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ABSTRACT

The issue under discussion is a burning point as far as the whole process of energy management is concerned. In the existing energy management system the weakness is mainly due to lack of effectiveness of implementation of energy audit recommendations due to various reasons beyond the control of Energy Auditor. So it is to be addressed effectively to make it more practical and free from the clutches of bureaucracy as well as vested interests of all those who has to play a role in its implementation.

Energy is a precious national commodity and is to be used judiciously. Energy conservation is the job of each and every responsible citizen. To achieve this goal What we need is to strengthen the hands of Auditors to get implemented the recommendations by making both Auditors and Consumers responsible for the lapses.

In the present system the pace of implementation is totally based on the support of top management of a company for which neither Energy Auditor nor the Indian administration has control. As this is an issue to be tackled directly for the mutual benefits of Auditor and Industry and indirectly to support the national economy as a whole, a system is to be evolved to make it conducive for both Auditor and Industry to implement the recommendations and making both responsible for lapses incorporating suitable penalty clauses for wastage of precious energy.

Wastage of energy is to be strictly dealt like wastage or misuse of money by way of extending the support of vigilance, making the technical hands to condemn the energy inefficient machineries and to replace the obsolete technologies by energy efficient advanced technologies.

This paper discusses in detail on the issue and proposed remedial measures to overcome the negatives of existing system through SWOT Analysis.

INTRODUCTION

Energy the drive force of the universe available to the mankind for day to day use is depleting day by day. Our dependency on fossil fuels is polluting the environment leading to climate change. Environmental impact of fossil fuels is going to affect the very existence of our planet and it is time for each and every nation to act responsibly

to avoid the impact of fossil fuels by way of using it efficiently with zero wastage. Developed countries like USA, JAPAN, UK etc are using the energy more efficiently and their energy intensity is far better than our country.

On the "Logo" of Bureau of Energy Efficiency, the slogan "Energy is life" sends a clear message to everyone that energy is the root cause of everything in this universe and without it there is no question of existence of anything whatever we enjoy today.

One can live without money for hours and days together but not without energy. So from this one can understand the importance of its role in our day to day life and need of its judicious use.

But, is this fact is taken care of by the existing energy management system?

Answer is plain "No".

So it is very important to have a check on the use of energy and to have remedial measures for which ENERGY AUDITING can play a pivotal role.

Basically the job of any type of auditing is a painful affair to the Auditee and a responsible job for the Auditor in the present environment as it is considered as a function to pin point the fault of Auditee.

So in the present environment the function of auditing generates basically two forces

- 1) The force of Auditee to reduce the no. of observations of energy wastage areas to safeguard himself .
- and
- 2) The force of Auditor to pinpoint maximum no. of wastage areas to show maximum energy saving opportunities and to reduce the specific energy consumption of an industry to show his importance and worth.

Here the forces are opposite in nature so naturally the net force is going to be less either negative or positive contributing negligible benefits towards the very purpose of auditing.

If we can evolve an energy management system to make both the Auditee and Auditor to generate positive forces, then no doubt the net force will be conducive to generate an incredible impact on the outcome of auditing.

So our subject of discussion should be "How to generate this positive force?"

So no doubt this could be generated only by conducting the audit with TEAM SPIRIT from both Consumer and Auditor point of view supported by legislative, executive, administrative and judicial machinery to make it mandatory to implement the recommendations within a specified timeframe to make energy efficiency a way of life in our country.

This is discussed in detail in this paper through SWOT analysis of existing system and remedial measures have been suggested to overcome the deficiencies and to make it more practical and consumer friendly.

SWOT ANALYSIS OF EXISTING ENERGY MANAGEMENT SYSTEM

SWOT analysis stands for analysis of Strengths, Weaknesses, Opportunities and Threats.

First of all let us analyze the strengths of existing system.

1. Govt. recognized the importance and role of energy conservation in the economic development of a country by introducing Energy conservation act-2001.
2. Govt. enacted Energy Conservation Act-2001 to make it mandatory for all designated consumers to undergo the process of energy auditing by an accredited energy auditor.
3. A separate Governing, monitoring and control body named "Bureau of Energy Efficiency" to play pivotal role to fix up energy efficiency norms and monitor its compliance by industries.

4. Creation of Energy Manager Post in all designated industries and posting a qualified/certified Energy Manager by BEE.
5. Tangible efforts by BEE to disseminate the message of energy efficiency to the people through web site www.energymanagertraining.com and information sharing by uploading industry experience on the site.
6. Soft loans by Banks for energy efficiency projects industries.
7. Highly qualified and dedicated manpower resource availability throughout the length and breadth of the country.

WEAKNESSES

1. Lack of administrative machinery support for enforcement of energy efficiency norms in industries.
2. No system to check the energy efficiency of a proposal/project at planning/proposal stage as a preventive measure. Energy auditing in the present scenario is only a post mortem job.
3. No policy for replacement of equipment based on energy efficiency in industries.
4. No administrative or judicial support to stop manufacturing of energy inefficient products. Everyone knows 36 watts tube can do the job of 40watts at the same procurement price. Still the product is under stopped.
5. No incentive scheme available for individuals for use of energy efficient products or renewable energy sources at home.
6. No legislation to make use of renewable energy sources like wind, solar etc mandatory , wherever possible , to reduce dependency on fossil fuels.

7. This leads to hiding of lot of facts responsible for energy wastage to continue the inefficient machineries and practices defeating the very purpose of audit.

OPPORTUNITIES

1. New electricity supply act – 2003 permits to produce and supply electricity by any private agencies. This could be made use of by companies to generate power and supply for own use and also sell to other consumers. This can reduce the transmission losses if the same power is being taken from the grid.
2. Wind energy potential of India is 45000MW and till date we have tapped only 1750mw (Approx). Cost of generation of wind power is less than the conventional energy sources. In the area of Wind energy India's position is the 5th in the world and can take further lead as India is the only country in the world to have a separate Ministry for Non conventional energy sources. Moreover wheeling of power through state grids is permissible by entering into power purchase agreements with state electricity boards and charging for energy based on net metering.
3. CDM (Clean Development Mechanism) permits Countries/companies to make use of carbon credits by using energy efficient and renewable technologies.

BP Amoco Global petroleum giant made use of carbon credits to convert 10% of their power requirement through renewable sources of energy without any investment from their internal resources. BP Amoco achieved their emission reduction target as per Kyoto protocol in 2002 itself instead of by 2010 by making use of carbon credit .So one can understand the potential of depending on renewable sources and energy efficiency technologies.

So what we need is a strong policy and mechanism to implement it.

4. Make use of energy efficient technologies by replacing obsolete ones.

5. Emphasis on Efficient use of energy only can lead to professionalism in industries.
6. Implementation of Renewable energy projects attracts 100% depreciation in the year of implementation itself giving relief the burden of income tax.

THREATS

1. Energy intensity of our country is 3.7, 1.5 and 1.4 times than that of JAPAN, USA and ASIA respectively indicating high level of energy wastage.
2. No legislative, administrative or judiciary support to penalize energy wastages by industries. Wastage of energy is like wastage of money so to be dealt firmly.
3. Freedom to implement or not to implement Energy efficient technologies totally depends on the wish and will of a company management now.

Electricity is a national commodity and its wastage should be dealt with appropriate penalty clauses. **What we need is 3Fs approach to consumers i.e. Fair, Friendly and Firm towards implementation of energy audit recommendations.**

4. Energy Auditors are not given adequate power to deal with non implementation of audit recommendations.
5. Implementation of audit recommendations are not made mandatory.
6. In general Govt. acts and rules are made only to satisfy papers but not in the real spirit of achieving the set goals.
7. No provision to penalize Auditors in case of financial loss after implementation of their recommendations.

8. No preventive techniques existing to arrest energy losses at the planning and execution stage of a project. Existing energy auditing is only a post mortem method.
9. No role for energy auditors at the planning stage of projects to select energy efficient technologies for processes.
- 10.No standard for energy index for similar type of industries and no encouragement for best energy index achievers.

SUGGESTIONS FOR EFFECTIVE IMPLEMENTATION OF ENERGY AUDIT OBSERVATIONS AND TO ENHANCE ENERGY EFFICIENCY AND BY INDUSTRIES

Engineering is the economical application of science for the benefit of mankind.

Definition of an Engineer is "One who does things with one Rupee what others do with two Rupees". So Engineers started thinking in terms of overall cost only and forgot about the hidden energy cost factor attributed to energy efficiency.

It is a fact that the cost of energy to operate an equipment is almost 98% of the lifecycle cost of a equipment and it reveals how energy efficiency can play decisive role in the process of cost reduction

As far as a finance man is concerned, his objective would be to achieve something with least possible cost. But as far as an Engineer is concerned his objective should be to do something with the least possible ENERGY AND COST.

We have very stringent rules and procedures to use public money and strict vigilance over misuse of it and severe punishment for negligence and misuse. But we do not have any system existing to have a check on the energy need/efficiency of a particular proposal even though it has got potential to eat away the money of a company in the form of energy charges.

In all organizations whether private or public there is a procedure of financial concurrence of proposals before sanction , but there is no system existing today to

check whether the proposal is energy efficient among the available choices for a particular need. So what we need is not only auditing a plant or factory (This is like post mortem) during its operation but also at the initial proposal stage itself to check for energy efficiency of a proposal among the available choices in the market. So Energy Managers in a company can play this role by vetting each and every proposal based on the data given by the user department in a standard Performa comparing the energy efficiency of various alternative products or systems.

So the job of a Energy Manager could be PREVENTIVE and that of an auditor could be CORRECTIVE

If this is made mandatory, all industries will be particular about energy efficiency of their products. .

Basically the job of any type of auditing is a painful affair to the Auditee and a responsible job for the auditor in the present environment as it is considered as a function to pin point the fault of auditee.

So in the present environment the function of auditing generates basically two forces

1. The force of AUDITEE to reduce the no. of observations of energy wastage areas to safeguard himself

and

2. The force of AUDITOR to pinpoint maximum no. of wastage areas to show maximum energy saving opportunities and to reduce the specific energy consumption of an industry to show his importance and worth.

Here the forces are opposite in nature so naturally the net force is going to be less either negative or positive contributing very less towards the very purpose of auditing.

If we can make both the Auditee and Auditor to generate positive forces then no doubt the net force will be conducive to generate an incredible impact on the outcome of auditing.

So our subject of discussion should be "How to generate this positive force?" and what are the legislative, executive, administrative and judicial support required to make energy efficiency a way of life in our country.

This is the very reason why energy auditing is not able to generate desired benefits to the companies and nation as a whole.

At present energy audits are ending up in three categories depending on the domination of negative/positive force and are mentioned below

1. If positive force is more the project is going to become successful.
2. If negative force is more the project is going to be a failure
3. If forces are equal it will fall under barrier category.

To overcome the barriers in energy auditing the following suggestions are made based on the above discussions.

1. Implementation of energy audit observations to be made mandatory by signing a contract between Auditor and Consumer for time bounded implementation. For delay or lapse in implementation top management is to be directly made responsible for the losses with suitable penalty and even stoppage industry
2. The response of industries for implementation of recommendations are poor mainly because the existing audit is only a post mortem approach and forcing an industry for fresh investment for new equipment/system.

Hence it is required to emphasis for energy pre-audit also by Energy Managers of an industry as a mandatory provision by giving extra power to Energy Managers.

Procurement of equipments in industries to follow life cycle cost concept instead of initial cost as energy cost of an equipment in its life cycle is in the range of 98 to 98.5%. So an inefficient equipment is a curse for the profitability of an industry.

3. Clearance by Energy Managers in an industry for energy intensive proposals before financial sanction is to be made mandatory to check the proposal for

energy efficiency. Existing auditing system is again a post mortem approach leading to colossal wastage of energy. **Prevention is better than cure**, so we need to concentrate equally on preventive auditing also.

4. Energy auditors to be empowered with issue of show cause notices and recommendation for penalty to be imposed by Bureau of Energy Efficiency on a defaulted industry.
5. Energy auditor and Energy Manager of an Industry to be made responsible in case desired results are not achieved by an industry after implementation of recommendations.
6. Payment to Auditors must be made in two parts as mentioned below.
 - One part to take care of the actual or running expenditure or cost towards energy audit as energy audit is mandatory for a company to undergo every year.
 - Second part or fixed cost to be paid on the basis of savings actually accrued by implementing their recommendations.
7. Statutory budget provisions in annual budgets of Industries to implement Energy audit observations.
8. All proposals of energy audit observations are to be made FCNR by an industry as the duty of cost benefit analysis is already taken care of by Energy Auditor in all recommendations.
9. No room should be left for the industry Management whether to implement or not once the observations are mutually agreed for the benefit of energy conservation.
10. Energy Managers in an Industry are to be given additional powers by BEE to issue show cause for lapses implementation on behalf of BEE to the user departments.

11. All recommendations are to be implemented in a specified timeframe and the Head of an industry is to be made directly responsible for implementation as this is a case of national loss and in case of lapses he should be made directly responsible for the wastages incurred during the extra time taken for implementation.
12. There should have a list of inefficient technologies not to be used in industries and to be circulated to all industries.
13. Manufacturing of inefficient products are to be stopped by industries giving enough time for them to replace by alternative products. For example it is high time for stoppage of manufacturing of 40 watts tube lights when 36 watts tube lights with same cost and better efficacy is available.
14. In short only through management techniques we can not achieve the energy efficiency targets we need to have energy administrative powers and tools for tackling energy inefficiency.
15. Like financial balance sheet it is required to have a provision of energy balance sheet and get it audited by energy auditors before the annual accounts are passed by a firm. Energy loss is to be considered as a national loss and industries are to be made responsible for it by incorporating suitable penalty clauses for the lapses of non implementation of Energy Audit recommendations . Industries should not be given free hand to run inefficient machineries wasting the precious national commodity energy.
16. Financial loss may be a loss confined to a company but energy loss is a loss to the Nation as a whole. So it is very important to have proper accounting of energy use and a reporting system to have a check on it.
So the role of Energy Auditors are very important and to be respected without leaving any room for its authenticity from professional and adm. Point of view.

CONCLUSION

Energy auditing is to be done with team spirit from both Auditor and Consumer for synergic effect to tap the potential of energy efficiency of a process for better

productivity and profitability. Energy Auditor should take the role of a facilitator rather than the role of a Vigilance Officer.

However if Consumers are not responding favorably there should have provisions for hard administrative tools to deal with. An ideal approach would be that of fair, friendly and firm.