



ORIGINAL RESEARCH PAPER

Engineering

Energy Management Programme in a given Industry.

KEY WORDS: Energy Conservation, Energy Management, Energy Audit

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ABSTRACT

The consumption of energy is increasing day by day. One way to cope up with the increase in energy demand is to increase the production of energy which demands more investment and the other way is to conserve the energy because energy conserved/saved is energy generated. Energy conservation means reduction in energy consumption but not compromising with the quality or quantity of energy production.

INTRODUCTION:

India's energy consumption is growing faster than that of world's energy. However the domestic energy supplies are not growing at the same pace owing to host of factors including fuel unavailability, delays in clearances, project delays and inadequate innovative technologies. This has resulted in increased reliance on energy imports and rise in fuel prices. In current times, Indian industries are facing challenges due to economic slowdown. The problem has worsened due to rising inflation, unreliable grid power and increasing energy costs. In the midst of these trying times, wherein energy cost constitutes 10-20% of the total cost, energy management could be the key for optimizing cost and enhancing competitiveness. It has been seen that management of energy is often neglected, even though there is considerable potential to save energy and reduce costs. Energy management requires an organization to develop a holistic understanding of energy consumption and optimize its utilization without compromising productivity. For effective implementation of energy management solutions, industries need to adopt a strategic approach towards energy procurement & consumption and define energy management goals for their organization. Owing to changes in policy, advancement in technology and process redesign, there are numerous solutions available for energy management. The Government has also provided the necessary support and regulations for adopting energy efficiency initiatives. Suppliers are to propose the broadest possible selection of COMPREHENSIVE ENERGY CONSULTING AND MANAGEMENT SERVICES they offer. The intent of this solicitation is to provide Participating Public Agencies with services and solutions to meet their various needs.

What are industrial energy management programmes?

Energy management programmes (EnMPs) are policies and initiatives that encourage companies to adopt energy management. Energy management involves the systematic tracking, analysis and planning of energy use. Energy management systems (EnMSs) include energy management activities, practices and processes. In his paper, EnMSs mean not only standards such as ISO 50001 or EN16001 but also other frameworks for systematic energy management defined according to particular specifications. A number of other terms are useful in understanding this publication. This publication focuses principally on government programmes that promote and support the adoption of EnMSs. The report, however, also covers government programmes that promote only certain aspects of energy management practices, i.e. components of energy management.

Governments and organizations promoting the rational use of energy have recognized the important role of EnMSs and are developing and implementing programmes to promote the use of EnMSs in industry. A number of government programmes have been established around the world to encourage, facilitate or mandate industrial companies to undertake energy assessments, and to establish management systems or energy management components. Experience has already shown that the market

uptake of EnMSs is correlated with government-led programmes that stimulate and encourage enterprises to apply the EnMS (Goldberg et al., 2011). Many governments are now turning their attention to incorporating ISO 50001 into their programme.

Why energy management programmes are important?

Energy management programmes (EnMPs) are important, because they encourage energy reduction, greenhouse-gas reduction and productivity benefits in firms. For governments, they act as a framework to encourage industry to achieve these outcomes by effectively adopting energy management systems (EnMSs) and supporting activities outlined in the EnMP. The main benefit of EnMPs is that they help companies overcome barriers to the implementation of EnMSs, and provide guidance and support for the implementation process.

Because energy-saving measures and actions in the industrial sector are one of the most cost-effective options to reduce energy use and greenhouse-gas emissions, EnMPs are an efficient way for society to achieve wider policy goals in the area of energy efficiency, energy security and climate change mitigation. EnMPs can be linked to and support policy objectives in key areas: Sustainable economic development, in terms of the improving the competitiveness and productivity of industry, cutting costs, reducing exposure to volatility of energy prices, managing risks, and fostering innovation and technology development/adoption.

Energy security and demand-side management objectives.

1. Energy efficiency and/or greenhouse gas reduction targets, through energy-saving agreements and emissions trading schemes.
2. Environmental objectives, such as greenhouse- gas emission reductions and reducing local pollutants.

Experience in European countries has shown that EnMPs can usefully contribute to enhance energy-savings performance beyond isolated energy management activities, facilitate company achievement of target-setting policies and other policy objectives, and ease the burden of compliance checks on the government (Goldberg et al., 2011). This section first discusses the role of EnMPs in helping companies overcome barriers to taking energy efficiency actions. The section then describes the benefits that EnMSs can provide.

How to deliver energy management programmes?

There are four phases of effective energy management programme delivery: Plan, implement, monitor and evaluate phases. These phases are then broken down into ten critical programme steps, and sets of actions. The steps and actions are supported by experience drawn from practitioners and are further demonstrated in two case study examples. The Planning phase helps countries to ask the right questions and to carefully plan, in consultation with key stakeholders, the programme design and implementation. The Implementation phase outlines the main steps necessary for ensuring a successful outcome. The Monitoring phase helps identify indicators and methods for

measuring organizational change, energy savings and other results. The Evaluation phase focuses on how to capture lessons learned, assess effectiveness and make improvements. During the four phases, different types and levels of stakeholder consultation and engagement are important to help define the needed interventions, design compliance and verification requirements, comment on proposals and share experience on specific barriers. Appointment of the energy manager who will report to the works manager. Identify an energy management team consisting of production manager, maintenance manager utility manager, and chief electrical engineer. Monitoring the energy use regularly and introduction of energy audit. Awareness training programme of short duration at the highest level of executives.

• ENERGY MANAGEMENT STRATEGIES

Energy management strategies for different time horizons such as short, medium and long run are likely to be different. Following are the main actions of energy manager in industry.

- Monitor energy use patterns of various departments and develop energy management action plans.
- Develop intensive links with other departments and involve other managers in this activity.

SHORT TERM ENERGY MANAGEMENT STRATEGIES

- Appoint energy manager
- Assess lighting practices
- Monitor energy consumption
- Plan maintenance
- Reduce wastes and leaks
- Conduct energy audit

MEDIUM TERM ENERGY MANAGEMENT STRATEGIES

- Prepare and plan for detailed conservation plans
- Improve production process controls
- Change and reduce lighting levels
- Use waste heat recovery system
- Install total energy systems
- Energy reporting systems

Low efficiency boilers can be changed to high efficiency boilers with forced draught. Study about energy conservation alternatives. Changing over to new production or process technologies. Investing the use of process waste heat, cold forming of various products, gravity conveying of materials and recycling of waste materials. Identify and initiate R & D projects for energy conservation or improving energy efficiency. Reassessing the production lay-out or control procedures. Establishing an integrated energy management information system.

IMPLEMENTATION OF ENERGY MANAGEMENT

- Influence the top management to get commitment for energy management.
- Appreciation programme for senior level executives.
- Identify the broad energy management objectives.
- Select energy manager with commitment, interest and expertise.
- Creation of an energy management committee.
- Review the past and present patterns of fuel and energy use.
- Preliminary energy use survey.
- Development of an energy audit format.
- Detailed energy audit covering process facilities and equipments.
- Calculation of annual energy use based on audit results.
- Interfirm and intrafirm energy use comparisons.
- Analysis and simulation to evaluate energy management options.
- Economic analysis of selected energy management options
- Establish energy management objectives for the organizations and the individual units.
- Implement energy conservation opportunities which involve house keeping and maintenance type actions with little or no cost.
- Establish measurement and reporting procedures including monitoring and recording instruments.

- Equipment modifications and replacement which can be implemented using available hardware and technology without large capital expenditure.
- Determine capital investment requirements for long term energy management.
- Constitute routine energy management reporting procedures and publicise results.
- Identify energy conservation opportunities involving higher capital outlays as well as R & D.
- Promote continuous awareness among managers.
- Stimulate worker involvement in energy management activities.
- Periodic review and evaluation of energy management system.

Many Indian companies have institutionalised energy management procedures and achieved excellent results. These companies are TATA Iron and Steel, Indian Aluminium, Alkali and Chemicals Corporation of India (ACCI), Madras Refineries.

INTERNATIONAL SCENE:

Management of energy at the international level has made gigantic strides in Belgium, France, Canada, Germany, Japan, U.S. In India Target industries are Aluminium, Cement, Electricity Generation, Glass, Paper, Foundries, Basic chemicals, Refractories, Chemical Fertilizers, Plastic, Silk and rayon, mining, manmade fibres, Cotton textiles, dyes, Industrial gases, jute textiles, Metal products, Rubber, Woollen textiles, sugar, edible oils, pharmaceuticals, electrical machineries.

CONCLUSION:

In this way energy management is one of the major areas needing urgent governmental actions. Policy measures should be identified which will support the energy efficiency improvements in industries. Strong administrative and political commitments will make energy management a strong movement across the industries.

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