

## USA

# Carter's energy problem

*As America freezes energy matters grow more important. Colin Norman reports from Washington on the continuing search for an energy policy*

It didn't take long for President Jimmy Carter to be brought face to face with the energy crisis. Within a week of taking office, he was forced to ask Congress for emergency powers to deal with a critical shortage of natural gas

in parts of the eastern United States—a shortage brought about by an extraordinarily cold winter and several years' lack of a coherent energy policy. Though at this stage Carter can do little more than spread the shortage around, urge people to be less profligate in their use of energy and pray for warmer weather, the new Administration is promising to set things right in the long term with a comprehensive energy policy, a strong conservation plan and an overhaul of the federal

energy bureaucracy.

Clearly, energy matters are going to keep the Administration busy, but at least it will have no shortage of outside advice. In that regard, a mammoth study now being put together by the National Academy of Sciences is likely to prove particularly influential. Due to be completed by June 30, the study is one of the most ambitious projects the Academy has yet undertaken. It involves some 250 people, sitting on a variety of panels and committees, who are now channelling their advice to a steering committee co-chaired by the ubiquitous Harvey Brooks, professor

## Changing of the guard

● As the new Carter Administration settled into its first full week in office, selection of the second-level Presidential appointees began in earnest, but by the end of the week, none of the key science posts had been filled. The most important job, head of the Office of Science and Technology Policy (OSTP) and Science Adviser to the President, was still open following the departure of H. Guyford Stever on January 20. About the only sign of movement is that Carter has asked the Defense Secretary, Harold Brown, to draft a list of potential candidates for the OSTP post, a curious assignment since OSTP has little influence over defence matters, and most other Presidential appointments are being handled by a team in the White House.

As for the major science agencies, Donald Fredrickson, the popular director of the National Institutes of Health (NIH), had not heard by the end of last week whether he will be kept in his job. At a press conference, however, Joseph Califano, the new Secretary of Health Education and Welfare, promised to end the politicisation of NIH, but he said he hadn't made up his mind about Fredrickson's future. Similarly, Robert Seamans Jr, has departed as head of the Energy Research and Development Administration, but no successor has been named. It is widely reported, however that Douglas Costle, a former staff member of the Congressional Budget Office has been chosen as head of the Environmental Protection Agency, to replace the already-departed Russell Train.

About the only major scientific appointment so far is that of Patsy Mink, a former Congresswoman from Hawaii, to be Assistant Secretary of State in charge of science and technology affairs. The post was once held by Dixy Lee Ray, the former

head of the Atomic Energy Commission who is now Governor of Washington State, but she quit with a blast at Henry Kissinger because of his indifference toward her office. The selection of Mink, a lawyer, for a post which many people consider should be held by a scientist, or at least by somebody well versed in scientific matters, will not do much to enhance the status of the office.

● Meanwhile, at the other end of Pennsylvania Avenue, Congress is finally getting itself in gear for the new session. The plan to reorganise the committees of the Senate, which was drafted last year by a special select committee, has now been picked over and amended by the Senate Rules Committee and it is expected to be debated by the full Senate this week. Although several more changes are anticipated, the chief committee alignments for science and technology affairs are likely to remain virtually as proposed by the select committee.

The Joint Committee on Atomic Energy, which has already been cut up by the House, will be completely done away with, and all jurisdiction for energy policy and energy research and development will be placed in an expanded Interior committee, under the chairmanship of Senator Henry Jackson. Responsibility for biomedical research will be consolidated in a new Committee on Human Resources, based on the old Labor and Public Welfare Committee, which means that Senator Edward Kennedy's subcommittee will retain its jurisdiction. The rest of the responsibility for science and technology, including overall science policy affairs, will be placed in an expanded Commerce Committee. Senator Adlai Stevenson, who chaired the select committee, is expected to end up with chairmanship of the key Commerce subcommittee dealing with

science and technology.

The only major change from the select committee's proposals is that jurisdiction over the National Science Foundation (NSF) will go to the Human Resources Committee. On the face of it, a decision to put NSF affairs into a committee which deals with health and welfare rather than into the Commerce Committee, which deals with science, may seem a bit illogical. The reason is that Kennedy, whose NSF subcommittee now handles NSF matters, is a member of the Human Resources Committee but not of the Commerce Committee, and he wants to hang on to his NSF jurisdiction. That's the way Congress works.

On the House side, the Science and Technology Committee, which has picked up responsibility for nuclear research and development from the Joint Committee on Atomic Energy, has been reorganised. Chairmanship of the subcommittee on Science, Research and Development, which deals with NSF, has been assigned to Representative Ray Thornton, a Democrat for Arkansas. Energy matters will be handled by two subcommittees, one of which will deal with fossil energy and nuclear fission and fusion, while the other will deal with solar and geothermal energy, energy conservation and basic energy research. Rep. Walter Flowers, a long-serving member from Alabama, claimed the chairmanship of the fossil and nuclear subcommittee, while Representative Mike McCormack, who was widely expected to get authority over nuclear matters, was left with the solar and geothermal subcommittee. Flowers' views on energy policy are little known, but his new post will give him plenty of visibility, a useful asset if, as expected, he decides to run for the Senate in 1978.

Colin Norman

of technology and public policy at Harvard, and Edward Ginzton, chairman of Varian Associates.

A tantalising preview of some of the conclusions likely to emerge from the study surfaced last week when the steering committee issued an interim report, essentially suggesting that energy use in the United States will grow at a slower pace than most other studies have anticipated. The committee suggests, moreover, that the country can adjust to a slower rate of energy growth without sacrificing economic or social goals.

If the Academy does indeed come up with such a conclusion, it would add considerable weight to the view put forward a couple of years ago by the Ford Foundation's Energy Policy Project, namely that energy growth can be gradually reduced over a decade or so to a very low rate, without either causing economic stagnation or radically altering people's lifestyles. The practical consequence of such a development—if true—would be that there may be much more flexibility in long term energy supplies than is generally realised; Mr Carter could, for example, carry out his campaign pledge to slow down the present breakneck pace of the breeder reactor programme, without running a large risk of causing massive economic disruptions toward the end of the century.

Further evidence of the growing acceptance of the view that energy growth is likely to slow markedly is

also to be found in a meticulous study of the possible consequences of a nuclear moratorium, produced recently by the Institute for Energy Analysis (IEA), headed by Alvin Weinberg. The study predicts that total energy use in the year 2010 will lie between a low of about 118 quads and a high of about 159 quads, compared with 71 quads in 1975. It notes that "even our 'high' estimate . . . is much lower than most previously published estimates. If our estimates are valid, they could imply considerable rethinking of those elements of energy policy and energy R&D policy that are premised on higher overall projections."

Because of those lowered energy growth rates, the study estimates that the economic and environmental impacts of a nuclear moratorium (which would prohibit the construction of new reactors after 1980 but allow continued operation of reactors on line by 1985), though severe, would be smaller than is generally believed. It is assumed that most of the energy shortfall would be taken up by a switch to coal in the short term, with growing input from alternative sources such as solar energy, which would tend to increase the cost of energy by a total of between \$31,400 and \$42,000 million by the year 2010, the study estimates. That would amount to less than 1% of the gross national product each year. As for employment, the study predicts that a moratorium would result in the loss of about 50,000 jobs in the nuclear and

related industries, but "the displacement caused by the moratorium would be temporary".

The environmental implications of a switch from nuclear to coal could be relatively severe. If the moratorium is coupled with limitations on oil imports, which would be likely, between 100 and 300 million more tons of coal would have to be mined each year in the period between 2000 and 2010 than would be the case without a moratorium. That would probably despoil larger areas of land for strip mines, increase atmospheric levels of carbon dioxide, and possibly increase pollution from sulphur dioxide, oxides of nitrogen, hydrocarbons, particulates and carbon monoxide. Increased use of pollution control technologies would, however, take care of some of the increases.

Though such impacts are relatively large, they certainly do not add up to the level of economic and social disruption predicted by the nuclear industry last year during the referendum in seven states on nuclear power.

The expectation that energy growth in the United States will slow down over the long term without precipitating economic stagnation, which drew sharp criticism when the Ford Foundation published its study, is therefore growing in acceptance. It means that President Carter may have more flexibility when he chooses his long range energy plans, but it won't help much over the next few years. Only some warmer weather would do that. □

## AUSTRALIA

# SCORE scores

*Peter Pockley reports from Sydney on Australia's data collecting project for research expenditure*

INACTIVITY on questions of priority and level of financial support for science in Australia has regularly been justified on grounds of a lack of reliable data on expenditure and manpower. In the early 1970s, the then Department of Education and Science started the first national data collecting operation and graced it with the acronym of Project SCORE (Survey and Comparison of Research Expenditures).

The project, however, was for some years plagued by problems of definition, management and staffing. But it did manage to grind out in 1973 a detailed set of figures for the financial year 1968–69 (the Australian financial year runs from July 1 to June 30, with the exception of the universities whose accounts run from January 1 to December 31—just one of the problems faced

by the number crunchers). These figures came out just as inflation began to canter up towards the gallop of 1975 and 1976, and this, coupled with the long delay between year of study and year of publication, greatly diminished their value.

The Department of Science has now begun publishing the second set of Project SCORE data. These refer to the financial year 1973–74; being more recent, the project scores more useful points for the student and politician of science alike. However, the criteria used in collecting and processing the data are not entirely consistent with the 1968–69 figures because the project changed to following OECD prescriptions very closely. This makes international comparisons valid, but has negated any reliable and precise statements on national trends in expenditure and manpower which are so urgently needed for drumming complacency out of politicians. This will have to await the next publication planned for the financial year of 1975–76 (the Depart-

ment now hopes to collect data at two-yearly intervals).

Project SCORE reveals that in 1973–74 the Gross Expenditure on Research and Development (GERD) amounted to 651 million Australian dollars (£1=\$1.58). This represents 1.3% of the Gross Domestic Product (GDP) of \$50,557 million for the year under study. The manpower involved in GERD was equivalent to 53,300 man-years, representing 0.9% of the Australian work-force of 5,867,700; 48% of the manpower effort was attributed to professional persons. There are, however, no figures for the supply and demand of professionals, nor are these available from other sources to confirm or deny the now popular belief in Australia of an oversupply of scientists and technologists at a time when overall unemployment is nudging 5% of the workforce.

Using OECD's definitions, 91% of GERD was spent in the natural sciences, and 9% in the social sciences and humanities, assuming all business enterprise expenditure to be in the former. Basic research took 28% (\$184 million) of GERD, applied research