

**Name** : **Ramchandra V Nesari**  
**Designation** : Dy. General Manager (Chemicals)  
**Company name** : Rashtriya Chemicals & Fertilizers Ltd.  
**Complete postal address** : 29A, Technical Building,  
RCF, Trombay Unit,  
Chembur, MUMBAI- 400074  
**Fax no** : 022-25522235  
**Email ID** : [nesarirv@vsnl.net](mailto:nesarirv@vsnl.net), [rvnesari@rcfltd.com](mailto:rvnesari@rcfltd.com)



**Query: What would be the best way to report financial data for the firm in an energy audit report, taking into consideration standard reporting formats already in use where power and fuel consumption is occasionally mentioned.**

**Introduction:**

To achieve the primary objective to reduce energy intensity in Indian Economy, the BEE has undertaken the noble mission to institutionalize energy efficiency services, enable delivery mechanisms and provide leadership towards energy efficiency in all sectors of economy. Under Clause (l) Section 14 of Chapter V, the Central Government by notification, in consultation with the BEE, may direct any designated consumer to designate or appoint energy manager in charge of activities for efficient use of energy and its conservation and submit a report, in the form and manner as prescribed, on the status of energy consumption at the end of the every financial year to designated agency.

The BEE has made available to designated consumers the proforma for submitting energy audit reports annually and all designated consumers have to submit them duly filled annually.. The proforma includes the following financial data required to be submitted for last three financial years:

1. Annual sales turnover of the unit (Rs. Lakhs)
2. Total Energy cost (Rs. Lakhs /year) which consists of :
  - Total cost of electricity consumption (purchased + own generated in the unit) (Rs. Lakhs/ year), which is arrived at by taking into account
    - Total cost of purchased electricity
    - Total cost of own generated electricity (through DG sets, steam and / or GT and taking credit for electricity supplied to grid/ other consumers
  - Cost of fuel consumption (coal and other solid fuels, furnace oil, diesel oil and other liquid fuels, natural gas and other gases including fuels such as gas/ liquid effluent/solid waste generated as by-product/waste) used in process heating.

3. Annual energy savings achieved due to energy efficiency improvement projects/ measures including R & D efforts, technology innovations, energy substitutions and renewable energy systems commissioned during last three years and the investment incurred on the above mentioned items.
4. Investment planned for future measures of energy savings and expected savings thereof.
5. In the summary sheet, total investment made in energy saving measures, actual savings achieved, total energy cost incurred during the reference year are required and thereby % savings achieved ( savings/ energy cost) are calculated.

The above financial data is the basic data required by BEE from designated energy intensive industries. However, to get further insight to the functioning of a unit with respect to energy conservation activities as desired by Government/ BEE, some yardsticks need to be developed to assess the performance and efforts put in by the unit. As for any organizations financial performance is judged by profit earned, which is given in the Annual reports of the organization or published quarterly/ half yearly. But financial markets judge the performance and health of an organization by other information derived from the published information such as- Liquidity ratio, debt equity ratio, profitability ratios ( Profit before tax to capital employed/ net worth/ sales, profit after tax to equity, earning per share (EPS), % increase in net profit as compared to corresponding period (last financial year, corresponding quarter of the last year etc.)

## **2. Ideas on Inclusion of Financial Data**

The yardsticks to be included in the Annual Energy Audit Reports have to be relevant, simple, to be understood easily by all (all designated consumers and monitoring state/ Government agencies or even shareholders). Some ideas regarding development of yardsticks on the following basis are:

- 1) Cost of energy vis-a vis cost of production/ variable cost/ sales
- 2) Investment in energy saving projects.
- 3) Profit generation due to energy saving projects.

### **a) Cost of Energy**

- The performance of a unit/ organization with respect to energy conservation measures has to be evaluated on the basis of controllable items. The most important items that can be controlled in a manufacturing unit is the consumption of inputs and their cost. In the market driven competitive economy the sales realization is not always possible to control. When the level of energy cost incurred by a unit can be represented as a fraction or percentage of sales, it is likely to result into obscure information of the unit with respect to energy conservation efforts. Assume that the energy consumption and its cost (say “X”) remains at constant level for two consecutive years. However, in the year “1” sales realization are say “Y” and next year in year “2”, sales realization increase by 10% to “1.1xY”. Therefore, if the energy cost is calculated a fraction of sales for the two years, following fractions will result:

	<b>Year 1</b>	<b>Year 2</b>
Energy cost, Rs	X	X
Sales realization, Rs	Y	1.10 x Y
Fraction (Energy cost/sales)	X/Y	X/ (1.1 x Y)

Obviously the fraction in Year 1 will be more than that in the Year 2. This is achieved without doing anything for reducing energy consumption or cost. Therefore it may not be prudent to include the sales realization as the basis of for calculating fractional energy cost.

- Next, the basis can be as a fraction/ % of the total cost of production or a fraction / % of variable cost.

When the production levels of the referred year are more or less at the same level, it is possible to compare the fractional energy cost as compared to the cost of production. However, if the difference in production levels are significantly different, fractional energy cost as compared to production cost may indicate wrong picture. Energy costs are in the most of the cases considered variable costs i.e. cost vary directly in proportion to the level of production. Whereas, the fixed costs remain at almost same level irrespective of the level of production. Therefore, when production levels are low, the energy cost as a fraction of the total cost production may be less as compared to the fractional energy cost at higher level of production. Let us take the same example of a surface coating manufacturing firm as given in the write-up of the present Issue. It is assumed that the financial figures given are for 100% production level and corresponding financial figures are derived for say 70% level of production achieved by the unit.

	(Figs. in Rs. Lakhs)	
	<b>100%</b>	<b>70%</b>
<b><u>Variable costs (V)</u></b>		
raw material consumption	7806	5864
Power and fuel	1591	1114
	-----	-----
Sub total (V)	9397	6978
<b><u>Fixed costs (F)</u></b>		
Staff cost	836	836
Interest	902	902
Depreciation	922	922
	-----	-----
Sub total (F)	2660	2660

Total cost of production (V+F)	12057	9638
Power and fuel as % of cost of production	<b>13.2</b>	<b>11.6</b>

-----

From the above example it can be seen that at 70% production levels the power and fuel cost as % of total cost of production is less than that at 100%. Therefore, fractional/ % energy cost compared to total cost of production may be misleading. The more transparent criteria, at least in case of energy intensive industries like steel, cement, fertilizer, petroleum etc. would be energy cost as a fraction of the variable cost.

**b) Investment made by a unit in energy conservation:** This criteria can be fixed on the basis of :

- i) **Sales:** in Pharmaceutical industry, a company is judged by its annual investment in R & D as a fraction/ percentage of total annual sales. In case of energy conservation also, investment done as a percentage of total sales may be possible. However, benchmarking may be required to determine the most desirable percentage industry wise.
- ii) **Profit:** Investment done by a unit as percentage of its profit after tax can be considered as a yardstick. However, when a unit is making investments in energy conservation to turn around in spite of incurring loss, the percentage will be negative and therefore meaningless.
- iii) **Cash Generated:** In cash generation, depreciation and change in current assets and liabilities are taken into account. Even after, a unit running in loss, there is likely to be positive cash generation. Therefore, investment in energy conservation as a percentage of total cash generation may be useful yardstick.
- iv) **Capital Investment:** All progressive companies make capital investments every year to improve its bottom line. Some investments are made in new projects and some are made in existing ongoing operations (which are considered as non-project capital expenditure). Investment on energy conservation as a percentage of total capital expenditure may indicate the efforts made by an organization to reduce its energy costs and improve profitability. In such efforts, the organization need not depend on its internal resources for the sake of investment. It can resort to borrowings (which are available easily for energy conservation) if the investment is really promising in terms of future benefits.

**c) Profit Generated by Energy Savings**

Energy savings are aimed at generating additional profit to a unit/ organization. Therefore, the profit generated due to energy conservation measures needs be separately accounted. It will result in more proactive support of the management to energy savings measures. The profit so earned can be compared with following financial parameters to arrive at following yardsticks:

- 1) **Profit Generated (before interest and taxes) due to energy conservation to total capital employed:** The percent profit on account of energy conservation to the total capital employed will give fair idea of the impact of energy savings in generating additional profits to a unit/ organization.
- 2) **Profit generated due to energy conservation to total profit before interest and taxes (PBIT):** This will be in percent of total profit (PBIT). It will give a good idea about the contribution of energy saving measures of an organization in its total profit earnings.
- 3) **Net profit generated due to energy conservation to Net worth:** The net profit will be different than the profit (before interest and taxes). The shareholders will be interested in this information than anyone else. It will be in percent of the Net worth.
- 4) **Net Profit generated due to energy conservation to profit of an organization after taxes:** This again will percent of the net profit. The shareholders would be more interested in this item.

Any financial data/ yardsticks designed cannot be viewed in isolation to assess the performance of a unit/ organization with respect to its efforts and results in energy conservation. Benchmarking of the technology used has to be taken into account to compare the performance to national and international norms of energy consumption in the industry. Older the technology, there may be more opportunities for energy conservation by making investments in revamping or modifying the processes. It may be appropriate to consider the benefits of energy conservation for three years from implementation instead of only in first year.