

Electronic Information Processing in the Cement Industry

The information revolution, owing to its numerous advantages, is rapidly sweeping across the Indian industrial sector. The organized cement industry has quickly moved fast to usher in technological transformation and automation in its operations

The Indian cement industry has systematically reduced its energy consumption over the last 20 years and is constantly looking for options for further reductions with the help of its own energy experts (see The BEE August 2000, Vol I. Issue 1, pg. 12–13). There is a need to streamline and optimize data collection and analysis, and ensure easy and instant access to it for industry members and others interested in the sector. The Indo-German Energy Efficiency Project (IGEEP) plans to enhance cooperation in this area with the dual objectives of assisting the Cement Manufacturers Association, as well as the Bureau of Energy Efficiency (BEE), the nodal agency to be established under the Energy Conservation Bill.

Energy Conservation Bill

The Energy Conservation Bill, as introduced in the Indian Parliament incorporates certain reporting requirements for selected energy intensive industries. The aim is to assist the industry in improving data collection and analysis in an innovative way resulting in financially attractive energy savings. The ultimate objective of asking selected industries to provide, on a regular basis, relevant, detailed, consistent and accurate data about their energy consumption and other production parameters, is to provide a benchmark for comparison. Further, this would enable other members, particularly the less efficient ones, to understand their energy cost reduction potential, and formulate conservations strategies.

The Present Situation

The conventional method of data collection has several shortcomings. It is time consuming and expensive to mail out forms, receive the information, check its consistency, completeness and accuracy, analyze it, store it somewhere and finally give useful feedback to the firm.

- As experience in other countries shows, it would take one person to handle 50 firms. Considering an estimated 5,000 industrial firms, a staff force of 100 would be necessary to oversee just one part of the act, viz, mandatory reporting of certain parameters related to energy efficiency in industrial production.
- Manual analysis of data and comparison with other thousands of entries is prone to mistakes, and would require extensive encoding.
- Often data checking also spins out of control into an iterative communication process with the firms' energy manager about missing entries on the form, entries that do not make sense, or sound too optimistic.

The new approach requires most firms to have access to the Internet and a reasonable stable connection.

The salient features of the approach, are described below:

The New Concept: The whole concept of electronic data forwarding by a firm to a server depends on several factors such as:

- The firm has assigned an energy manager who is responsible for data collection, preparation and input into the form
- Trained energy managers and awareness building among company decision makers
- A complex check for logical errors, plausibility, omissions and incompleteness that is periodically expanded and optimized is necessary before submitting data to the databank
- Submitted data would be electronically evaluated and analyzed

- The user will receive an instant feedback in form of a graphical presentation of the analysis of his data, and the firm's performance data as compared to other national and international firms.
- There will be a combination of electronic and human response that identifies solutions to significant deviations from the norm indicating a problem
- The web page must provide additional services allowing an energy manager of a firm to look at the data provided in different forms and ways

A functions on-site data collection system, encoding and submission to the BEE, analysis and comparison by BEE, feedback by BEE to firm, decision to improve performance, verification of the impact through data acquisition again, with subsequent reporting, will close the desired and envisioned improvement cycle.

These are further elaborated as follows:

Energy Manager

The Energy Conservation Bill requires a firm to designate or appoint a certified energy manager and offer training in future tasks. Furthermore, it will be mandatory for designated consumers, such as large cement units, to submit their performance data periodically. As a first step, it will be necessary to:

- Adapt and develop specific reporting forms for the cement industry
- Pilot test and discuss these forms with representatives and consultants of the cement industry with respect to user friendliness and handling
- Prepare forms in an Internet format and link it to a databank
- Field test the forms under real conditions with selected members of the cement industry

Indo German Energy Efficiency Project (IGEEP)

The IGEEP is a technical cooperation between the Indian and German governments since 1995 to assist industry in energy conservation. The project is now in its second phase. The major objective of the project is to promote investments in economically attractive energy conservation measures. In doing this, the project focuses on three areas of cooperation:

- a) Promotion of Performance Contracts in cases where an industrial is not convinced about the cost/benefit of energy conservation, or the perceived risk in actual energy savings is high.
- b) Activities to improve market share of technologies, processes and software for effective monitoring of specific energy consumption and other related and relevant indicators.
- c) Improving the skills of energy managers in technical and economic assessment, as well as internal promotion and verification of energy conservation measures in industry and commerce.

With reference to areas B and C, the project will, in cooperation with the Energy Management Centre (EMC), support those parts of the upcoming Energy Conservation Bill as introduced in the Indian Parliament, that assist designated industries in their efforts to improve energy efficiency.

Identifying Errors and Omissions

There are ample chances of making mistakes while filling out the forms. In general, a large number of errors can be anticipated and checked through simple routines. These routines address different levels and types of errors, which can be typographical, format and boundary related, logical plausibility those violating basic laws of engineering/thermodynamics, or physics.

In general, each form will be checked by a set of 50-150 routines before the data is considered valid.

Data Processing and Analysis

Once data integrity has been invoked, the submitted data is stored in the users' folder to be available for further processing and development of key indicators and graphics.

Electronic Feedback System

One key element of a user-friendly system is the response it gives to the firm. A high quality and comprehensive feedback to the data provider will certainly increase his willingness to provide accurate and complete data. Data processing will be done at four levels:

- Calculation of relevant performance indicators of the firm
- Comparison with historical data of the firm
- Comparison with other firms being in the same business
- Generating electronic, recommendations

In particular, the level of automated electronic recommendations should be considered experimental. Automated electronic answers will require very detailed information concerning the technology and processes used in a firm.

The project in close interaction with experts and representatives of the association would decide which disaggregated performance parameters are of interest to a firm, which of importance to the association, and which allow a fair comparison among firms.

Identifying Solutions

In general, one could label a firm with respect to its energy efficiency to manufacture a certain product only if the process of manufacturing as well as quality and quantity of resource input streams are known. Consequently, each firm's performance could be shown on a horizontal bar relative to the worst and best performer in the database on the similar category of units. However, in practice it is more complicated to arrive at a precise comparison due to the amount of information required. Nevertheless, as a starting point, firms manufacturing the same product and matching other parameters such as processes, capacity of the unit, year of setting up the line, may be rated and compared.

Conclusion

With several achievements to its credit, the cement industry appears to be a good candidate to innovate the information system utilizing IT tools. A professional approach to evolving innovations and sustaining a suitable model catering to the needs of the industry would require close networking within the industry, research institutions, experienced professionals and software application firms.

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