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Need for Long-Range Energy Policies

Energy has not had much attention lately, but it is a matter that should be under continuing high-level consideration. The National Academy of Engineering has chosen to emphasize the importance of the topic. For the inaugural symposium of the prestigious Arnold and Mabel Beckman Center at Irvine, California, on 11 and 12 May, the title chosen was "An energy agenda for the 1990s." Contents of the talks were largely on uses of the various forms of energy, the pollution problems arising therefrom, the desirability of expanding the role of natural gas, the need to increase efficiency in the application of energy, and the requirement of long-range, steadfast energy policies. Robert Malpas, managing director of the British Petroleum Company, spoke on "A view of global forces in the energy scene." He pointed to the emotions aroused when energy is used to foster material well-being, while at the same time, there are increasing fears about the finiteness of oil, about nuclear power, and about acid rain and the greenhouse effect. Malpas pointed out that there is a clear option that would minimize both the supply and pollution problem, namely, to accelerate the rate of increasing energy efficiency. He pointed out, however, that at present the drop in price for oil makes it difficult for the public to understand that crude oil supplies are finite. Also, low prices do not encourage investment for energy efficiency.

Malpas called attention to unrealistic attitudes of the public which, he said, ". . . concludes that technology will come to their rescue on every issue. They believe that it will continue to stretch out the finiteness of oil, . . . and that it will reduce the energy needed per unit of output, without any action or investment on their part. They also believe that environmental and ecological concerns will be solved by the cavalry—technology—riding over the hill!"

The recent record of the United States in improving energy efficiency is not very good. Between 1974 and 1983, U.S. industry reduced unit energy consumption 20 percent. But at the same time, Japanese industry achieved a reduction in unit energy consumption of 50 percent. Due in part to an expansion of the number of U.S. cars and trucks, consumption of petroleum products here for transportation is setting new all-time records.

The dynamism of some newly industrialized countries will surely lead to much greater utilization of energy by them and greater demands for petroleum in the not distant future. In the competition for oil imports, the people of the United States may find themselves at a disadvantage. Others using advanced technology are willing to work longer hours for lower pay while enduring more pollution. The United States may find it necessary to change patterns of energy usage to lessen dependence on imported oil.

At the Beckman symposium, Chauncey Starr, emeritus president of the Electric Power Research Institute, made an interesting case for an expanded future for electricity. He cited two developments that could ultimately be of great importance—fuel cells and improved batteries making electric automobiles more feasible. Research and development of fuel cells has been meeting with increasing success. Fuel cells can achieve efficiencies of 60 to 80 percent. A phosphoric acid fuel cell employs an input of hydrogen and air. The hydrogen can be obtained from hydrocarbons or by gasification of coal. Improvements in the lead-acid battery and of electric vehicles has made the combination marginally competitive for short-range urban uses. Also improvements in the nickel-iron cell have produced a battery with 50 percent more energy storage per unit weight than the lead-acid cell. Starr stated that a successful 100-mile-range electric automobile could satisfy 92 to 95 percent of the average family's trips and could provide 66 to 74 percent of the annual miles traveled, reducing national oil needs by as much as half and reducing urban pollution.

The overwhelming odds are that the United States will eventually be forced to make the transition to an energy economy based on its own natural resources and employing more highly efficient use of energy. Either the transition will be conducted in a gradual, orderly manner, or it will be conducted in a long drawn-out painful way after a major crisis. Technology cannot come riding over the hill to produce a sudden solution.

—PHILIP H. ABELSON