

# Global Energy Management System Implementation: Case Study

India

## Raymond Limited

Textile Division, Chhindwara



National Energy Conservation Day 2015

### Energy Management System Overview

The Raymond Ltd. Textile Division, Chhindwara recognizes that the uncontrolled consumption of energy can have a negative impact on the environment and on business performance. A company commitment to follow this policy is at the core of Raymond Ltd. Chhindwara's energy management system (EnMS). We successfully implemented an energy management system (EnMS) that meets all requirements of ISO 50001.

Led by a cross-functional team that includes a range of employees and managers, the EnMS focuses on continuous improvement to ensure that energy is managed efficiently. Cost-effective measures are employed to deliver ongoing improvements in energy performance. The EnMS assesses and

prioritizes all proposed energy-saving measures by using the same criteria used for other investments.

*"Saving energy not only saves money but also saves our limited and valuable natural resources used to produce it."*

- Mr. Vinod Padmanabhan, unit head at Raymond Ltd. Chhindwara.

### Case Study Snapshot

Industry	Textile
Location	Chhindwara
Energy Management System	ISO 50001
Product/Service	Wool based fabric
Energy Performance Improvement (%)	9.81% reduction during 1 <sup>st</sup> PAT cycle.
Annual energy cost savings	Rs. 2,550,000
Cost to implement	Rs. 2,440,000
Products	Polyester, wool, Polyester wool blended suiting and shirting fabrics.
Employees	3100 to 3300
Energy sources	Coal, Steam, LPG, Electricity, Diesel

Energy-saving goals are set by management and monitored monthly. Energy performance

indicators are reviewed annually. Employees are encouraged to submit energy saving ideas.

*“Energy conservation should not only be practiced at organizational level but should also be exercised at a personal level.”*

– Mr. Jayant Joshi, General Manager (Engg.)

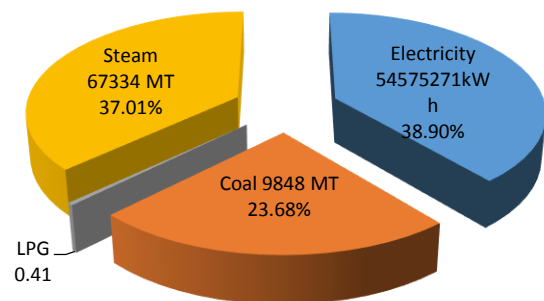
### Business Case for Energy Management

The Raymond Chhindwara plant received many awards for energy conservation from the Govt. of India under the banner “National Energy Conservation Awards”. The attention of the management on energy, its conservation and its preservation have always been high, it can be noted through our various energy conservation measures since 1999 resulting in getting various energy conservation awards.

### Company Profile

Incorporated in 1925, **Raymond Limited** presently has five divisions comprising of Textiles, Denim, Engineering Files & Tools, Aviation, Designer Wear, and Prophylactics and Toiletries. With a capacity of 45.28 Million Meters in wool & wool-blended fabrics, Raymond commands over 60% market share in worsted suiting in India and ranks amongst the first three fully integrated manufacturers of worsted suiting in the world.

The Chhindwara Unit is one of the three production units of the Textile Division. The installed capacity of Chhindwara unit is 128 looms and 33528 spindles as against the license capacity of 1500 looms and 50000 spindles. The unit has a work force of more than 2900. The plant is located on a 100 acre plot with a built-up area of 140,000 sq meters and a green belt area of 65%. The plant is well equipped with the most modern machinery, ensuring high efficiency and productivity. The work force is adequately skilled, well trained and competent. This unit became operational in the year 1991. A well-equipped in-house laboratory is maintained for carrying out the various quality tests of in-coming, in-process and the final products.



**% of Types of Energy Used**

Raymond Chhindwara is also identified a Designated Consumer (DC) as per the norms laid down by the Ministry of Power under the Perform Achieve Trade (PAT) scheme and hence compliance to this scheme was made a mandatory requirement. Under this scheme the plant was given the target to reduced its consumption by 4% by employing energy saving / conservation measures in its 1<sup>st</sup> cycle i.e. during April 2012- March 2015.

To boost facility energy efficiency, the plant resolved to install more efficient equipment and implement an ISO 50001-compliant EnMS. The EnMS has proven extremely useful in managing the plant's energy resources. Managing energy resources ultimately helps to reduce plant costs. Raymond being a leader in Indian textile industry, achieving ISO 50001 was a matter of great pride and reputation.

## Keys to Success

- A well suited system / method for timely data collection and measurements of energy consumption inside the plant boundary.
- Energy awareness amongst the people working in the plant is must because no system/process/method can be brought into practice without knowing the actual significance and need for it.
- Good computer operating skills of our members came in handy as it is required to use some mathematical tools in MS excel for EnPI measurement and analysis.
- ISO implementation guides, ISO 50002, 50003, 50004 & 50006 provided a more clear idea about the interpretation and meaning of the EnMS standard and its requirement.
- A well-documented EnMS manual with all the necessary procedures and action plans makes it a lot easier to manage and implement the energy management system and also to share the responsibilities accordingly.



**LED tube lights at Worsted spinning Department.**



**Installation of inverters in place of star delta starter**

**EnMS Development and Implementation**

**Business Benefits**

The Raymond Chhindwara plant’s achievements in energy management range from lighting control projects to replacement of conventional star-delta / DOL starters with VFD’s and soft starters. Also, the old lower efficiency class motors were replaced to IE2 high efficiency class which will be giving an estimated saving of 2.55 million rupees in the year 2015-2016.

The plant achieved ISO 50001 certification and has a well-established energy management system that encourages continual improvement practices. The plant’s energy resources are now proactively managed via a rigorous business system to sustain those energy savings and continue strengthening plant energy performance in the future.

**Organizational**

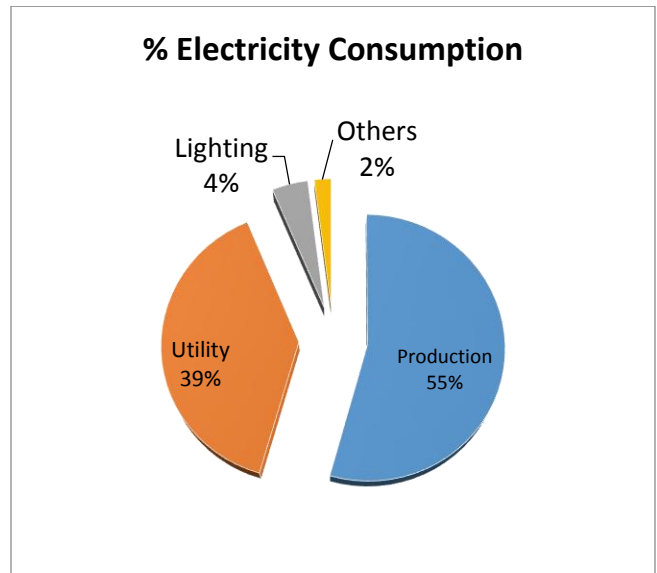
Top management was highly committed towards implementing EnMS and hence a Management Representative was appointed with immediate effect. All the powers to make decisions regarding the EnMS were conferred to the MR and he was also made responsible to assign roles and responsibilities to the other members of the organization.

The major resource was a team which comprised of 15 experienced and dedicated members from all over the plant, specialists of their respective roles. This team was hence called the Energy Management Team (EMT) with MR as their leader.

**Energy Review and Planning**

With a well-organized process of data collection and measurement, consumption details of various departments were readily available which lead to a systematic approach to understand the energy use. This data availability enabled us to study the past trend of our consumption and finally a baseline was reached i.e financial year 2014-2015.

Analysis of the present details led us to the fact that majority energy consumption in our unit is in the form of electricity. Hence, monthly electricity consumption for all departments was made separately and their annual total was determined. Based on this fact, the significant energy use (SEU) areas were determined considering a threshold of 5% electric use of the total consumption. Furthermore, for each department their EnPI’s were realized considering their unit of production and consumption and a ratio of energy per unit of production was discussed and found suitable to be an EnPI.



**Development and use of professional expertise and operational control**

To have a well defined and functional energy management system, the members of the organization are to develop a sense of consciousness about energy consumption, conservation and wastage, an awareness about the significance of our energy sources needs to be given to the people of the organization.

We at Raymond Chhindwara Ltd. identified and made a list of the training levels to be imparted to the personnel’s according to their job profiles. The key role for EnMS implementation was to be played by the MR and the EMT, hence specialized trainings from BEE certified external experts was arranged on EnMS implementation and internal auditor training. These members were then

responsible to again train the other staff members in their respective department. A number of trainings were arranged on awareness for ground level workers working in the SEU area, their role in energy conservation and preservation was the most because they were the 1<sup>st</sup> in line to work on the machines.

Communication set up was very lucid, as each and every detail / update on EnMS was circulated to all the concerned personnel's through e-mail and all the latest documents, records and data was put up on the intranet and was accessible to all the staff members. Workers were intimated for any progress by putting up notices on the notice board. In the due process a proper control was maintained throughout by password protecting all the relevant documents on the intranet, though accessible to all but editable by none.

Besides this, all the workers were adequately trained about the process flow of machines. They were also given proper instructions about the steps to operate the machine they were working on. For this purpose the instructions were noted down on a paper and placed near the machine to exercise a good operational control.

## Approach for determination and validation of results

Number of activities were undertaken to improve energy performance of the plant, which includes replacement of old inefficient motors by IE2 class high efficiency motors along with VFD's and LED light installation which gave a significant improvement in energy consumption. The projects were 1<sup>st</sup> documented and a detailed action plan consisting of responsibilities and time frame was formulated and accordingly steps were taken for implementation. For measuring the performance, a statistical tool called regression was used since it considered all the variables affecting the energy use and simultaneously assessed the effect of change on energy consumption.

Hence, a template for energy consumption determination and validation in excel format was prepared by our dynamic energy team. This template used the baseline

data and using regression as a tool and some mathematical calculations assessed the energy consumption for current period using the actual data for variables. This gives a self-generated report showing the variance between the actual and assessed energy consumption value and to give it a feather in the hat, color coding was given to values which deviated significantly from the preset limits. These deviated values were then given appropriate reasons by the respective departmental energy team member.

Since the system was fully integrated and scattered bits brought to place, the audits preparations were no trouble. Only minor things needed to be done like placing the instructions at proper places near the machines, checking the availability of documents on their specified location, etc.

## Cost benefit analysis

As said, the replacement of LED's lights and installing VFD's in place of conventional starters saved us 2.55 million rupees costing rupees 2.44 million. The other measures which contributed towards this savings include installation of solar light pipe, interlocking provided for ETP aerator motor and replacement of obsolete motors by high efficiency motors. It was the hard work of our team that led to completion of the saving projects on time, giving us an optimum payback period of 1 year.

## Lessons Learned

---

It was indeed a big task to implement the energy management system, but the willingness and dedication of the organization made it happen. Many lessons were learned in the due course. Team work, sharing of responsibilities, accountability, time management were the key things that played their role for EnMS implementation.

Raymond Chhindwara being a composite textile mill a lot of hurdles came our way, the biggest was the competency gap and training. The number of processes being large, the training and competence of workers working in each process was different and needed to be satisfied. After, a long brain storming with HR people it was decided to make a competency matrix department wise which would also cover the training needs in a single context.

Having a large number of machinery there connected load varying from 0.375 kW to 135 kW, the number of motors were also very large, approx. 3000. This made it difficult to identify and set the criteria for SEU equipment. Ultimately, after studying all the aspects and possibilities a value of 100 kW was considered to be taken as a base value for further analysis.

Through the Energy Management Working Group (EMWG), government officials worldwide share best practices and leverage their collective knowledge and experience to create high-impact national programs that accelerate the use of energy management systems in industry and commercial buildings. The EMWG was launched in 2010 by the Clean Energy Ministerial (CEM) and International Partnership for Energy Efficiency Cooperation (IPEEC).

For more information, please visit [www.cleanenergyministerial.org/energymanagement](http://www.cleanenergyministerial.org/energymanagement).

