# Energy Management System Implementation

## Raymond Limited, Jalgaon Unit

*– Mr. Sanjay Bokare(Dy.GM Engg.), Raymond Limited, Jalgaon Unit*

### Introducing the Plant

The Jalgaon Division of Raymond Ltd. was established in 1979 with a manufacturing capacity of 79 lakh meters per annum, of worsted suiting. The worsted division manufactures worsted suiting fabric with polyester-wool and polyester-viscose blends.

### Strategies adopted for implementing ISO 50001, Energy Management System

**Development phase**

- The top management is committed to establishing the EnMS system because of its direct effect on operation costs. This is encouraged by providing separate funds, and involving the heads of each department, who decide issues related to EnMS implementation and use available resources.
- An energy team was formed comprising young and energetic members together with experienced members. Each team member's responsibility was clearly defined, as were timelines.
- The team identified current energy sources, evaluated past and present energy use and consumption. Based on this, analysis areas of significant energy use were identified. Also identified were the facilities, equipment, systems, processes and personnel working for, or on behalf of, the organization that significantly affect energy use and consumption. Other relevant variables affecting energy use significantly were also identified.
- Estimates of future energy use and consumption were also drawn up; opportunities for improving energy performance were identified, priorities listed and recorded. Based upon the energy review, an energy baseline for each SEU was set as was also a target for each department.

**Use of Professional Experience:**

A professional was hired to guide personnel and implement EnMS 50001. He provided training customized to the level of the employee and made them aware of the EnMS system and how to implement it. An Idea Box has been set up in every department to collect suggestions from shop floor workers, with the best suggestion of the month being awarded, so as to encourage the workmen. At middle level, there is a monthly meeting to assess whether the EnMS system has been implemented effectively.

**Tools and resources**

The plant was guided by a BEE-certified energy auditor. Help was sought from external experts to implement ISO 50002:2014, ISO 50003:2014, and ISO 50004:2014. ISO 14001:2008 was a very handy tool in the implementation of the EnMS system.

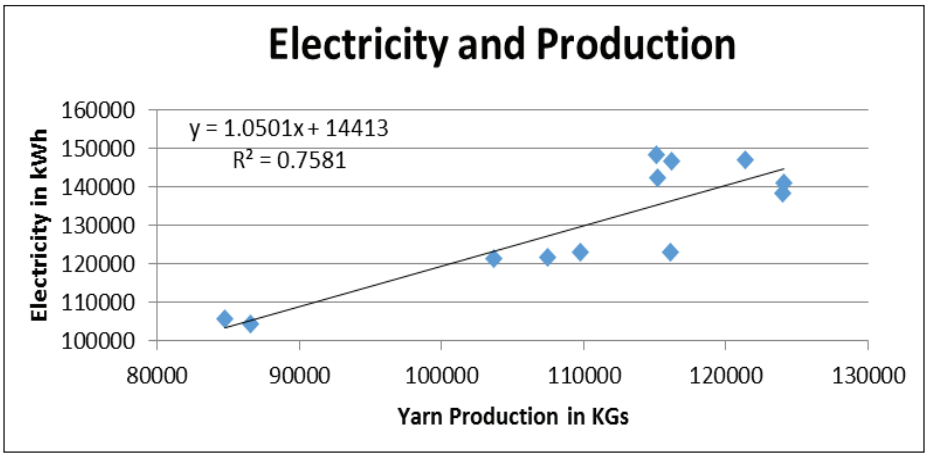
### Steps taken to maintain operational control and sustain energy performance improvement

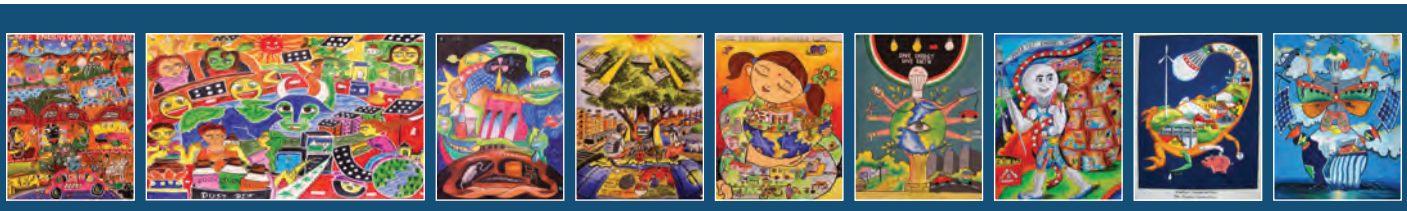
The plant listed some Critical Operating Parameters (COPs) for each department and monitor these parameters continuously; the COPs are prominently displayed in each department. Specific consumption in the plant was monitored each day.

Approach used to: 1) determine whether energy performance improved, and, 2) to validate results

1. Monitoring of specific energy consumption of each department.
2. Monitoring of plant's monthly power consumption.
3. Monitoring of efficiency and machine utilization.
4. Measurement of power consumption using energy meters installed in each area.
5. Recording of daily production.

**Figure 1: Electricity and Production in the plant**



| Table 1: Analysis of Actual v/s Expected and Target Saving | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Month | UOM | Apr-15 | May-15 | Jun-15 | Jul-15 | Aug-15 | Sep-15 | Oct-15 | Nov-15 | Dec-15 | Jan-16 | Feb-16 |
| Actual | Electricity | kWh/month | 189399 | 193937 | 199101 | 210850 | 120750 | 96510 | 103524 | 82843 | 110501 | 102777 | 0 |
| | Production | Kgs | 129991 | 118895 | 115672 | 128843 | 122189 | 111384 | 125037 | 95046 | 127049 | 120287 | 0 |
| | Var 1 | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | Var 2 | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | Var 3 | | | | | | | | | | | | |
| Expected | consumption | kWh | 150923 | 139270 | 135886 | 149717 | 142729 | 131383 | 145720 | 114225 | 147833 | 140732 | 14413 |
| Savings | Actual | kWh/Month | -38476 | -54667 | -63215 | -61133 | 21979 | 34873 | 42196 | 31382 | 37332 | 37955 | 14413 |
| | Cumulative | kWh | -38476 | -93143 | -156359 | -217491 | -195512 | -160639 | -118443 | -87061 | -49729 | -11773 | 2640 |
| Target | consumption | kWh | 149413 | 137878 | 134527 | 148220 | 141302 | 130069 | 144263 | 113083 | 146355 | 139325 | 14269 |
| | savings | kWh/month | -39986 | -56060 | -64574 | -62630 | 20552 | 33559 | 40739 | 30240 | 35854 | 36548 | 14269 |
| | savings CUSUM | kWh | -39986 | -96045 | -160619 | -223249 | -202697 | -169138 | -128400 | -98160 | -62306 | -25757 | -11488 |
| | % Variance | | -25 | -39 | -47 | -41 | 15 | 27 | 29 | 27 | 25 | 27 | 100 |

**Cost-benefit analysis:**

| | Project | Annual energy savings (kWh) | Annual savings (lacs) | Initial cost (lacs) | Payback in months |
|---|---|---|---|---|---|
| 1 | Converting chiller plant into normal humidification plant | 120000 | 10.2 | 30 | 35.29 |
| 2 | Replacing 10 TPH boiler into 6 TPH boiler | 208 tonnes of coal | 52 | 60 | 13.85 |
| 3 | Installing VFDs in treated water pump | 17184 | 1.46 | 1 | 8.22 |
| 4 | Replacing fluid coupling motor with energy-efficient motor along with drive | 8592 | 0.73 | 1.5 | 24.65 |
| 5 | Replacing conventional tubelights with LEDs | 661305.6 | 56.21 | 21 | 4.48 |

**Lessons Learned**

1. Energy cost is playing very vital role in manufacturing process.so we need to use energy efficiently.
2. Use of Energy efficient equipment should be our focus.

## Team of Innovators

The team behind the successful implementation of the project were Mr. Bhupender Rajput (Dy. Manager), Mr. Milan Rana (Executive), Mr. Inder Pal Singh Kohli (Executive) and Narendra singh Rathore (Executive).

**Mr. Sanjay Sharan**
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ISO 50001 is a very handy tool to reduce production cost by implementing various energy measures.

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