
**SAVING ENERGY IN INDUSTRY:
MONITORING & TARGETING ENERGY MANAGEMENT (M&T)**

Reducing Energy Cost through Monitoring & Targeting Energy Management: -The Case of Tema Lube Oil Company Ltd.



The bottling line at Tema Lube Oil Company

Summary

The cost of energy in Ghana has increased significantly in recent times, prompting consumers to look for opportunities to reduce the cost of production in order to stay competitive on the market.

Monitoring & Targeting Energy management, under which energy consumption is monitored and compared with output, has been introduced to industries in Ghana since 1997.

The Tema Lube Oil Company is one of 10 companies that benefited from a pilot scheme that was introduced in Ghana with financial assistance from the International Development

Association (IDA) under the Ghana Thermal Power Project, which was initiated in 1995. A total of US\$7,034 was invested in purchasing and installing metering systems and equipment to improve power factor and training of technical staff in energy management. Consequently the Energy Management Team at TLOC has achieved laudable success in the control of energy costs. By regularly monitoring their energy performance against set targets, TLOC has recorded 35% reduction in energy costs to the tune of #40million (US\$10,000) in 1999.

Case Study Objective:

The objective of this case study is to demonstrate to industrial managers that good energy management practices can yield significant benefits and improve competitiveness.

Potential Users

This case study is intended for all types of industries, particularly the small and medium scale industries. Industrial managers and engineers would find this case study as a useful guide for the introduction of formal energy management programmes in their companies.

Introduction

The Energy Foundation has for the past years been promoting energy management and conservation measures in the industrial sector. The aim is to create awareness of the benefits derived from good housekeeping and energy management practices, monitoring and targeting of energy and the savings achieved.

The Tema Lube Oil Company Ltd. is one of 10 companies where the Energy Foundation has implemented a pilot Monitoring and Targeting Energy Management Scheme to improve energy management.



Filling steel drums with lube oil

Background

The Tema Lube Oil Company Ltd. (TLOC) was established in 1990 as a

private company through the collaboration of the Ministry of Mines and Energy, AGIP Petrolli and the Oil Marketing Companies that operate in Ghana. The Company's factory located at the Tema light industrial area, produces lubricating oils of various grades for use in vehicles and for mining and industrial applications. TLOC also manufactures plastic containers and steel drums on site, for its products. Currently the factory employs 75 workers, and produces 30 million litres of lube oil and 160,000 steel drums per annum, operating at about 80% capacity.

At TLOC lubricating oil is produced by mixing base oils and additives. Blending is done by batch mixing in special vessels. The finished products are then shipped to the Oil Marketing Companies in one litre, four litre and five litre containers, drums, and bulk tankers.

Energy Use

Electricity is used mainly for running pumps, an electric oven for heating the additives before blending, and for running various electric motors at the plant. The company's maximum electric power demand is 400 kVA. Liquefied Petroleum Gas (LPG) is used as boiler fuel and for cooking in the staff canteen. About 750 kg of LPG is consumed each month.

Energy Management

As part of TLOCs strategy to keep operating costs under control by utilising production inputs efficiently, a formal energy management structure was put in place. The Plant Engineer, Ing. D.Y. Bando together with the Maintenance Superintendent, Mr. Reginald Quist, who has the additional responsibility as the Energy Manager, form the core of the energy management team. The team monitors closely energy use pattern at the plant in relation to production output and makes recommendations for action to improve efficiency.

To facilitate the energy management function, the company, with technical support from the Ministry of Mines & Energy and the Energy Foundation, installed an Energy Monitoring and Targeting (M&T) System to monitor and assist management to manage the energy resources available to the company.

This involved the demarcation of the company into smaller Energy Account Centres (EAC). Separate energy meters were installed at each of the EACs. Weekly data on energy consumption and output for each individual EAC are collected and analysed, using an

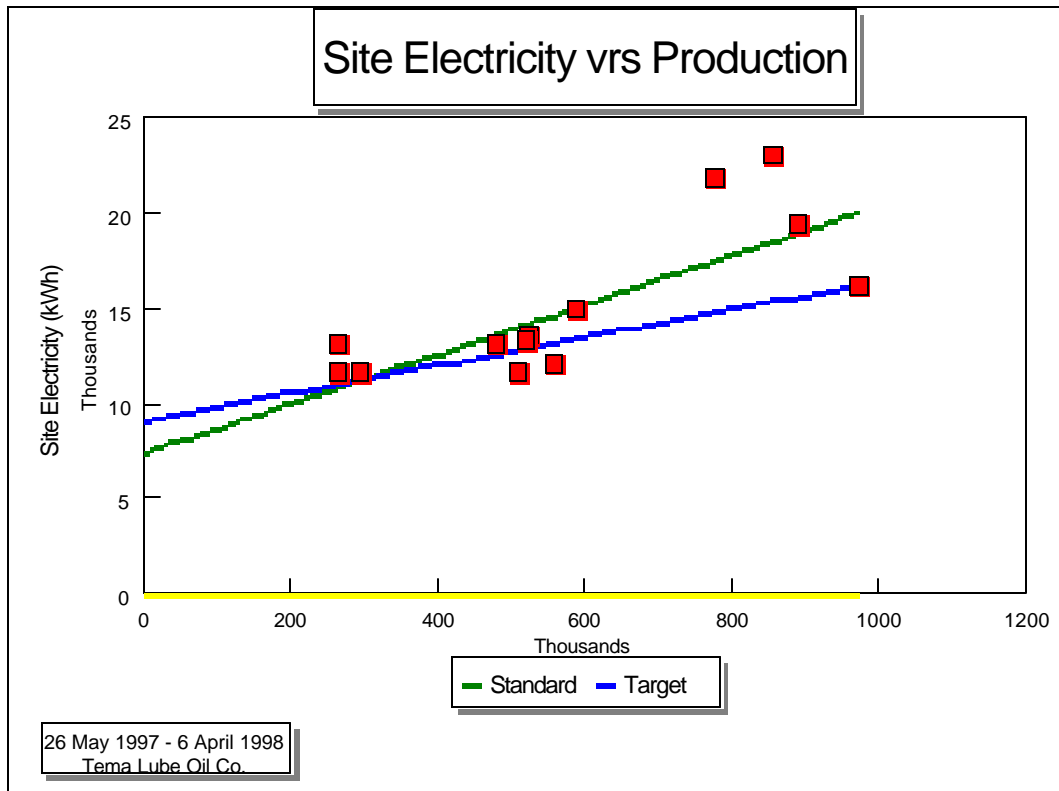
energy management software provided by the Ministry of Mines & Energy. The use of the software enables early

an analysis of production output and energy consumption for an Energy Account Centre, for various production levels. The green line shows the standard performance. The actual performance is compared with the target (and standard). The Energy Manager submits regular reports on energy use to management, and discusses trends with sectional managers with the view of assisting them to take corrective measures.

Energy Cost Savings Achieved

The Energy Management Team at TLOC has achieved laudable success in the control of energy costs. By regularly monitoring their energy performance against set targets it was possible to identify cost effective measures to improve efficiency.

Some notable energy saving measures that were implemented include training of staff in Demand Side Management



detection of efficiency losses for prompt corrective action to be taken.

The diagram above shows a target (blue line), which has been set through

techniques, training in efficient boiler operations and the installation of a 200 kVAR capacitor bank which improved the factory's power factor from 0.75 to

0.95. The company has also installed an electronic scale conditioner (scale blaster) recently on the boiler to minimise scaling and save on heating costs.

Results:

These measures have resulted in a 35% reduction in the company's electricity bills representing an annual cost savings of #40 million.

Investment Cost

The cost of the M&T system was US\$2,434 for the procurement and installation of meters. In addition, US\$4,600 was spent on training and power factor correction.



Taking weekly energy meter readings

Payback period

Annual Savings is US\$10,000(@ exchange rate of US\$= #4,000)
Investment Cost = \$7,034
Simple Payback period is therefore 9 months.



Tank Farm at TLOC

Conclusion

Energy Monitoring and Targeting is an effective energy management tool and has been effective in reducing the cost of energy at TLOC. With the expected increases in energy costs, particularly electricity tariffs, the programme is expected to yield higher cost savings, thus improving the company's profitability. The results achieved by TLOC demonstrate that energy costs in industry and commercial firms can be managed to yield tangible benefits in terms of reduced cost and improved competitiveness.

The Plant Engineer, Mr.D.Y. Bandoh had the following to say:

"We at TLOC consider energy management as the responsibility of all energy users, be it domestic or industrial. The benefits are enormous to the customer, society and the utility provider. We have been achieving success in energy management since 1995. We embarked on vigorous energy efficiency measures, including de-lamping, proper insulation of heating and cooling systems, staff education, power factor correction and load management. By this we have achieved consistency in energy usage as against production output. We are grateful to the Energy Foundation for their support to TLOC in achieving success in energy efficiency."

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