

Success Story

Company name: Entel Ltd.

Country: Bulgaria

1) Description of the company and energy consumption:



Company Entel is located at 1 ‘Kukush’ street, Sofia, Bulgaria. It produces a wide range of LED lighting products, electronic apparatus for LED lighting and control of lighting systems, and others. The annual sales volume is € 2,756,000. The production area is 4 ha. The major technological processes are: production of different components by machining; installation of electronic components on printing plates; assembling and testing of ready electronic devices, etc. The main technological processes are performed by using lathes, cutting machines, and assembly machines. The company has 141 employees. The energy responsible person is the Chief Power Engineer, who manages a team comprising 5 experts engaged mainly in daily maintenance of all technological and energy equipment. There is not an energy management system in that company.

The company gas and electricity consumption (MWh) before the PINE audit

<i>Electricity consumption</i>	<i>Gas/fuel/heat consumption (specify the type)</i>
3,307.68 MWh	This company uses only electricity

This company has a smaller energy saving potential in comparison to some of the others PINE companies, but it has been chosen as a success story because of the following reasons:

- During the preliminary scouting phase, the company management expressed their long-term readiness to work and collaborate with project partners in the area of energy saving issues. Based on the PINE energy audit, they are developing company standards for energy efficiency for almost all their products, i.e. each item will have a requirement for energy consumption which cannot be exceeded.
- The scouting team, and later the auditing team, both received a very large support by company’s experts during implementation of different PINE stages.
- From now on, the company will purchase only highly energy efficient technological equipment for their production processes.
- The company produces items, which are directly connected with energy saving – LED lighting, electronic drivers for fluorescent and sodium lamps, intelligent control systems for exterior lighting, etc. Their company’s policy promotes such functionality which ensures maximal energy saving. These are all preconditions for saving energy by their clients, and that is the main reason for which the company was selected as a success story from Bulgaria.



2) Description of the activities carried out with the company and the suggested energy savings measures:

During the audit phase, there were three inspections ‘on-the-spot’, and during these visits auditors together with company’s representatives checked all technological processes and energy equipment. The company provided all required data for energy consumption which allowed for identification of energy intensive technological processes and equipment.



Control measurement and record of active power has been carried out on intervals at every hour during two shifts (16 hours) which represent a usual production capacity. The measurement showed maximal and minimal electric power and allowed for identification of potential consumption improvements. Another part of the audit is measuring of electric drives’ loads of different technological units for predefined time intervals. This was needed in order to identify coefficients of utilization and load of the electric drives. This way, we can identify machine idling and poor production organization which leads to irrational use of their production capacities. An analysis of the reactive power compensation as a whole, and for individual technological units has been carried out. The poor reactive power compensation might lead to losses of active power and overloading of power transformers. An analysis of lighting installations in different departments was carried out as well, and a serious energy saving potential was identified. An examination of existing computer configurations was carried out.

Analyzes and measurements showed the following distribution of electricity consumption:

Table 1

Electricity application	Electricity consumption, kWh	Percentage
Lighting	467,880	14.15
Ventilation	118,400	3.58
Drives	2,179,200	65.88
Offices and administration	15,000	0.45
Others	527,200	15.94
Total	3,307,680	100.00

Data from Table 1 show that the main energy saving potential can be found in electric drives, specific equipment (others), and lighting.

Based on the measurements and analyzes carried out, the following energy saving measures have been proposed:

- Electric drives optimization.

It was recommended an electronic system for limiting the idling of all drives which have capacity above 5 kW. For drives with capacity above 7.5 kW, it was recommended frequency inverters operating in “optimal energy consumption” mode. These are contemporary developments in power electronics, which allow for a maximum limitation of unnecessary energy consumption.

- Reconstruction of fluorescent lighting and substitution of the existing conventional (manual) control by an electric control. Automated control of lighting. This measure predicts installation of efficient reflectors for 3,148 fluorescent lighting fixtures and installation of electronic control system. The existing 40 W fluorescent lamps can be gradually substituted by other lamps with lower consumption – 20W. The existing 110 sodium lamps with capacity of 63 W can be replaced by sodium lamps with high pressure – 40W.

Automated control switches on and off lighting and this activity is pre-defined on a year-round schedule and depends on external illumination.

- Periodical switching on and off of workshops' fans. This measure predicts installation of four timers with adjustable "on / off" parameters.
- Setting computers to „Power saving" mode and decrease the number of printers used by connecting the existing devices in LAN. This can reduce the number of printers used by 50%.
- An analysis of the existing specific electronic equipment (others) showed that an economically viable energy optimization does not exist at the moment.



Mr. Todor Terziev, Executive Manager of Entel Ltd., gave his impression of the PINE project: *"The project outcomes are very useful for our company because as a result of the energy audit, we together with the project partners identified a significant energy saving potential. Our company definitely intends to implement the measures proposed within the audit in order to reduce energy consumption and by this way to increase our product competitiveness."*

3) The savings:

The company is currently undergoing an application process under a Bulgarian operational programme for SMEs which provides up to 60% funding of energy efficiency measures. The PINE energy audit is their first energy audit, and it will be used in the future energy saving activities. The measures described in the energy audit report have been approved by company's management and they expressed their willingness to implement all approved measures within the next three years.

Energy savings achieved after the implementation of the measures proposed by the PINE auditor.

	<i>Electricity savings</i>	<i>Gas/fuel/ heat savings (specify the type)</i>
<i>Actual saving:</i>	<i>none</i>	<i>This company uses only electricity</i>
<i>Future saving (in 3 years (annual)):</i>	<i>292,810 kWh</i>	

