

INVESTMENT DECISION BASES FOR ENERGY
RELATED CAPITAL EXPENDITURES

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PREVIEW

INVESTMENT DECISION BASES FOR ENERGY
RELATED CAPITAL EXPENDITURES

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INTRODUCTION

Capital expenditures which involve energy consumption have been made more complex in the past few years due to a number of reasons. One of the main reasons is the increased cost of energy and the uncertainty involved in the future cost of energy. The problem is compounded by the fact that there are different sources of energy available to an industrial customer. In addition, there are clear indications that governmental regulatory agencies may dictate which sources of energy may be used by a particular industrial customer. The plant operator also faces a greater problem today of obsolescent equipment due to escalating energy prices.

Thus, before a final investment decision can be made by an operating plant regarding the energy to be utilized, many factors must be considered. Some of these factors are:

- (A) Types of fuel or energy available, such as natural gas, electricity, coal, and oil.
- (B) Sources of energy and their continued availability over the anticipated life of the project involving the capital expenditure.
- (C) Contractual length of time that a certain fuel or energy is available at a particular price. Thus, an operating plant may have to choose between a long-term fixed price contract for a source of energy which is currently more costly than a short-term contract for an alternate energy source, but which has an

uncertain future regarding available supply and price.

- (D) Operating plants must decide whether to use a single form of energy and then generate alternate forms of energy to be used in the plant or whether to purchase a variety of energy forms which must be transported to the plant site.
- (E) Plant operators have a more difficult problem today of choosing between a project which has low initial capital requirements and a high operating cost due to high fuel requirements versus a project which has a high initial capital requirement and a low operating cost due to low fuel requirements. This choice will now, as in the past, be influenced by the capital currently available to a company, but the company could be paying a bigger penalty today by choosing the project with the lower initial capital requirement if they expect the price of energy to continue to increase in the future.
- (F) Energy utilization options within plants today are more complex due to the higher prices of energy. Thus, an operator must carefully study whether to use the energy he has purchased directly such as using fuel oil to heat up a process stream, or whether to generate an alternate energy with the fuel oil. Another option is to use the fuel oil in a combined cycle where the operator utilizes the energy from the fuel oil directly and also generates alternate forms of energy.
- (G) Finally, the plant operator must make judgements regarding the equipment which is to be installed for a project such as whether

the equipment is likely to become obsolescent due to technological or economic reasons.

The following are some bases which should be used in evaluating the above factors for investment decisions for energy related capital expenditures.

- (A) Always state the problem and alternate courses of action along with their advantages and disadvantages in writing.[1]
- (B) Make sure that the difference between the various alternatives are clearly defined before beginning any definitive calculations.
- (C) The time value of money should be used in economic evaluations. Always use a rate-of-return criterion utilizing compound interest methods for economic comparisons.[2] The payout period method can also be considered, but should be used only in conjunction with a rate-of-return method utilizing compound interest methods. The payout period method can provide additional useful information if a company has a shortage of funds available for plant investment, but the method should never be used as a primary criterion for proposed capital investments.
- (D) Consideration should be given to the differences between the alternatives which cannot be reduced to money values. Security of a proposed energy supply and possible governmental energy policies are two examples of qualitative considerations which should be included in arriving at an investment decision for an energy related capital expenditure.

- (E) Always estimate the future expected cost of a given energy supply. Various prices may be assumed if there is great price uncertainty. A sensitivity analysis should be made to see how the various prices could affect the investment decision.
- (F) The equipment required for a proposed alternative should be evaluated for obsolescence due to expected higher energy costs. Technological evaluations should also be made to determine if a piece of equipment is likely to become obsolete in the near future.

In the past, only a few industries which had very high energy consumption rates seriously studied energy utilization problems. But now with the higher price of energy and limited availability of energy, many more industries are having to study energy utilization practices in their plants, since it has become a larger part of their operating cost. In addition, energy planning has had to be undertaken by most industries since the future availability of a particular energy could affect their entire operation. For example, the tire manufacturing industry is moderately energy intensive, ranking below refineries, chemical industries, basic metals, cement and clay manufacturing processes.[3] On a national scale, the industry spent $\$30 \times 10^6$ for purchased fuel and $\$42 \times 10^6$ for purchased electricity in 1973.[3]

In order for the tire manufacturing industry and other industries to have better decision bases, an energy efficiency index (EEI) has been defined, which takes into account the more important factors which must be considered in making an investment decision for energy