

Global Energy Management System Implementation: Case Study

Argentina

Newsan Group

Facilities: Plant 3-4, and 6 (Ushuaia)



Business Case for Energy Management

Organization Profile/Business Case

Newsan Group is one of the most important economic groups in the country. Produces and markets its brands Noblex, ATMA, SIAM, Philco, Sanyo, JVC, Pioneer, Compaq, Braun, Duracell, Revlon and Bosh and Sharp. Also, leading electronics brands such as Huawei, Motorola, Alcatel, Sony, LG and Panasonic choose it as a strategic local partner. In this way, it became the largest Consumer Electronic distribution force in the country. The business of Newsan Electronic is carried out in 6 own industrial plants, located 6 in Ushuaia and 2 in Buenos Aires.

Newsan group includes electrical and electronic facilities located in Ushuaia, Tierra del Fuego. Cellphones, PCB's and microwaves (MWO) are produced in plant 3-4 and air conditioners are produced in plant 6.

Energy efforts are motivated by the company policy, which includes the purpose of making rational use of the energy; and the corporate strategy of extending the integrated management system (the company already had OHSAS 18001:2007, ISO 9001:2008 and ISO

14001:2004 certifications, and has recently updated ISO 9001 and ISO 14001 to its 2015 versions). It's also motivated by economic savings due to increase in price of energy. Besides, it improves the reputation of the company. Prior approach of energy use wasn't associated to any factor. ISO 50001 adoption allowed to rationalize energy consumption based on external factors, such as outdoor temperature; and internal factors, such as level of production.

Case Study Snapshot	
Industry	Newsan group
Product/Service	Electrical and electronic products
Location	Ushuaia
Energy Management System	ISO 50001
Energy Performance Improvement Period	1
Energy Performance Improvement (%) over improvement period	EPI%= 31 for gas energy EPI%= 14 for electricity energy
Total energy cost savings over improvement period	U\$S 367.732
Cost to implement EnMS	U\$S 63.981
Payback period (years) on EnMS implementation	0,17
Total Energy Savings over improvement period	29063 GJ
Total CO ₂ -e emission reduction over improvement period	2620 Metric tons

"It is a challenge for us to think about energy savings, taking into account the extreme temperatures of the region." Facundo Bianciotto, Quality Manager and Operational Manager of EnMS



Boiler piping that distributes hot water for heating in plant 6. Energy source was replaced from packed gas to supplied natural gas



Boiler burner in plant 6. Energy source was replaced from packed gas to supplied natural gas.

Business Benefits Achieved

Business Benefits (Summary)

ISO 50001 implementation adds to the Integrated Management System, which already included ISO 9001, ISO 14001 and OHSAS 18001 certifications. Considering 2016 as the baseline, it allowed to do a rational use of the significant energy sources (electricity and natural gas) and as a consequence, it achieved a cost saving of U\$S 367.732 and a CO₂-e emission reduction of 2620 metric tons.

Newsan Group is the main private employer in Ushuaia, and its actions have a strong impact on the local community. Being an example in terms of energy efficiency promotes a change of habit for the inhabitants of the region. This multiplier effect due to three simple actions (not using more energy than necessary, changing lighting and heating regulation according to the comfort temperature) will undoubtedly help improving energy efficiency and CO₂ emission reduction of the region.

EnMS Development and Implementation

EnMS Development and Implementation is mainly motivated by a new view of the company policy, which promotes a rational and efficient use of the energy in production facilities. Besides, we are working on new technologies to reduce CO₂ emissions and save energy that will be applied soon, such as using pallets biomass to heat one of the facilities.

Organizational

The EnMS was built based on the existing integrated management system structure, which includes ISO 9001, ISO 14001 and OHSAS 18001. This extension of the structure was motivated by the company policy approach, where main leaders commit to promote an efficient use of the energy. Newsan's first certification was achieved in 2015, and the scope was plant 6, where air conditioners are produced. On the next year, it extended its scope to the rest of the sites.

Energy review and planning

Energy consumption & use are considered by identifying all energy sources and evaluating its significance according to the level of consumption. Main energy sources (natural gas and electricity) are reviewed monthly through time. 2016 was established as the baseline for the action plan, which has the following objectives:

Electricity consumption reduction

Goal: Reduce 10% the electricity efficiency indicator

Indicator: Normalized electricity consumption (kwh/standard product hours)

Actions:

- Luminary replacement for low consumption, inside and outside facilities.
- Automatic turning off on production luminary, during lunch breaks and when finishing work shift.
- Awareness campaigns for employees, related to energy saving.

Natural gas consumption reduction

Goal: Reduce 10% the gas efficiency indicator

Indicator: Normalized gas consumption (cubic meters/(comfort temperature-outdoor temperature))

Energy review and planning (continue)

Gas is mainly used for heating. Local weather conditions are determinant for establishing heating requirements in the facilities. A rational use system was established, in which indoor temperature is regulated according to outdoor weather conditions and using pilot mode to avoid consumption when turning on the machine. Besides, in plant 6, energy source was changed from packed gas to supplied natural gas, which is more efficient. Industrial gas was used to clean the working stations, and now is only used for production processes.

It is planned to apply the following actions in 2018: Establish a compressed air leaks detection plan during periods when production activity is stopped.

- Use pallets biomass to heat one of the facilities.
- Split lighting circuits to allow turning on by areas when needed.
- Put electric boards to measure by site.

The action plan is funded with company own resources, and it is implemented through different areas and employees. An external expert helped planning, implementing and evaluating the action plan.

Cost-benefit analysis

Some of the costs to implement EnMS include hiring an external auditor, man-hours of internal staff, external technical advice and training. They were calculated at u\$ 63981. Action plan saved the company u\$ 367732. The payback period is 0,5 years.

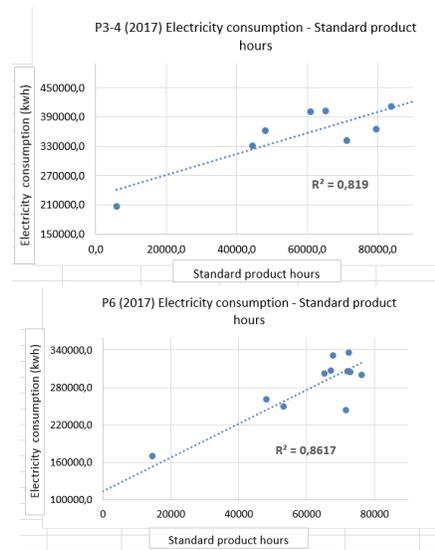
Approach used to determine whether energy performance improved

First step to determine energy performance improvement was to identify all energy sources and evaluate its significance according to the level of consumption. Main energy sources (natural gas and electricity) were selected to review monthly through time. A whole year was chosen as the baseline period, from January to December 2016.

Approach used to determine whether energy performance improved (continue)

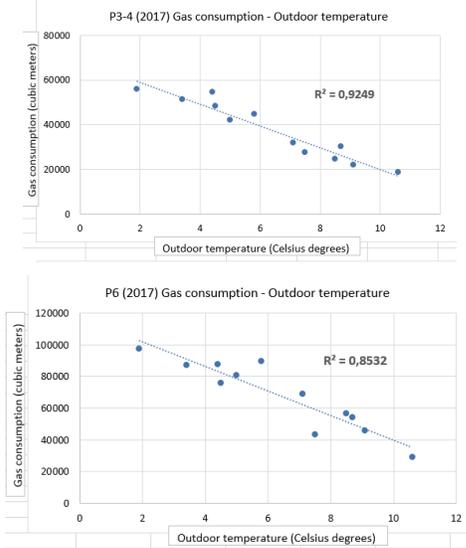
First step to determine energy performance improvement was to identify all energy sources and evaluate its significance according to the level of consumption. Main energy sources (natural gas and electricity) were selected to review monthly through time. A whole year was chosen as the baseline period, from January to December 2016.

Electricity consumption is normalized with standard product hours. They represent man hours spent to generate the amount of product for the established period, and it has turned out to be an important control variable. This was checked by doing regression analysis:

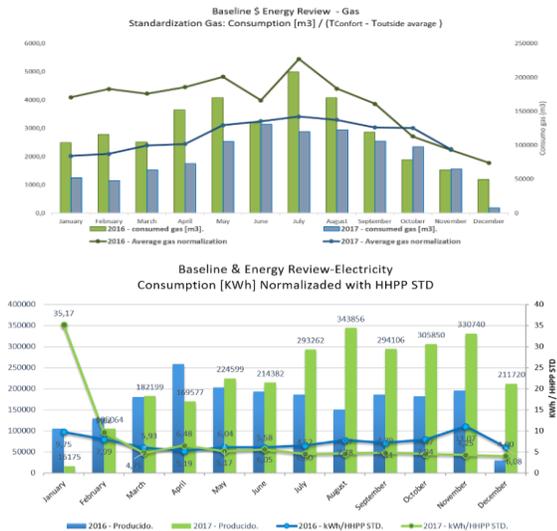


Gas consumption is normalized with difference between outdoor temperature and comfort temperature established to heat the facility, as heating represents the main use of natural gas and it is regulated by weather conditions. This was checked by doing a regression analysis with outdoor temperature. This indicator is the annual average of the monthly values.

Approach used to determine whether energy performance improved (continue)



The energy performance improvement is determined by the annual outcome of both gas and electricity normalized consumptions during the reporting period (2017). It is compared with baseline period (2016) outcome applying the suggested formula (EPI%).



Approach used to validate results

Actual strategy for measuring energy consumption is through measures done by energy suppliers. These measures are provided monthly and updated in comparison charts to analyze consumption trends. Parameters included are gas consumption (cubic meters and kilowatt-hour) and electricity consumption (kilowatt-hour). Evaluation of these measures is done together with the integrated management system audit, once a year.

Steps taken to maintain operational control and sustain energy performance improvement

During 2016-2017 period, main actions were established to achieve energy goals, which have been successful. In alignment with this, staff cultural change was very important. Besides, due to the size of the facilities, luminary change was a significant investment. Other strategic action included regulation of lighting in production areas, which keeps lights on only when necessary. Regarding gas consumption, main actions were change of energy source from packed gas to supplied natural gas and adequacy of heating temperature according to outdoor weather conditions. Both had an important effect due to cultural and economic issues.

"We are surprised to see the impact of the awareness campaign in energy saving, not only within the company but also in the homes of our collaborators" Juliana Mossi, Environmental Management Analyst

Development and use of professional expertise, training, and communications

Since EnMS implementation, several communication campaigns have been carried out for all sectors of the company, including messages through screens inside facilities, leaders and maintenance staff training and suggestion mailbox in dining rooms for internal communication. Regarding audits, an internal employee did the ISO 50001 Energy Management System Internal Auditor Training and an external consultant was hired to prepare the EnMS.

Tools & resources

Main stakeholders were identified to plan actions related to the efficient management of energy. Involving these resources was key to achieve goals. An external consulting allowed to focus on identifying improvement opportunities. An awareness campaign was carried out, as well as a permanent monitoring of consumptions.



Air conditioner production in plant 6, with both types of luminary. Production luminary is turned off during recesses and production stops.



Maintenance employee, regulating an electric board.

Lessons Learned

Lessons Learned / Keyes to Success

- It was important to find key variables that control consumptions, to normalize indicators and focus efforts when establishing action plan.
- Global measurements of consumption do not allow identifying differences in consumption between production lines. It would help to spin finer in the strategies used, by acquiring equipment for measuring or calculating theoretical consumption of each area. This is one of the objectives for next period.

Keys to Success

- Identify those irrational uses of energy that are subject to change through awareness campaigns and cultural changes (turn off the light, comfort temperature).
- Small actions generate big changes: low consumption luminaries.
- The global measurements of the plant do not allow identifying differences in consumption between the production lines. It would help to spin finer in the strategies used and is one of the objectives for next period.

