5. ENERGY ACTION PLANNING

Syllabus

Energy Action Planning: Key elements, Force field analysis, Energy policy purpose, perspective, Contents, Formulation, Ratification, Organizing - location of energy management, Top management support, Managerial function, Roles and responsibilities of energy manager, Accountability. Motivating-motivation of employees: Information system-designing barriers, Strategies; Marketing and communicating-training and planning.

5.1 Introduction

Energy efficiency is extremely important to all organisations, especially those that are energy intensive. The four vital requirements for a successful energy management is shown in Figure 5.1. Any successful energy management programme within an organisation needs the total support of top management. Hence, top management support is the key requirement for success. Top management should give energy efficiency equal importance in their corporate objectives as manpower, raw materials, production and sales. The other important requirements are a well charted strategy plan, an effective monitoring system and adequate technical ability for analysing and implementing energy saving options.

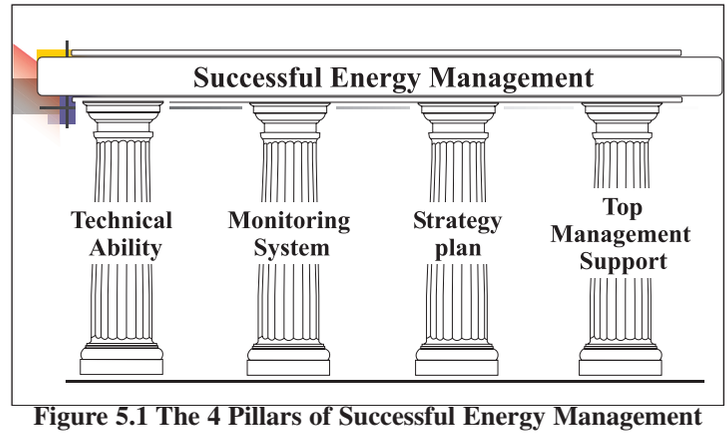


Figure 5.1 The 4 Pillars of Successful Energy Management

5.2 Energy Management System

Organizations seeking financial returns from superior energy management continuously strive to improve their energy performance. Their success is based on regularly assessing energy performance, planning and implementing action plans to improve energy efficiency. Hence a sound energy management system is a prerequisite for identifying and implementing energy conservation measures, sustaining the momentum and for effecting improvements on a continuous basis. The various steps for energy action planning are shown in Figure 5.2.

Figure 5.2 Steps in Energy Action Planning

5.2.1 Top Management Commitment and Support

Top management shall make a commitment to allocate manpower and funds to achieve continuous improvement. To establish the energy management programme, leading organizations appoint energy manager, form a dedicated energy team and institute an energy policy.

Appoint an Energy Manager

The tasks of energy manger are setting goals, tracking progress, and promoting the energy management program. An Energy Manager helps an organization achieve its goals by establishing energy performance as a core value.

The Energy Manager is not always an expert in energy and technical systems. Successful Energy Manager understands how energy management helps the organization achieve its financial and environmental goals and objectives. Depending on the size of the organization, the Energy Manager role can be a full-time position or an addition to other responsibilities.

Location of Energy Manager

The energy management function, whether vested in one "energy manager or coordinator" or distributed among a number of middle managers, usually resides somewhere in the organization between senior management and those who control the end-use of energy. Exactly how and where that function is placed is a decision that needs to be made in view of the existing organisational structure.

Energy Manager: Responsibilities and Duties to be Assigned Under The Energy Conservation Act, 2001.

Responsibilities

- Prepare an annual activity plan and present to management concerning financially attractive investments to reduce energy costs
- Establish an energy conservation cell within the firm with management's consent about the mandate and task of the cell.
- Initiate activities to improve monitoring and process control to reduce energy costs.
- Analyze equipment performance with respect to energy efficiency
- Ensure proper functioning and calibration of instrumentation required to assess level of energy consumption directly or indirectly.
- Prepare information material and conduct internal workshops about the topic for other staff.
- Improve disaggregating of energy consumption data down to shop level or profit center of a firm.
- Establish a methodology how to accurately calculate the specific energy consumption of various products/services or activity of the firm.
- Develop and manage training programme for energy efficiency at operating levels.
- Co-ordinate nomination of management personnel to external programs.
- Create knowledge bank on sectoral, national and inter-national development on energy efficiency technology and management system and information denomination
- Develop integrated system of energy efficiency and environmental up gradation.
- Co-ordinate implementation of energy audit/efficiency improvement projects through external agencies.
- Establish and/or participate in information exchange with other energy managers of the same sector through association

Duties

- Report to BEE and State level Designated Agency once a year the information with regard to the energy consumed and action taken on the recommendation of the accredited energy auditor, as per BEE Format.
- Establish an improved data recording, collection and analysis system to keep track of energy consumption.
- Provide support to Accredited Energy Audit Firm retained by the company for the conduct of energy audit
- Provide information to BEE as demanded in the Act, and with respect to the tasks given by a mandate, and the job description.
- Prepare a scheme for efficient use of energy and its conservation and implement such scheme keeping in view of the economic stability of the investment in such form and manner as may be provided in the regulations of the Energy Conservation Act.

Form A Dedicated Energy Team

The tasks of energy team are executing energy management activities across different parts of the organization and ensuring integration of best practices.

Decisions affecting energy use are made every day by employees at all levels in an organization. Creating an energy team helps to integrate energy management activities in an organization.

In addition to planning and implementing specific improvements, the energy team measures and tracks energy performance and communicates with management, employees and other stakeholders.

The size of the energy team will vary depending on the size of the organization. In addition to the Energy Manager who leads the team and dedicated energy staff, the team can include a representative from each operational area that significantly affects energy use, such as:

- Engineering
- Purchasing
- Operations and Maintenance
- Building/Facilities Management
- Environmental Health and Safety
- Contractors and Suppliers
- Utilities

Energy team can encourage communications and the sharing of ideas between various departments in an organization. It can serve to obtain agreements on energy conservation projects, which affect more than one department. It can provide a stronger voice to the top management than a single energy manager normally could. The composition of the energy team will vary from one organization to another, depending on the existing management structure, the type and quantity of energy used and other company-specific factors. A typical example of orga-

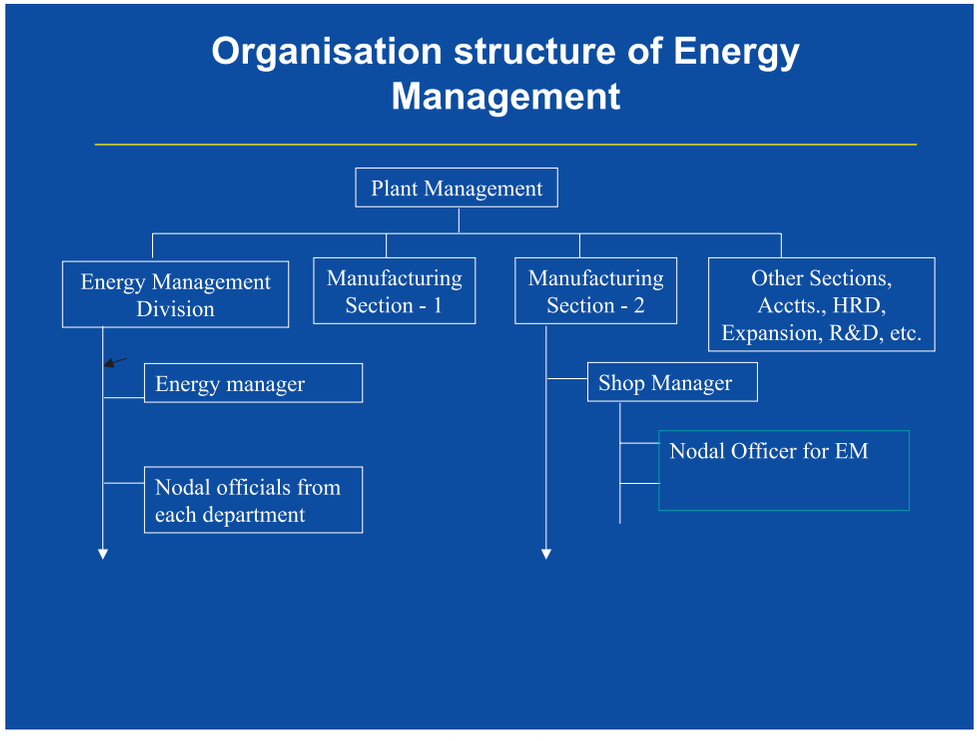


Figure 5.3

nizational structure of an energy management and location of an energy manager are shown in Figure 5.3. The location of energy management function in a typical corporate sector and larger organization is shown in Figure 5.4.

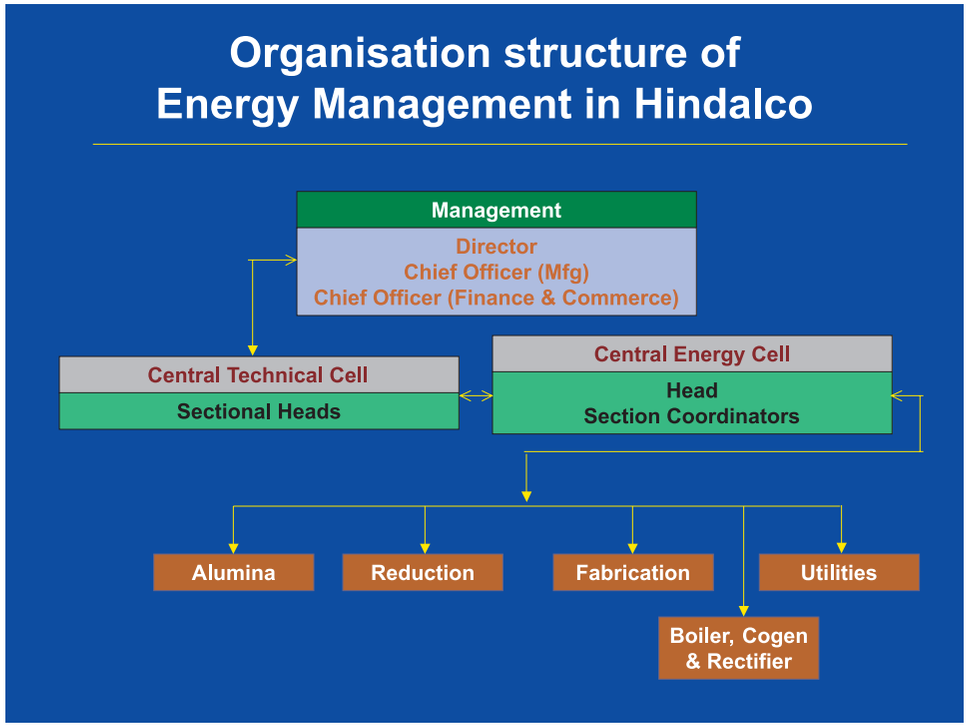


Figure 5.4

The frequency of team meetings depend on the importance of energy costs in the overall cost structure of the company and what projects are in progress at any time. Normally a monthly meeting is usual, so that monthly production and energy consumptions may be reviewed together by the committee. This review would include a comparison of actual performance against previously set targets and budget figures, as well as against previous months. Other items for the agenda should be a review of the status of energy conservation investments in progress or planned.

Institute an Energy Policy

Energy policy provides the foundation for setting performance goals and integrating energy management into an organization's culture and operations.

Energy Policy provides the foundation for successful energy management. It formalizes top management's support and articulates the organization's commitment to energy efficiency for employees, shareholders, the community and other stakeholders.

A formal written energy policy acts both as:

- A public expression of the organization's commitment to energy conservation and environmental protection
- A working document to guide the energy management practices and provides continuity.

It is in the company's best interest that support for energy management is expressed in a formal written declaration of commitment accompanied by a set of stated objectives, an action plan for achieving them, and a clear specification of responsibilities.

Typical Format of an Energy Policy

- Declaration of top management's commitment to, and senior and middle management's involvement in, energy management.
- Statement of policy.
- Statement of objectives, separated into short and long-term goals.

Actions

- Have the CEO or head of the organization officially issue the policy
- Involve key people in policy development to ensure cooperation
- Tailor the policy to the organization's culture
- Make it understandable to employees and public alike
- Consider the skills and abilities of management and employees
- Include detail that covers day-to-day operations
- Communicate the policy to all employees, and encourage them to get involved

Sample energy policies of various organizations are given at the end of this chapter.

5.2.2 Assess Energy Performances

Understanding current and past energy use helps an organization identify opportunities to improve energy performance and gain financial benefits. Assessing energy performance is the periodic process of evaluating energy use for all major facilities and functions in the organization and establishing a baseline for measuring future results of energy efficiency efforts.
Key aspects include data collection and management, establishing baseline, benchmarking, analysis and evaluation and conducting technical assessment and audit.

Data Collection and Management

Collect and track data -Collect energy use information and document data over time.
Evaluating energy performance requires good information on how, when, and where energy is being used. Collecting and tracking this information is necessary for establishing baselines and managing energy use.

The following steps are to be considered

a) Collect data

The data must be complete and accurate because it will be used for analysis and goal setting. Consider the following when collecting energy use data:

Determine appropriate level of detail -The level and scope of data collection will vary from organization to organization. Some may choose to collect data from submeters on individual processes while others may only look at a utility bill.

Account for all energy sources - Make inventory of all energy purchased and generated on-site (electricity, gas, steam, waste fuels) in physical units (kWh, kg of steam, etc.) and on a cost

basis.

Document all energy uses -For the sources identified above, assemble energy bills, meter readings, and other use data. Energy data may reside in the accounting department, be held centrally or at each facility, or can be acquired by contacting the appropriate utilities or energy service providers. Gather at least two years of monthly data or a more frequent interval if available. Use the most recent data available.

Collect facility and operational data -To be able to normalize and benchmark, it may be necessary to collect non-energy related data for all facilities and operations, such as building size, production, operating hours, etc.

b) Track Data

A system for tracking performance can range from a simple spreadsheet to detailed databases and IT systems. In developing an appropriate tracking system for the organization, consider the following:
Scope -The design of the tracking system will be shaped, in large part, by the level and scope of information that will be tracked and the frequency of data collection.

Maintenance -Tracking systems must be easy to use, update, and maintain.

Reporting and communicating -Use tracking systems to communicate energy performance to other parts of the organization and motivate change. Consider developing formats that express energy performance information in ways that are easily understandable across the organization. A good tracking system should make such reporting easy.

Actions

- Collect data by fuel type at an individual building or facility level
- Collect data from submeters, if possible
- Use data that is current and timely
- Use tracking systems to develop quarterly and annual reports that profile energy performance
- Use tracking systems to allow facilities to compare their performance to their peers

c) Normalize Data

The energy use of facilities varies greatly, partly due to factors beyond the energy efficiency of the equipment and operations. These factors may include weather or certain operating characteristics. Normalizing is the process of removing the impact of various factors on energy use so that energy performance of facilities and operations can be compared.

In order to normalize:

Determine normalization factors -Determine key factors that need to be addressed to effectively compare facilities. Relevant factors are frequently organization-specific.

For industrial facilities common normalization factors include:

- Inputs

- Product type
- Output
- Production processes

For commercial and institutional buildings, common normalization factors include:

- Climate zone
- Facility size
- Fuel choice
- Price/cost of energy
- Actual weather history
- Hours of operation
- Occupancy levels
- Special features

Establishing Baseline

Establish baselines -Determine the starting point from which to measure progress.

Measuring energy performance at a specific time establishes a baseline and provides the starting point for setting goals and evaluating future efforts and overall performance. Baselines should be established for all levels appropriate to your organization.

The main steps involve using the data collected so far to:
Establish base year -Establish a base year or an average of several historical years. Use the most complete and relevant sets of data available.

Identify metrics -Select units of measurements that effectively and appropriately express energy performance for the organization. (e.g. kCal/ton, kCal/kWh, total energy cost/ton).

Publish results -Announce performance baselines to facilities, managers, and other key stakeholders in your organization.

Benchmark

Compare the energy performance of facilities to each other, peers and competitors, and over time to prioritize which facilities to focus on for improvements

Benchmarking allows us to compare the energy performance of similar facilities or an established level of performance. It is a useful activity in energy management because it can be used to develop relative measures of energy performance, track change over time, and identify best energy management practices. Benchmarking can be done in variety of ways. Facility or organizational performance may be benchmarked to:

Past performance -A comparison of current versus historical performance.

Industry average -Based on an established performance metric, such as the recognized average performance of a similar group.

Best in class -Benchmarking against the best in the industry and not the average.

Best Practices -A qualitative comparison against certain, established practices considered to be the best in the industry.

The key steps in benchmarking include:

- Determine the level of benchmarking (for example -equipment, process line, facility or organizational).
- Develop metrics.
- Conduct comparisons.
- Track performance over time.

Analysis and Evaluation

Analyse Data -Understand your energy use patterns and trends.

Analysing data to determine energy use trends can help an organization gain a better understanding of the factors that affect energy performance and identify steps for reducing energy consumption.

Assessing your energy performance helps you to:

- Categorize current energy use by fuel type, operating division, facility, product line, etc.
- Identify high performing facilities for recognition and reuse of best practices.
- Prioritize poor performing facilities for immediate improvement.
- Understand the contribution of energy expenditures to operating costs.
- Develop a historical perspective and context for future actions and decisions.
- Establish reference points for measuring and rewarding good performance.

There are a variety of ways by which data can be analyzed depending upon the needs of the organization. The following analyses provide a guideline:

a) Quantitative Reviews

- **Develop use profiles** -Identify energy consumption peaks and valleys, and determine how they relate to operations or key events.
- **Compare performance** -Compare the use and performance data of similar facilities in your industry.
- **Assess the financial impacts** -Identify areas of high-cost energy use.
- **Identify data gaps** -Determine areas where more information is needed.

b) Qualitative Reviews

- **Conduct interviews** -Seek informed opinions from colleagues, lessons learned, systems-specific information (e.g., HVAC, lighting, refrigeration), and in-house audits or surveys.
- **Review policies and procedures** -Review organizational policies and operating procedures to determine their impact on energy use.

Conduct Technical Assessments & Audits

Evaluate the operating performance of facility systems and equipment to determine improvement potential.

Knowing the organization's baseline energy use and the relative performance of entire portfolio is only part of the information needed. Periodic assessment of the performance of equipment, processes, and systems will help to identify opportunities for improvement.

Energy audits are comprehensive reviews conducted by energy auditors and/or engineers that evaluate the actual performance of a facility's systems and equipment against its designed performance level or against best available technology. The difference between these is the potential for energy savings.

The main steps for conducting technical assessments and audits are:

Assemble audit team -Expertise should cover all energy-using systems, processes, and equipment. Include facility engineers, system specialists, and other support. Outside support may be helpful and provide an objective perspective or specific expertise.

Plan and develop an audit strategy -Identify and prioritize systems for evaluation, assign team members to tasks, and schedule completion dates for the activities. Use benchmarking results to identify poor-performing facilities whose equipment and systems should be targeted for evaluation.

Create audit report -Based on the audit results, produce a detailed summary of actual steps that can be taken to reduce energy use. The report should recommend actions ranging from simple adjustments in operation to equipment replacement. Estimates of resource requirements for completing actions should also be included.

5.2.3 Set Goals

Performance goals drive energy management activities and promote continuous improvement. Setting clear and measurable goals is critical for understanding intended results, developing effective strategies, and reaping financial gains.

Well-stated goals guide daily decision-making and are the basis for tracking and measuring progress. Communicating and posting goals can motivate staff to support energy management efforts throughout the organization. The Energy Manager in association with the energy team typically develops goals.

Setting goals helps the Energy Manager:

- Set the tone for improvement throughout the organization
- Measure the success of the energy management program
- Help the Energy Team to identify progress and setbacks at a facility level
- Foster ownership of energy management, create a sense of purpose, and motivate staff.
- Demonstrate commitment to reducing environmental impacts
- Create schedules for upgrade activities and identify milestones
- Tool called force field analysis can be used to clarify the goals to be achieved.

To develop effective performance goals, determine scope, estimate potential for improvement and finally establish goals.

Determine Scope

Identify organizational and time parameters for goals.

The scope of performance goals can include multiple levels of the organization as well as various time periods for completion of specific goals.

a) Organizational level
The level at which performance goals will be set depends on the nature of the organization and how it uses energy. Common organizational levels for setting goals include:

Organization wide -Setting goals at this level provides a big picture of how the entire organization wants to improve. Organization-wide goals provide a framework for communicating the success of energy management both internal and external audiences.

b) Facility -At this level, goals may vary to take into account the performance of specific facilities based on benchmarking results or an energy audit. Facility level goals are designed to help the broader organization to meet its goals.

c) Process or equipment -Some organizations may find it useful to establish goals for specific process lines and equipment when energy use is concentrated in specific areas.

Time Periods

Establishing appropriate and realistic target dates for goals ensures that they are meaningful and promote change. A combination of short and long term goals can be effective.

a) Short-term goals -Annual goals provide the necessary markers for tracking and reporting progress on a regular and on going basis.

b) Long-term goals -Long-term goals are usually organization-specific and may be shaped by:
- Internal rates of return
- Internal planning horizons and guidelines
- Organizational strategic plans
- Commitments to voluntary environmental initiatives

Estimate Potential for Improvement

Review baselines, benchmark to determine the potential and order of upgrades, and conduct technical assessments and audits.

To set goals, it is important to have a good estimate of what level of performance is achievable and the amount of resources needed.

There are a variety ways to determine potential. The method we choose will depend on a number of factors, such as: available resources, time, the nature of energy use at your facilities, and how the energy program is organized.

Methods used by leading energy programs include:
Reviewing performance data -Assessing performance and setting baselines should help to identify differences in energy use between similar facilities, giving a limited, point-in-time view of your potential improvement. Performance data covering a longer period of time will be more useful for understanding improvement potential.

Benchmarking -Benchmarking provides a yardstick for evaluating improvement opportunity when enough data is available to show trends in energy use.

Evaluating past projects and best practices -Evaluate past projects and best practices at higher-performing facilities to determine the feasibility of transferring these practices to other parts of the organization.

Reviewing technical assessments and audits -Identify opportunities to reduce energy use identified during technical assessments and audits of poorer performing facilities to serve as a strong basis for quantifying the potential for improvement.

Comparing goals of similar organizations -Reviewing performance goals of other organizations can help to guide and inform you of the potential for your own organization.

Linking to organization-wide strategic goals -Strategic as well as operational goals, such as cost reductions, can also help inform the goal setting process

Establish Goals

Create and express clear, measurable goals, with target dates, for the entire organization, facilities, and other units.

Once the potential for improvement has been estimated, goals can be established at the appropriate organizational levels. Energy performance goals should be formally established and recognized by senior management as a mission for the whole organization.

Estimating potential for improvement should provide us with a starting point for what is possible. However, some organizations set their final energy performance goals based on organizational factors other than what is technically feasible. Such factors will affect how energy performance goals are expressed.

Common ways for establishing goals include:

Defined reduction -Goals are presented in terms of a specific quantity or percentage decrease in energy use, such as decrease of 300 tons of furnace oil or10 percent reduction of furnace oil.

Best-in-class -This goal aims for a certain level of performance compared to an established benchmark.

Efficiency improvement -Goals are expressed as a function of reducing the energy intensity of a specific performance indicator, such as 5 kWh per unit of product.

Environmental Improvement - This goal translates energy savings into pollution prevention or reduction goals.

Actions

When setting goals, be sure to use the Energy Team's wide range of knowledge to help set aggressive, yet realistic goals.

Have management review your goals to enlist their feedback and support.

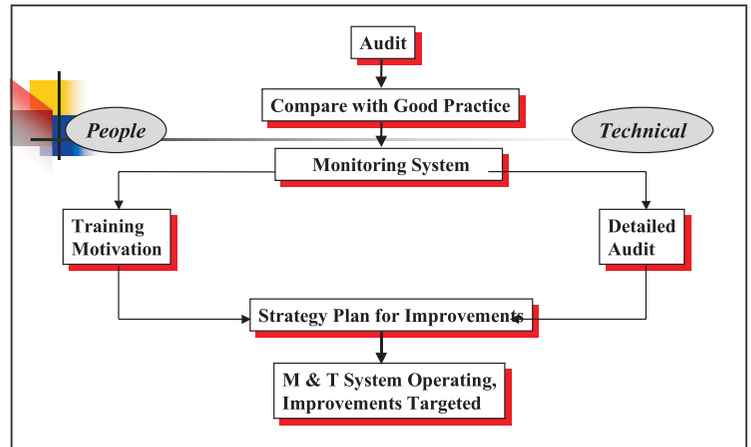


Figure 5.4 Strategy Plan

Force Field Analysis

Before creating the action plan, it can be a useful exercise to clarify the goal to be achieved, and to assess what barriers must be overcome and what influences exist in the organization that work towards the achievement of the goal. These barriers and influences can be thought of as negative and positive forces respectively. Force field analysis is a simple tool that can be used to gain additional insight about the change process to be pursued. The steps involved in force field analysis are:

State the organizational goal and indicate the direction (say, left to right) that signifies moving towards that goal: for example, the goal might be "improve energy efficiency in the assembly plant" or "reduce energy consumption in the facility for current occupancy levels".

Identify barriers that tend to work against the achievement of the goal: these may be internal to the organization (for example, a lack of expertise related to energy management) or external (for example, energy rate structures or government regulation).

Identify positive influences or forces that tend to work towards achievement of the goal; these may also be internal or external.

Estimate the relative strength of the negative and positive forces (for simplicity, we may want to identify them as low, medium and high strength).

Prioritize those forces that can be strengthened or weakened through your action plan with the greatest effect on achieving the goal (Tip: It is usually more effective to attempt to minimize negative forces than to try to strengthen forces that are already positive). A typical force field analysis chart is shown in Figure 5.5.

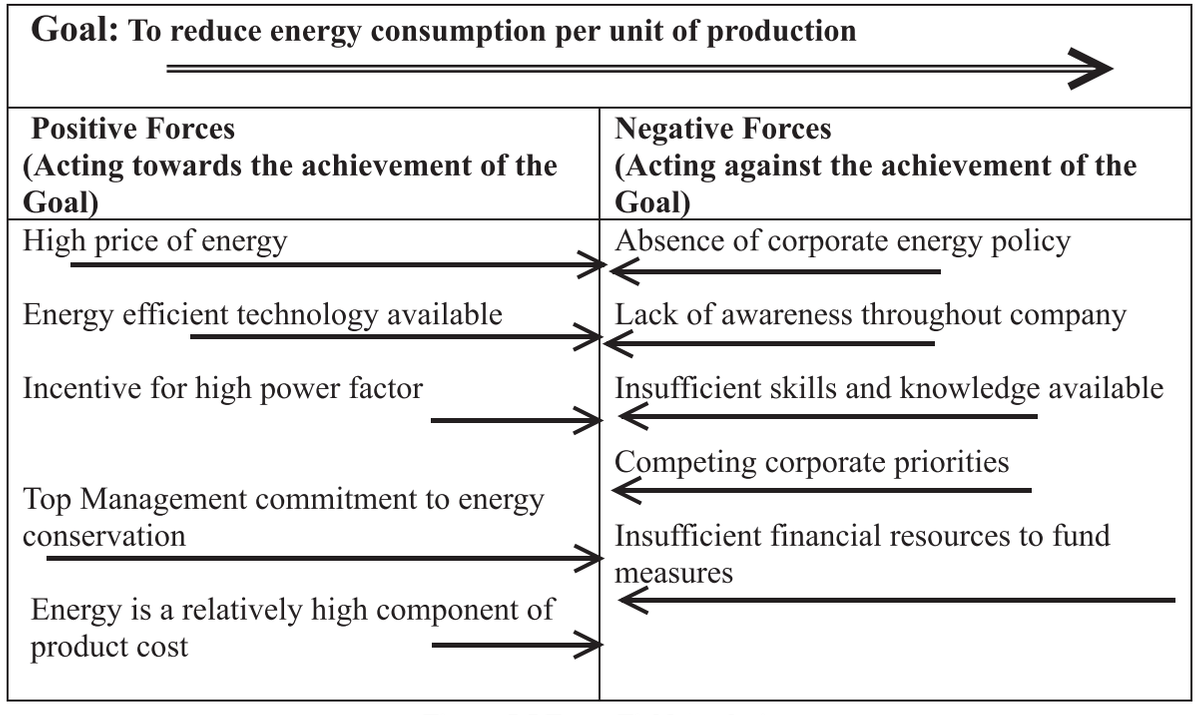


Figure 5.5 Force Field Analysis

5.2.4 Create Action Plan

With goals in place, the organization is now ready to develop a roadmap to improve energy performance.

Successful organizations use a detailed action plan to ensure a systematic process to implement energy performance measures. Unlike the energy policy, the action plan is regularly updated, most often on an annual basis, to reflect recent achievements, changes in performance, and shifting priorities.

While the scope and scale of the action plan is often dependent on the organization, the steps below outline a basic starting point for creating a plan.

Define Technical Steps and Targets

Evaluate technical assessments and audit results -Identify gaps between current performance and goals, by reviewing the results of the technical assessments and audits or progress evaluations.

Determine technical steps -Identify the steps necessary for upgrading and moving facilities from current performance to the desired level of performance as defined by the goals.

Create performance targets for each facility, department, and operation of the organization to track progress towards achieving goals.

Set timelines for actions, including regular meetings among key personnel to evaluate progress, completion dates, milestones and expected outcomes.

Establish a tracking system to track and monitor the progress of action items. This system should track and measure energy use and project/program activities.

Determine Roles and Resources

Get agreement from management and all organizational areas affected by the action plan before finalizing it. Work with the Energy Team to communicate the action plan to all areas of the organization.

Determine Roles

Identify internal roles -Determine who should be involved and what their responsibilities will be. Depending on your organization and action plan, this might include departments such as:

- Facility and operations management
- Financial management -capital investments, budget planning
- Human resources -staffing, training, and performance standards
- Maintenance
- Supply management -procurement procedures, energy purchasing and equipment and materials
- Building and plant design
- Engineering
- New product/process development teams
- Communications Marketing
- Environment, Health and Safety

Identify external roles -Determine the degree to which consultants, service providers, vendors, and other product providers will be used. Some organizations may choose to outsource entire aspects of their action plan while others may only want to contract with specific vendors for limited projects.

Establish performance metrics for contractors -If contractors will be used, determine what standards will be used to evaluate bids and incorporate these metrics into agreements with contractors.

Determine Resources

Define resources needs -For each project or program in the action plan, estimate the cost for each item in terms of both human resources and capital/expense outlay.

Secure resources -Develop the business case for justifying and gaining funding approval for action plan projects and resources need.

Actions

Creating an inclusive strategy that establishes roles and actions throughout the organization can help to integrate good energy management practices. When developing an action plan, consider:

- Brainstorming with various departments to identify ways they can contribute.
- Holding a competition to seek ideas for energy efficiency from across the organization.
- Gathering recommendations from the Energy Team and other key personnel.

5.2.5 Implement Action Plan

People can make or break an energy program. Gaining the support and cooperation of key people at different levels within the organization is an important factor for successful implementation of the action plan in many organizations.

Reaching your goals frequently depends on the awareness, commitment, and capability of the people who will implement the projects defined in the action plan.

In addition to implementing the technical aspects of the action plan, consider the following:

- Create communication plan -Develop targeted information for key audiences about your energy management program.
- Raise awareness -Build support at all levels of your organization for energy management initiatives and goals.
- Build capacity -Through training, access to information, and transfer of successful practices, procedures, and technologies, you can expand the capacity of your staff.
- Motivate -Create incentives that encourage staff to improve energy performance to achieve goals.

- Track and monitor -Using the tracking system developed as part of the action plan to track and monitor progress regularly.

Create a Communication Plan

Good communication does not just happen. It requires careful planning and implementation.

To communicate strategically, you will need to identify key audiences, determine the information that they need, and adapt your messages appropriately for each one.

Raise Awareness

Everyone has a role in energy management. Effective programs make employees, managers, and other key stakeholders aware of energy performance goals and initiatives, as well as their responsibility in carrying out the program.

Communications strategies and materials for raising awareness of energy use, goals and impacts should be tailored to the needs of the intended audience. To raise awareness, consider doing the following:

a) Increase general energy awareness

Most people are unaware of how their everyday actions and activities at home and work affect energy use and impact the environment. Increasing overall awareness can be an effective way to gain greater support for energy initiatives.

Increasing general awareness of energy use can be accomplished through:

New employee orientation programs -Provide basic information on organizational and individual energy use to new employees.

Poster campaigns -Develop attractive and informative posters for change rooms, bulletin boards, etc, that discusses energy use.

b) Improve facility energy awareness

Individuals working in or even managing a facility may have little understanding of the energy performance of the facility or its impact on the organization and environment. Targeted efforts designed to increase awareness of facility energy use can help build support for energy management programs. Like general awareness efforts, facility-oriented energy awareness can take many forms. In developing facility energy awareness programs, consider using the following types of information:

Energy data statistics -Use general facility energy facts and Figures, such as overall energy costs, costs to operate equipment, environmental information related to energy use, and so on.

Energy use of equipment -Provide information on the energy performance of equipment or processes that employees regularly use as part of their jobs.

c) Gain management support

Frequently, managers who are not directly involved in energy management are not aware of how energy use effects the organization. Increasing the awareness of managers can help to build support for energy management initiatives.

Build Capacity

Investing in training and systems to share successful practices helps ensure the success of the action plan by building the overall organizational capacity. Many organizations have found that informed employees are more likely to contribute ideas, operate equipment properly, and follow procedures, helping to guarantee that capital investments in energy improvements will realize their potential.

Training

Using training to help staff understand the importance of energy performance provides the information necessary to make informed decisions. Training also provides an excellent opportunity for gathering employee feedback and evaluations. The type and nature of training will vary by organization and your specific action plan. Common training programs include:

Operational and procedural training -Provides instruction on new operating methods or procedures designed to reduce energy use. Such training is typically targeted towards specific audiences, such as facility managers, operations, and maintenance staff.

Administrative training -Includes reporting, monitoring, data collection, and other administrative efforts that support energy management.

Specialized training -Gives specific instructions on using and maintaining equipment or tools to ensure more efficient operation.

Knowledge and Management Information Systems

Computer-based information systems provide a robust means for sharing information on best practices, technologies, and operational guidance. While these systems can range from complex databases to a simple intranet site, they are a centralized and accessible place to store and transfer energy management information within an organization.

Motivate

Offering incentives for energy management is one way many organizations create interest in energy initiatives and foster a sense of ownership among employees.

Examples of how organizations motivate staff and employees include:

Internal competition: Use tracking sheets, scorecards, etc. to compare performance of similar facilities and foster a sense of competition.

Recognition: Highlight and reward accomplishments of individuals, departments, and facilities.

Financial bonus and prizes: Offer cash bonuses and other rewards if goals are met.
Environmental responsibility: Use environmental messages to promote a sense of environmental and social responsibility.

Financial responsibility: Use financial messages to promote a sense of fiduciary responsibility.

Performance standards: Tie employee performance standards to energy goals.

Track & Monitor

A tracking system is the means by which an energy program's activities are monitored. The system should be centralized and available for all to use in gauging progress toward established targets, milestones, and deadlines.

Maintaining a tracking system enables you to assess necessary steps, corrective actions, and identify successes. Periodic review of the activities outlined in the action plan is critical to meet energy performance goals.

Perform regular updates -A system is only effective if the information it contains is current and comprehensive. Data needs to be collected and incorporated into the system at an interval of time effective to the program. Many organizations perform weekly and monthly updates to their tracking systems.

Conduct periodic reviews -Periodic reviews of your progress in meeting interim goals and milestones should be conducted with the management team, the energy team, and selected groups of employees. The frequency of these reviews will vary depending upon the audience. Such reviews should focus on progress made, problems encountered, and potential rewards.

Identify necessary corrective actions -A tracking system is a good way to determine whether a program is performing well. It will help identify when a specific activity is not meeting its expected performance and is in need of review.

5.2.6 Evaluate Progress

Evaluating progress includes formal review of both energy use data and the activities carried out as part of the action plan as compared to your performance goals.

Key aspects are measuring results and reviewing action plans.

Measure results

Compare current performance to established goals. Gather energy use data and compare results to goals to determine accomplishments.

Key steps in measuring results include:

Gather tracking data

- Review energy use and cost data (capital and operating expenses)
- Organize reports and data from tracking and monitoring efforts
- Analyze energy efficiency achievements based on your established performance metrics.

Benchmark

- Compare energy performance to baselines
- Compare performance against established goals for:
    - environmental performance
    - financial savings

Compare energy performance to peers and competitors to establish a relative understanding of where your performance ranks

Review action plan

Understand what worked well and what didn't in order to identify best practices.

After reviewing performance data, the next steps are to understand the factors affecting the results as well as the additional benefits of the improved energy performance.

Regular evaluation of energy performance and the effectiveness of energy management initiatives also allow energy managers to:

- Measure the effectiveness of projects and programs implemented
- Make informed decisions about future energy projects
- Reward individuals and teams for accomplishments
- Document additional savings opportunities as well as non-quantifiable benefits that can be leveraged for future initiatives.

This review should look at the effectiveness of your action plan. Where activities and projects were successful, document best practices to share throughout the organization.

Where goals were not met, many organizations determine the cause and decide what corrective or preventive actions should be taken.

Key steps in reviewing the action plan include:

Get feedback -Get feedback and ideas on the plan from the energy team, implementation staff, and other departments.

Assess awareness -Assess changes in employee and organizational awareness of energy issues.

Identify critical factors -Identify factors that contributed to surpassing or missing targets.

Quantify side benefits -Identify and quantify, if possible, side benefits arising from energy management activities such as employee comfort, productivity improvement, impact on sales, reduced operation and maintenance expenses, or better public/community relations.
Action plan review involves a commitment of resources, but also has many advantages:

- Creates insight for new actions (technologies/practices/programs)
- Avoids repeating failures by identifying activities that were not as effective as expected
- Assesses the usefulness of the tracking system and other administrative tools to ensure better management and evaluation
- Provides staff the opportunity to contribute to and understand the process of energy management
- Provides specific success stories and financial results to communicate to stakeholders inside and outside the organization.

5.2.7 Recognize Achievements

Providing and seeking recognition for energy management achievements is a proven step for sustaining momentum and support for your program.

Providing recognition to those who helped the organization achieve these results motivates staff

and employees and brings positive exposure to the energy management program.

Receiving recognition from outside sources validates the importance of the energy management program to both internal and external stakeholders, and provides positive exposure for the organization as a whole.

a) Internal Recognition

Recognizing the accomplishments of individuals and teams is key to sustaining support and momentum for energy management initiatives. Rewarding particular efforts sets the example for what constitutes success and helps motivate employees through increased job satisfaction. Recognition can strengthen the morale of everyone involved in energy management.

Key steps are:

Determine recognition levels -The decision about who should receive recognition in your organization will likely be shaped by the purpose for providing recognition and your organizational culture. Common recognition levels include:

Individual -Acknowledges the contributions and accomplishments of specific people.

Teams -Recognizes the achievements of teams, departments, and other distinct groups within the organization.

Facility -Rewards the accomplishments or performance of an entire facility.

Establish recognition criteria -Create criteria for recognition and communicate these criteria and any process eligibility requirements. Recognition criteria might include thresholds of achievement such as:

- Offered the best energy savings ideas
- Achieved the greatest energy use reduction
- Increased savings by quantified amount

Determine recognition type

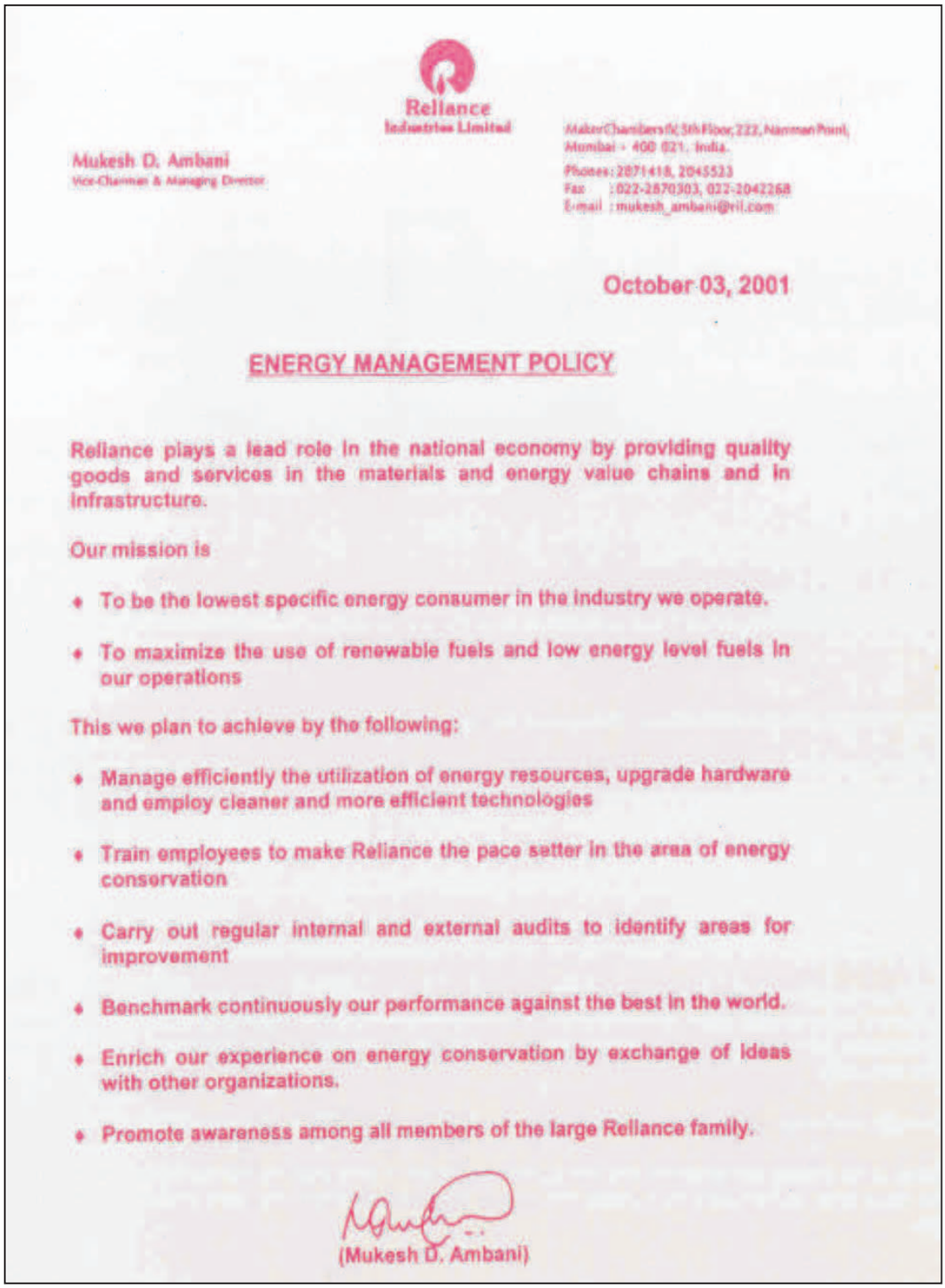
There are a variety of ways to provide recognition and rewards. Depending on the purpose of the recognition program and your organizational culture, forms of recognition can range from formal acknowledgements and certificates, to salary increases and cash bonuses, to simple forms of appreciation such as shields or energy program shirts.

Actions

- Ask senior management to provide the recognition.
- Use a formal means for providing recognition, such as an award ceremony.
- Use progress evaluations to inform the recognition process.

b) External Recognition

Good work deserves to be acknowledged. Recognition from a third party can provide validation for an organization's energy management program. Not only does it provide satisfaction to those involved in earning the recognition, but it can also enhance an organization's public image. A solid reputation contributes to your competitive advantage by making your organization more attractive to customers, students, current and potential employees, lenders, business partners and other stakeholders.



Reliance
Industries Limited

Maker Chambers IV, 5th Floor, 222, Nariman Point,
Mumbai - 400 021. India.
Phones: 2871418, 2045523
Fax : 022-2870303, 022-2042268
E-mail : mukesh_ambani@ril.com

Mukesh D. Ambani
Vice-Chairman & Managing Director

October 03, 2001

ENERGY MANAGEMENT POLICY

Reliance plays a lead role in the national economy by providing quality goods and services in the materials and energy value chains and in infrastructure.

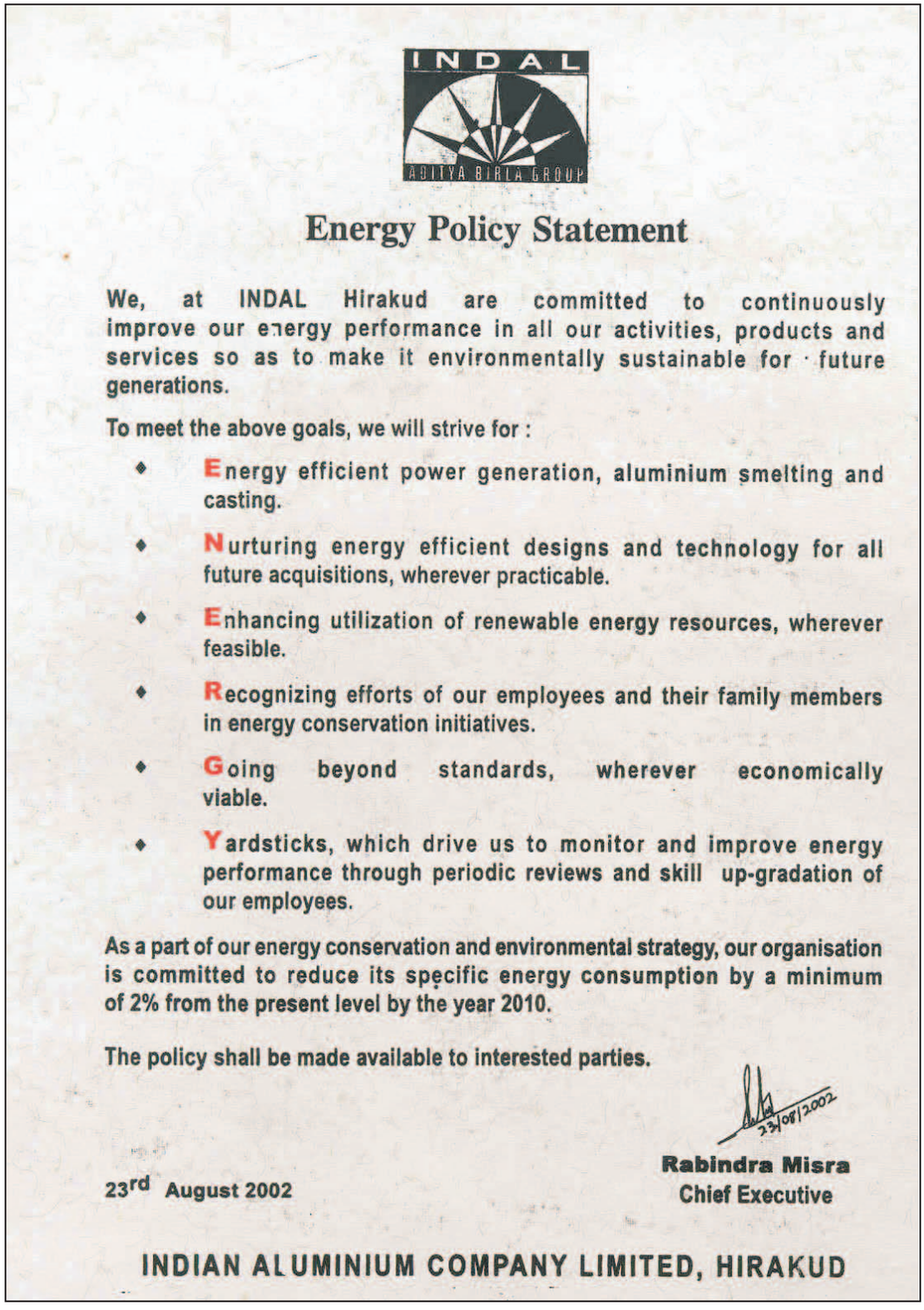
Our mission is

- To be the lowest specific energy consumer in the industry we operate.
- To maximize the use of renewable fuels and low energy level fuels in our operations

This we plan to achieve by the following:

- Manage efficiently the utilization of energy resources, upgrade hardware and employ cleaner and more efficient technologies
- Train employees to make Reliance the pace setter in the area of energy conservation
- Carry out regular internal and external audits to identify areas for improvement
- Benchmark continuously our performance against the best in the world.
- Enrich our experience on energy conservation by exchange of ideas with other organizations.
- Promote awareness among all members of the large Reliance family.

(Mukesh D. Ambani)



INDAL

ADITYA BIRLA GROUP

Energy Policy Statement

We, at INDAL Hirakud are committed to continuously improve our energy performance in all our activities, products and services so as to make it environmentally sustainable for future generations.

To meet the above goals, we will strive for :

- **E**nergy efficient power generation, aluminium smelting and casting.
- **N**urturing energy efficient designs and technology for all future acquisitions, wherever practicable.
- **E**nhancing utilization of renewable energy resources, wherever feasible.
- **R**ecognizing efforts of our employees and their family members in energy conservation initiatives.
- **G**oing beyond standards, wherever economically viable.
- **Y**ardsticks, which drive us to monitor and improve energy performance through periodic reviews and skill up-gradation of our employees.

As a part of our energy conservation and environmental strategy, our organisation is committed to reduce its specific energy consumption by a minimum of 2% from the present level by the year 2010.

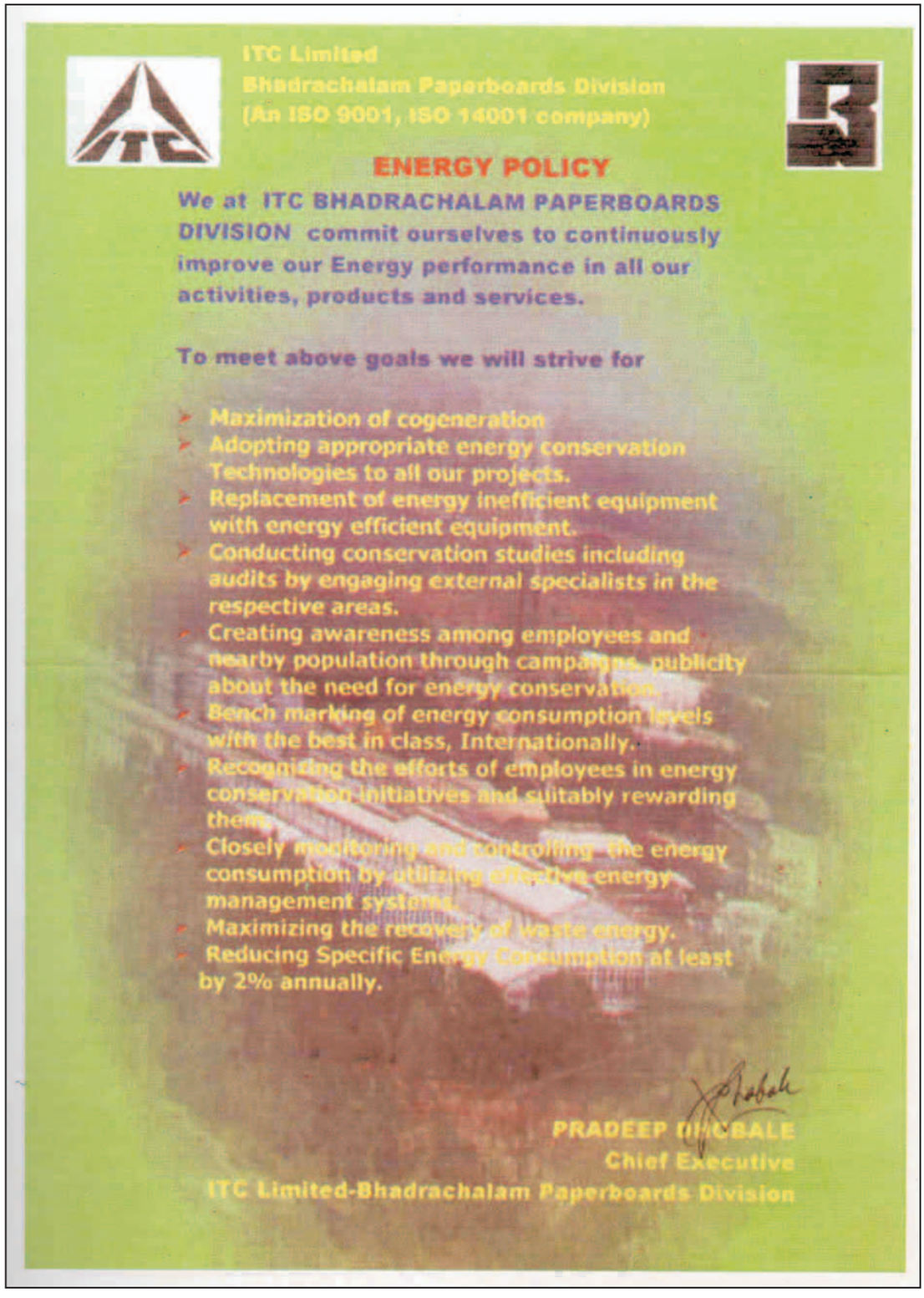
The policy shall be made available to interested parties.

23/08/2002

Rabindra Misra
Chief Executive

23rd August 2002

INDIAN ALUMINIUM COMPANY LIMITED, HIRAKUD


ITC Limited
Bhadrachalam Paperboards Division
(An ISO 9001, ISO 14001 company)
ENERGY POLICY
We at ITC BHADRACHALAM PAPERBOARDS DIVISION commit ourselves to continuously improve our Energy performance in all our activities, products and services.
To meet above goals we will strive for
Maximization of cogeneration
Adopting appropriate energy conservation Technologies to all our projects.
Replacement of energy inefficient equipment with energy efficient equipment.
Conducting conservation studies including audits by engaging external specialists in the respective areas.
Creating awareness among employees and nearby population through campaigns, publicity about the need for energy conservation.
Bench marking of energy consumption levels with the best in class, Internationally.
Recognizing the efforts of employees in energy conservation initiatives and suitably rewarding them.
Closely monitoring and controlling the energy consumption by utilizing effective energy management systems.
Maximizing the recovery of waste energy.
Reducing Specific Energy Consumption at least by 2% annually.
PRADEEP DHOBALE
Chief Executive
ITC Limited-Bhadrachalam Paperboards Division

ENERGY MANAGEMENT POLICY

Tata Chemicals Limited
Fertilizer Division, Babrala

M/s Tata Chemicals Limited in it's endeavour to play leading role in the important economic issue of our Nation, it is committed and continually striving to be the l owest specific energy consumer in the industry it operates.

At Babrala we believe that Communication, Culture and Commitment are the key driving forces for us in making Energy Conservation (ENCON) a way of life at our plant. We plan to achieve this by following:

- Manage efficiently the utilization of energy resources (like Natural gas, Naphtha, HSD), updating hardware, operational practices and employ cleaner and more efficient technology as appropriate.
- Train and educate our Employees/Residents to be the trendsetter in the areas of ENCON.
- Carry out regular internal and external audits to identify and communicate areas of improvements and benchmark continuously our performance against the world best, to identify the ENCON opportunities.
- Share and enrich our experiences on energy conservation with other organization, and own group companies.

As a part of ENCON strategy, Babrala is committed to reduce our specific energy consumption of urea @ 1.0% minimum every year till 2007, by promoting the culture of innovation and creativity, and aligning the commitment at all levels.

Date: 18th April, 2003
Place: TCL, Babrala

P M Khanderia
General Manager-Operations

ENERGY POLICY

(Hindalco Industries Limited)

As a way of life, we, the employees of Hindalco Industries Limited are committed and pledge to conserve Energy judiciously in all our activities, products and services across the organization. We shall ende avour to transform energy conservation into a strategic business goal fully aligning with technological advancements by improving the skill and knowledge of our employees for sustainable development.

To achieve excellence, our objectives therefore will be:

- to reduce specific energy consumption in all our operations and activities.
- to produce high purity metal with high conductivity to achieve minimum power losses.
- to conserve fossil fuels through enhanced use of renewable energy/recovered waste energy.
- to adopt energy efficient technologies/equipment for all new projects
- to ensure energy conservation awareness programme throughout the organization
- to recognize efforts of our employee and their family members in energy conservation initiatives
- to replace old energy inefficient technology/equipment with the latest energy efficient state of art technology / equipment continually.
- to control energy consumption by periodic review and improving our processes by motivation and training practices.
- to sustain energy efficiency gains by establishing and maintaining a management information system designed to support managerial decision-making.
- to conduct regular management reviews to ensure continual improvement and achieve of our goal.

Date:10.8.02

A.K. Agarwala
Director (whole time)

Rashtriya Ispat Nigam Limited
Visakhapatnam Steel Plant

ENERGY POLICY

We, at Visakhapatnam Steel Plant, are committed to optimally utilise various forms of energy in a cost effective manner to effect conservation of energy resources. To accomplish this we will :

- Monitor closely and control the consumption of various forms of energy through an effective Energy Management System.
- Adopt appropriate energy conservation technologies.
- Maximise the use of cheaper and easily available forms of energy.
- Make energy conservation a mass movement with the involvement of all employees.
- Maximise recovery of waste energy.
- Reduce Specific Energy Consumption by 1% per year by 2010.

Date
14-06-2002

Dr. B.N. Singh
Chairman-cum-Managing Director

KESORAM RAYON
(Division of Kesoram Industries Ltd.)
ENERGY POLICY

We shall strive for continuous energy economy through -

- Formulation of overall energy strategy and targets.
- All round participation of all employees through Small Group Activities
- Improved capacity utilization
- Upgradation of process, technology and equipment
- Better plant layout

As a part of our energy conservation and environment protection, we are committed to reduce specific energy consumption by 1% every year till 2010.

J.D. PALOD
President

NRC LIMITED

ENERGY CONSERVATION POLICY

NRC Limited is committed to energy conservation for all its products & related operations. Efforts will be made to reduce energy consumption in every possible ways as under:

- Replacing old & outdated machinery, equipment by new energy efficient equipment
- Benchmarking all products/services for energy consumption by comparison at regional as well as national level
- Conducting energy conservation studies including audits with a view to minimise waste.
- Creating awareness among employees &nearby population through campaigns, publicity about need for energy conservation
- We are committed to reduce our energy consumption by minimum 1% every year till 2010.

P.S. Sharma
Managing Director

Maral Overseas Limited
P.O.Maral Sarovar, A.B.Road
Khalbujurg - 451660
District Khargone (M.P.)

ENERGY CONSERVATION POLICY

We are committed to conserve the energy which is a scarce resource with the requisite consistency in the efficiency, effectiveness in the cost involved in the operations and ensuring that production quality and quantity, environment, safety, health of people are maintained.

We are also committed to monitoring continuously the saving achieved and reduce its specific energy consumption by minimum of 1% every year.

M S. ANJANE
PRESIDENT

QUESTIONS	
1.	What are the prerequisites of the successful energy management programme?
2.	Why is the top management support essential for success of energy management?
3.	Explain the steps involved in the force field analysis. Taking your own industry as an example, list down the positive and negative forces?
4.	Should an industry have energy policy? If yes or no, explain the reason.
5.	Discuss briefly as to where the energy manager should be located in the organization structure?
6.	What is the role of top management in energy management?
7.	List down the responsibilities and duties of an energy manager in an industry?
8.	Explain how accountability can be established at various levels in an energy management system?
9.	List from your experience/thinking how employees can be motivated?
10.	What are the requirements of good energy action planning?
11.	Discuss the importance of training for effective energy management.
12.	Explain the key features of energy information system. Taking your own industry as an example, list down the important data you would like to collect and monitor for effective energy management.
13.	What is the barrier to the use of energy information systems?
14.	How is communication important for energy manager?

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