machinery), the measurement, control and automation of process variables and preventive maintenance activities that guarantee optimal operation conditions. All these actions represent overall potential savings of 8%.

Steam is an essential energy source for cooking and transportation of raw materials in the plant. The use of computational modeling tools intended for Steam Systems Optimization (SSO) allowed the identification of energy saving opportunities, such as the installation of heat exchangers; better use of waste heat; expanding the coverage of thermal insulation and adjusting the condensate return rate. With all these actions an 11% reduction of the fuel required by boilers is expected.

Pumping Systems Optimization (PSO) tools were additionally used to identify opportunities to save electric power at the cold water power plant. Preventive maintenance activities, automation and control of operations, reconfiguration of pump circuits (Secondary and tertiary), adjusting pump's suction and, in some cases, technological changes were identified in order to optimize the set of pumps at the plant, and to achieve a saving potential of 40%, if compared to the regular power consumption of the plant pumping system.

Success factors and lessons learned: _____

"When searching for ways to reduce energy consumption, it is essential to have a concrete goal regarding energy efficiency, which aligns all possible actions to the attainment of that goal. It is also important to promote such actions through the adoption, publication and divulgation of a public policy. An organization properly committed at all levels has been key in attaining goals set. Energy Efficiency campaigns have provided excellent results in reducing consumption as expected by the company top management; among such campaigns there was a "2018 Energy World Cup", which provided incentives to foster a strong culture of rational and efficient use of energy.

During this World Cup, the "Multipurpose Production" project stood out, as it allows to optimize the production and cutting processes of chocolate products. This methodology was also replicated in other areas of the company, optimizing human resources by dedicating efforts exclusively to one particular productive process, in a product by product basis. When the chocolate product line is operating at full workload, the cutting area does not operate, and vice versa, so only one process is actually using energy and does so in optimal operating conditions. Staff have been trained and have received tools to adapt to all the changes that imply such production planning.

The systematic and continued quest for the alignment of production and energy consumption has also played a fundamental role that starts with periodic, internal audits which allow control over every line of the process, down to the finest detail."

Antonio J. Plazas, Chief of General Services, COLOMBINA

Future actions: _____

Colombina hopes to become ISO 50001 certified in the last quarter of 2019 and to implement EnMS at production plants in Tuluá, Santander de Quilichao, Guatemala and Spain. Colombina also plans investments to implement technological changes that enable energy savings through the "H5 Strategy". This prioritizes the execution of projects with goals set for 5 years, including, of course, projects aiming at fulfilling and improving Colombina's energy performance.

For further information: _____



Eficiencia Energética
Industrial en Colombia

This program, an initiative of UPME and UNIDO, has been created with the purpose of strengthening technical capacities in Energy Efficiency and to foster the implementation of EnMS, as support and contribution to the productivity and competitiveness of the national industry.

United Nations Industrial
Development Organization - UNIDO
M.Matteini@unido.org

Mining and Energy Planning Unit - UPME
www.upme.gov.co
olga.gonzalez@upme.gov.co