Building a Competitive Edge Through Energy Management

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About the Author

Mr. S Raghupathy, Senior Adviser, Energy Management Cell - Confederation of Indian Industry has more than **15 years experience** of conducting **Detailed Energy Audit in over 500 companies**, covering variety of industries such as Mini steel, Sugar, paper, Textiles, Cement, chemicals, Foundry, Engineering, Petrochemicals, Fertilisers, Glass & Ceramics.

He was selected as **"National Expert - Energy Conservation" for the prestigious UNDP-EMC-CII (SR) Energy Bus Project.**

1.0 Introduction

Consequent to the energy crisis of the early seventies and the late eighties, energy conservation assumed tremendous importance in the Indian industry. Considering the industrial scenario at that point of time, survival was never an issue in a market, which was regulated and protected.

Then came the nineties and liberalization of the economy. Competitiveness and profitability became the core issues for survival. Any reduction in the operating costs meant a direct increase in profitability.

Energy costs turned out to be a major operating expense due to an ever-increasing trend in energy prices. Energy conservation techniques to reduce energy costs was seen as an immediate and handy tool to enhance competitiveness. The advent of innovative energy saving devices at affordable costs lent a cutting edge to adopt new techniques in energy conservation (EnCon).

There are a plethora of opportunities, if one could address the issue in a holistic perspective. The digital age that we live in today has shrunk the world, so much so, that companies are now looking at adopting World-Class energy efficient practices.

This has enabled a shift in focus from energy conservation to a more holistic approach - "World-Class Energy Management".

The Indian industry has since matured to a level where "Corporate Approach to EnCon" is perceived as one of the tools to achieve Global competitiveness. Companies are today strategizing on energy efficiency improvement, more than ever before.

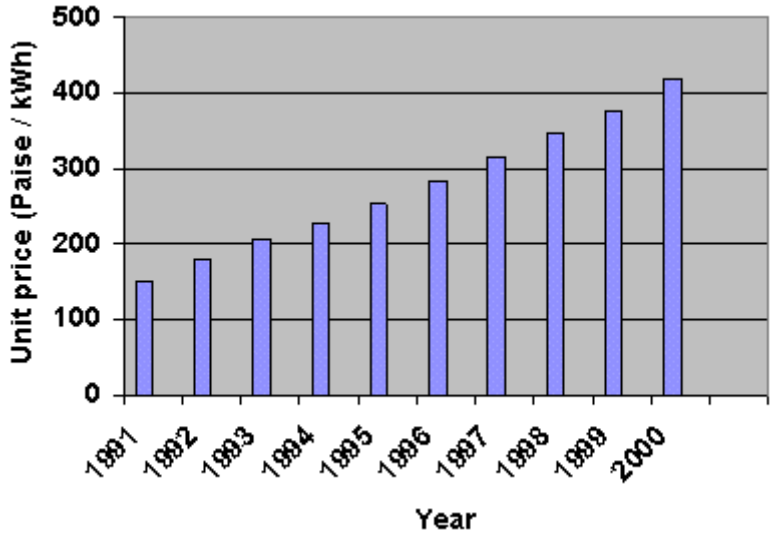
Capacity utilisation, Fine-tuning and Technology upgradation are the new mantra which have yielded astounding results in energy management, enabling companies to build a competitive edge.

2.0 Energy Costs

The energy cost as a percentage of the manufacturing cost has been increasing several fold in the last decade. For example, the cost of power in 2000 has escalated three-fold vis-à-vis the cost in 1991.

The profit margins in the energy intensive industries have not been able to bear the brunt of such steep increase in energy costs.

The increasing trend in energy costs is depicted in the graph below:



Graph-1: Increasing trend in energy costs

3.0 Energy Share in Manufacturing cost

Energy has a lion's share in the total manufacturing cost in majority of the sectors like Aluminium, cement, paper and ceramics. The following table shows the share of energy in the manufacturing cost for a few industrial sectors:

Table-1: Energy Share in Manufacturing cost

S. No	Sector	Energy cost as % of total manufacturing cost
1.	Aluminium	60-70
2.	Cement	35-40
3.	Paper	22-25
4.	Glass& Ceramics	20-25
5.	Foundry	15-20
6.	Textile	12-15
7.	Chemical	10-15
8.	Engineering	8-10

4.0 Energy Conservation Potential Vs Profitability

For the top management, the ultimate goal for taking up EnCon measures is to enhance profitability. This gives a competitive edge in a market where the consumer drives the cost of the product.

There are many success stories where corporates have addressed energy conservation issue in all earnest and achieved substantial increase in profitability.

Table-2 illustrates the saving potential available in a few sectors and their impact on increase in profitability.

Table-2: Energy Conservation Potential Vs Profitability

S. No	Sector	% Saving Potential	% Increase in Profitability
1.	Aluminium	15	9
2.	Cement	15	5
3.	Paper	20	5
4.	Glass& Ceramics	15	3
5.	Foundry	20	3
6.	Textile	20	3
7.	Chemical	15	2
8.	Engineering	20	1

5.0 Benefits of pursuing Energy Management

The following are some of the benefits that corporates could realize by pursuing energy management techniques:

- Enhanced cost competitiveness
- Improved profitability
- Conservation of natural resources
- Environmental benefits like Reduction of Green House Gas emissions

The other spin-off benefits of Energy management are:

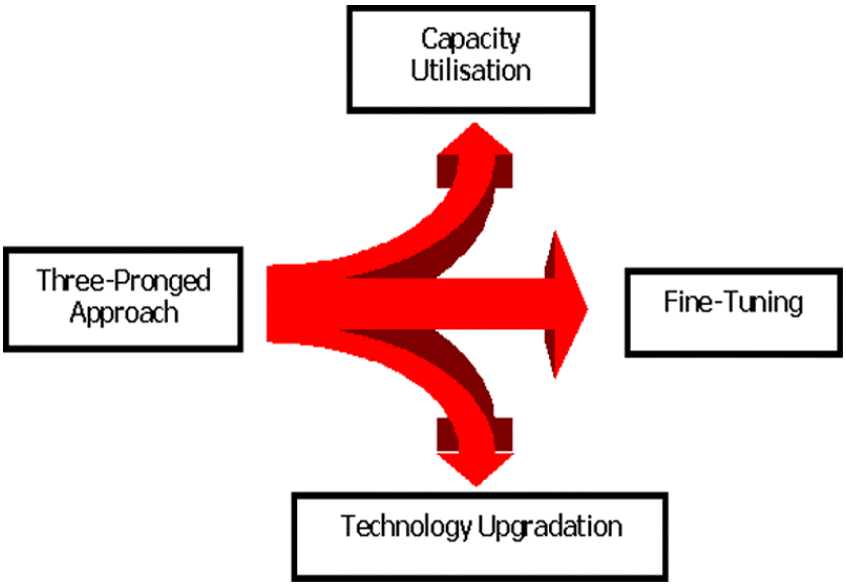
- Percolation of cost saving culture across the organization
- Improved productivity
- Improved performance of plant & equipment

6.0 Three-Pronged Energy Management Approach

Any effort towards energy conservation efforts get ultimately reflected on the specific energy consumption.

A study of about 400 companies revealed that excellent energy efficient companies have achieved lower specific energy consumptions by religiously adopting the three-pronged approach.

The Three-Pronged approach is developed based on the data collected through questionnaire from industries, diagnostic survey visits and through interaction with the plant personnel. The approaches are shown in the schematic below:



a. Capacity Utilisation

High capacity utilisation is very essential for achieving energy efficiency. This brings down the fixed energy loss component of the specific energy consumption.

Survey of excellent energy efficient companies show that 80% of the companies attribute capacity utilisation as one of the foremost reason for a major drop in specific energy consumption.

Atleast 90% capacity utilisation is to be ensured for achieving low specific energy consumption. Also achieving high capacity utilisation is under the control of plant personnel.

Hence the first and foremost step for an aspiring energy efficient unit should be on increasing capacity utilisation and reduce the specific energy consumption.

b. Fine Tuning of Equipment

This is another opportunity for saving energy. On achieving high capacity utilisation, the fine tuning of equipment should be taken up by the energy efficient plants.

Various energy audit studies reveal that 'Fine-tuning', if efficiently done can yield 3 to 10% of energy saving. The greatest incentive for resorting to fine tuning is that it requires only marginal investment.

c. Technology Upgradation

Higher capacity utilisation and fine-tuning of equipment have significant energy saving potential. But quantum jumps in energy saving can be achieved only by application of new technologies/upgradation of existing technology. Innovation, improving of existing technology and application of newer technology should be made an on-going activity in all the sectors of industry.

If a company is targetting for 20% savings and above, the three-pronged approach is to be adopted. Infact one of the characteristic of excellent energy efficient companies is to have three teams working separately on Capacity utilization, Fine-tuning of equipment and Technology upgradation with ultimate focus on energy conservation.

7.0 Corporate Approach

An analysis of majority of excellent companies reveal that a corporate approach with corporate commitment is a vital catalyst to initiate and sustain energy conservation movement in the company.

The following steps should be carried out as part of the corporate approach:

a. Cross-Functional Working Group

An "Energy Task Force" is formed comprising of representatives from Production, Maintenance, Materials, Finance departments, etc., with Managing Director or Head of the unit as Chairman.

This kind of approach provides ownership for each of the members as against assigning a particular individual or department responsible for energy conservation.

This group should identify the projects and group them as short, medium and long term. The short medium proposals, which are quick hits, can result in immediate benefits. Other proposals / schemes should have a specific implementation plan and should be monitored proposal by proposal.

b. Interaction with Equipment Manufacturers / Consultants

In order to update latest happenings, the task force should arrange for periodic interaction with equipment manufactures and consultants. These interactions will also help in building relationships, which is very important in the long run.

c. Internal and External Audits

The task force should conduct periodic audits and assess the performance on the energy front.

Energy audit by external experts can open up new ways of looking at the plant and will lead to cross-fertilization of ideas across different sectors.

d. Bench Marking

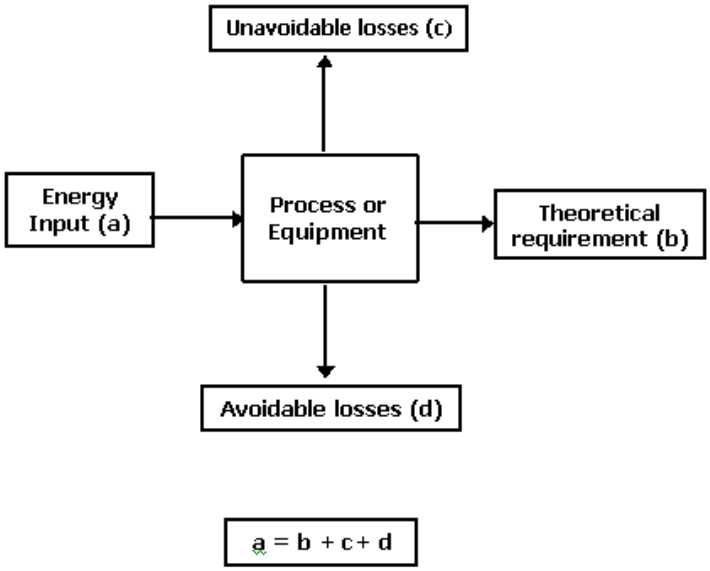
The task force would continuously set world-class targets and achieve them. These benchmark define clear milestones to be achieved.

The company should try to beat their own targets and this approach is seen to be a powerful motivator to achieve success in energy management.

8.0 Energy Audit Methodology

Energy audit methodology is a systematic approach to reduce energy consumption. It covers all forms of energy and energy costs of the system, such as electrical energy, thermal energy etc. **The ultimate aim of the Energy Audit is to reduce the energy cost per unit of production.**

A systematic approach to Energy Audit is to identify all Energy users and ask simple questions related to energy like **"What? When? Why? Where?"** Answers to these questions have resulted in identification of innovative Energy projects in many successful companies.



The next step is to identify the losses and segregate them as **"Avoidable" and "Unavoidable "** losses.

For a motor with a rated efficiency of 90%, the 10% loss that comes by design is termed as the **"Unavoidable loss".** From the view point of operating personnel, it is not possible to minimize on the 10% loss, unless there are design improvements at the manufacturing stage.

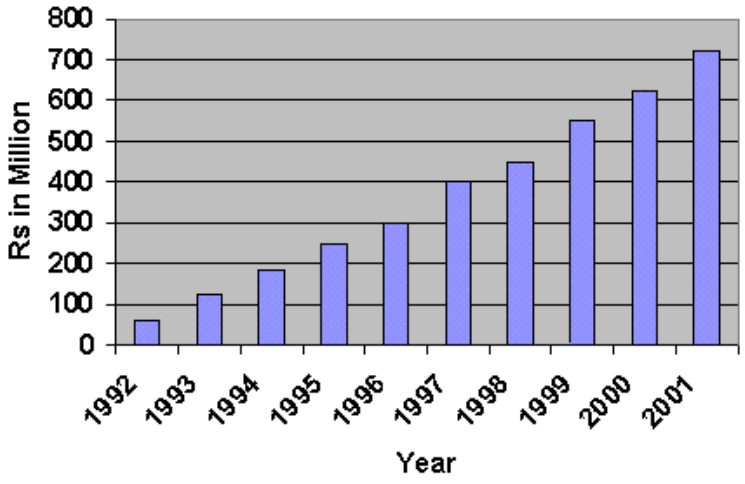
On the other hand, if the same motor is operating at 80% efficiency, the loss between 90% and 80% ie. 10% is termed as **the "Avoidable loss". It is possible for the operating personnel to identify the reasons for inefficiency and take corrective action.**

The entire focus of the audit will be to reduce the Avoidable losses.

The next logical step is to quantify the losses. **Quantification helps to appreciate the magnitude of the losses and is a powerful starter for the drive towards implementation.**

Identification of ways and means for the reduction of losses give rise to the creation of Encon projects.

9.0 Achievements of CII-Energy Management Cell



Graph 2: Trend in savings achieved by CII - EMC audited companies

Adopting the three-Pronged strategy, CII-Energy Management Cell has so far carried out **320 detailed energy audits** catalyzing an annual savings of **Rs 720 millions** in the audited units.

In appreciation of its outstanding contribution towards energy management, CII - EMC has been awarded, the **"National Best Energy Auditor"** Award for the fourth consecutive year (2001-02). Recently, the Cell has spread its wings to offer energy management services outside India. One of the recently audited units is **AGRC at Armenia** and CII - EMC has signed an **MoU with Lanka Transformers Ltd, Sri Lanka** to offer energy audit services and training.

CII-EMC, which operates from Chennai, Chandigarh and Ahmedabad, is equipped with 20 professionals and state-of-the-art instruments.

For further details on Energy Management and services of CII-EMC, please visit www.greenbusinesscentre.com or contact through gbc@ciionline.org

10.0 Conclusions

Energy management can be a clear winner in building a competitive edge for the Indian Industry.

The Three-Pronged strategy combining Capacity utilisation, Fine-tuning of equipment and Technology upgradation have resulted in phenomenal savings as illustrated by some of the excellent energy efficient companies.

The Three-pronged approach in combination with the corporate approach and commitment can provide the right impetus to reap the benefits of energy conservation on a sustained basis.

Besides improving the cost competitiveness and environmental performance, excellent energy management practices would offer other spin-off benefits like percolation of cost saving culture across the organization, improved productivity and improved performance of plant & equipment.

For further details Contact:

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Reference:

http://www.greenbusinesscentre.com/energymanag.asp