A key event in the improvement of prospects for science and technology seems to have been the Community summit meeting in Paris in October 1972. Out of this meeting came instructions to the commission to give a higher priority to science and technology and to come up with specific plans for doing so.

Within a few months, Euratom had been given its first "pluriannual" budget in 5 years and put on notice that it was in for a major reorganization. Some observers attribute this development in part to the arrival in Brussels of France's François- X. Ortoli to take over as president of the commission at a time when his country wished to be constructive and amenable and to counter the reputation for negativism in the field of community scientific af-

Academy Says Energy Self-Sufficiency Unlikely

Getting a piece of the action in the national energy debate is becoming almost mandatory for every scientific and technical organization in Washington; even this journal has come out with a special issue devoted to the subject. Now the National Academy of Engineers has weighed in with its contribution, a 140-page report outlining what W. Kenneth Davis of the Bechtel Power Corporation, chairman of the academy's energy task force, describes as a "survival kit" to get the nation through the period from now to 1985.*

The report addresses the problem of eliminating or substantially reducing energy imports in the coming decade. It estimates the effect of conservation measures on energy demand and the extent to which domestic supplies can be expanded, and finds that, just possibly, independence could be achieved by 1985. It proposes programs (in addition to the energy R & D efforts already being set in motion) to accomplish this goal and comments on the proper roles for industry and government. The report's most notable contribution, however, lies not so much in its generally conventional view of how to scale down imports but in its enumeration of the mind-boggling logistics and costs such an effort would entail. Among the problems considered are capital costs, manpower needs, transportation of fuels, and the availability of water, any of which could prove a bottleneck on the road to energy independence.

The academy task force included some prominent spokesmen for the U.S. energy industry, and indeed a majority of the group had industry ties. Conflict of interest charges may be beside the point (the academy forthrightly says that the report relies more on the experience of the panel members than on any new analytical research), but the report is nonetheless open to criticism as reflecting an industry viewpoint of how to achieve energy independence. The report assumes, for example, no direct government involvement in the production of energy or the management of the energy industry. Instead, the task force urges the government to take prompt action to clear away red tape, provide incentives, and solve environmental problems, leaving industry free to get on with the job. In essence, the philosophy espoused is to push the existing energy system harder and to avoid creating any new institutional arrangements in the interests of getting things done quickly. Alternatives, such as wartime-like mobilization of the industry or expanded roles for federal agencies, are not considered.

The United States used the equivalent of 37.2 million barrels of oil per day (MBPD) in 1973. With higher prices and serious conservation efforts, the report finds, total energy use might rise in 1985 to 50 MBPD instead of the 58 MBPD otherwise forecast, The report thus lends credence to the notion that the growth rate in the demand for energy can be held closer to 2 percent annually than to the 4 percent of recent years. To supply this demand, the report proposes twofold expansion in the use of coal, construction of nuclear power plants at more than twice the present rate, and a 25 percent increase in domestic oil and gas production, largely from offshore fields. Synthetic gas from coal could amount to the equivalent of 0.8 MBPD and synthetic liquids (methanol and oil) to 0.6 MBPD in 1985. The report is particularly enthusiastic about coal liquefaction and pessimistic about the prospects for large quantities of oil from shale. Imports of oil would rise in the next few years, but could begin to taper off after 1978.

The scope of what is involved is indicated by the estimates the task force produced. In the next decade, for example, 100 new strip mines would be opened in the western states and 140 (smaller) deep mines in the East. Hundreds of oil rigs capable of drilling in water deeper than 300 feet must be built (there are 11 such rigs in the Gulf Coast now). Between two and three nuclear power plants must be started every month. Nearly 60,000 oil and gas wells must be drilled every year.

Such a vast expansion of domestic energy production would raise a number of subsidiary problems, according to the report:

► Capital costs—$600 billion in direct costs for energy production equipment must be raised; of the total, about half would be for electric power. Financing costs and subsidiary activities would be extra.

► Manpower—30,000 additional engineers, 190,000 more industrial construction workers, 240,000 new equipment operators, and 125,000 additional coal miners will be needed. The report anticipates shortages in many categories unless special efforts are undertaken.

► Water availability—shortages, particularly in the eastern states, may require the development of new underground sources and the transporting of coal to other areas for processing.

► Energy transport—moving massive amounts of coal will require major increases in rail-barge and pipeline capacity, including manufacture of 8,000 new locomotives and 150,000 additional hopper cars.

All in all, the academy report is not optimistic that all the problems can be solved on the time scale it proposes. We may yet have to buy a lot more Arab oil.—ALLEN L. HAMMOND

* *U.S. Energy Prospects, An Engineering Viewpoint* (National Academy of Engineering, Washington, D.C., in press).