AAAS on Energy: Toward a Consensus of Urgency

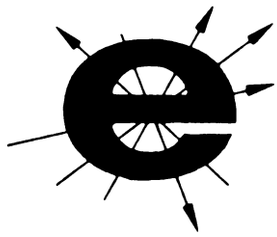
A new sense of accommodation and urgency in the energy debate was evident at the annual meeting of the American Association for the Advancement of Science held in San Francisco this week. A roundtable discussion titled "Energy in the 80s" that had been scheduled for a small parlor had to be moved quickly to the San Francisco Hilton's largest ballroom, which was soon filled to capacity. There the audience heard old antagonists reach a new consensus on the need for immediate action and the impending danger of war over oil.

The threat of war will most likely arise if some Middle Eastern crisis results in a severe, worldwide shortage of oil, said John O'Leary, former deputy secretary of the Department of Energy. Until now, despite rapidly escalating prices, there has been a "chronic world oil surplus," he said. The latest indication of this surplus came when a cutoff of Iranian oil was quickly offset by increased production in other OPEC nations. But the 1980s will almost certainly see the elimination of excess capacity, O'Leary said, and a "cross-over" into permanent shortages. In that atmosphere, any further drop precipitated by political crisis could well spark military intervention by the great powers.

Harvard University's Daniel Yergin, who entitled his talk "The Vindication of Chicken Little," told the audience that "energy has already brought on an economic emergency of the first order." While agreeing that interruption of oil supplies could be the most serious energy problem of the next age — likely leading to war because of the clear threat to vital national interests — Yergin emphasized the present need to shift from arguing about energy to acting quickly on conservation and the development of alternative resources. "The international energy system is collapsing into anarchy," he said; "there is a diminishing of rational management. It is time to get out of Fantasyland."

But differences remain. Biologist Barry Commoner urged a major shift of cropland from soybeans to sugarbeets so that the excess sugar could be used to make alcohol to be mixed with gasoline. Such a switch "could stop those gas lines probably next year or the year after." Since the cost of non-renewable energy resources is bound to rise exponentially, the only solution to the problem, he said, is to move toward renewable sources like solar power as quickly as possible.

Although there was no opposition to the adoption of renewable energy, as such, other speakers on the panel challenged Commoner's timing. Chauncey Starr, vice-chairman of the Electric Power Research Institute, replied that during the next few years only conservation can be implemented quickly enough to make a substantial difference. And over the long run, he said, it will be important to try a variety of technologies in large-scale facilities to see which ones work. The 1980s, Starr says, must be considered as "the first decade of the transition period during which the foundation for future energy technologies is established....It is not only important that the technical and economic feasibility of alternatives be established, but also that the side effects, environmental impacts and social costs be revealed by full-scale demonstration."



Some halting steps toward resolution of the economic and social conflicts surrounding the energy question were evident in other sessions at the AAAS meeting. For a long time many economists viewed energy supply problems as merely "externalities" — entities not easily covered by traditional economic analysis. An important theme running through several papers presented by economists at the AAAS meeting was the necessity of developing new analytical methods for handling such externalities.

Such emphasis comes as at least a partial vindication for Nicholas Georgescu-Roegen of Vanderbilt University, long a voice crying in the wilderness, defying the "price complex" of traditional economists. Some years ago he propounded a principle he referred to as the Fourth Law of Thermodynamics: "A closed system cannot perform work indefinitely at a constant rate." Since the quality of matter, as well as energy, tends to deteriorate with time, consideration of diminishing resources themselves is needed in any economic calculation about the system. Price alone will not suffice.

Having derived a complex mathematical analysis system based on this principle, Georgescu-Roegen has applied it to today's energy problems and concludes that none of the present technologies can yet serve as a viable basis for the world of the future. Current solar technologies, he told this year's AAAS audience, are still "parasites" of the existing system — unable to sustain their own growth and replication into the indefinite future. The breeder reactor would fulfill this viability criterion, he says, but it is beset by uncertain risks and technical snags.

Bruce Hannon of the University of Illinois presented a method for analyzing energy technology in terms of net return on energy investment — "the ratio of present value of net output to present value of all inputs." Although he admits this tool is not sufficient to select the best out of many energy technologies, it does provide a useful way to indicate which ones are slow to give back the energy needed to build and maintain them. For example, in his calculations wind machines show a much faster return on energy investment than do flat plate solar collectors.

Even when such analytical economic methods are well established, the problem of applying their results in a highly politicized atmosphere will remain. And in an exceptionally articulate and detailed paper, Gregory A. Daneke of the University of Michigan Resource and Management Program outlined the problems facing planners as they try to choose appropriate energy technologies for the future. Environmental impact statements, in particular, he says, have become basically defensive documents designed mainly to avoid litigation. They get bogged down in technical detail and fail to identify critical policy issues.

To make effective choices, he says, requires development of "integrated assessment." This would include not only environmental impact assessment and economic analysis, but also determination of the effect of some new technology on society and the quality of life. And in using these assessments, public agencies like the Department of Energy must shift from their present defensive posture toward one more congenial to flexibility and learning. And adequate public involvement and better interaction with the business community will be needed for success, he says.

For planners to exercise their prerogatives based on these "integrated assessments," however, will first require a toning down of the present virulent energy debate. In interviews with SCIENCE NEWS, several scientists indicated that they see a consensus developing not only on the urgency of the present situation but on a course of action, as well. "We need to get people away from each other's throats," says Milton Russell of Resources for the Future. Then they may discover that "each can save the core of his beliefs" while working together in the decision-making process. "It's a slow and messy process to come to a consensus on divisive issues in this society," he says, but one does finally seem to be developing. □