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INDUSTRIAL ENERGY: A PROPOSAL FOR CONGRESS

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We are interested in energy conservation in industry. Thermo Electron is involved in research, development, and manufacture of equipment that uses waste energy to improve the productivity of industrial processes.

Many analyses, including our own, have concluded that the potential fuel saving in manufacturing is larger than that of all the other sectors of the economy combined. By 1985, the saving could be 4.5 million barrels of oil per day, an amount about equal to that consumed by all automobiles today. It can be achieved using known technology to improve efficiency. It would require less capital than that needed to develop equivalent new fuel supplies. It would enhance the economy and create more jobs. It would prevent our energy expeditures from becoming disproportionately high by decreasing our dependence on scarce and high-cost fuels. President Carter has supported these analyses by making conservation and fuel efficiency the cornerstone of his national energy plan.

Despite these benefits and many warnings of energy difficulties ahead, fuel saving is not happening at a rate as fast as the circumstances dictate. For example, though waste energy from industrial processes can be used to generate low-cost electricity, the method has not been widely adopted because manufacturers are not in the energy business and, as President Carter said, "The price industry pays for much of the energy it consumes is not the marginal cost of energy, but rather a 'rolled-in' average cost....."

Again, the Administration and Congress have considered legislative initiatives, such as incentives, guaranteed loans, taxes, or mandatory standards, that would induce or compel industry to move faster in the direction of increased energy efficiency. These initiatives have been frustrated, however, by the complexities of the industrial sector and the lack of a practical efficiency measure that would cover all processes. Understanding and controlling all these processes has always appeared to be impossible because it would have required a huge and wasteful bureaucracy.

Our studies have disclosed that the complexity can be eliminated by considering only three energy-intensive processing functions that are widely used in practically all manufacturing. These are steam raising, heating or drying of products, and electric motors. Collectively, they account for 80 percent of all fuels consumed by industry, an amount greater than that consumed in transportation.

A practical, rigorous, and common yardstick, based on the so-called Second Law of Thermodynamics, can easily be applied to measure the efficiency of each of the three functions. It accounts for both the quantities as well as the qualities of the energies needed and consumed. Its use does not require specialists and a huge bureaucratic structure. Its essential elements can be summarized in a small number of simple tables that fit on less than a page.

Applying the yardstick to the equipment used in each of the three functions in any industry, we find that present practices are only 15 to 25 percent efficient. Using known and cost-effective technology, technology that has lower capital and total costs than those required for new equivalent energy supplies, we find that the efficiency of each of the three functions can be increased to 33 to 40 percent. By 1985, such an increase would reduce our fuel needs by about 3 million barrels of oil per day without affecting our economy and lifestyles, an amount greater than that expected from the enforcement of the automobile efficiency standards. It would require $45 billion less than the capital needed to develop equivalent new fuel supplies.

Because it addresses about 80 percent of energy used in manufacturing, because it is rigorous and practical, and because its key elements are simple, we would like to urge Congress to consider the use of this yardstick as a measure in legislation for industrial energy conservation, as "miles per gallon" have been used in legislation for the automobile industry. Its inclusion in legislation of whatever form could be the single most important energy policy step Congress can take.

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