substance that deteriorates before reaching the upper atmosphere. Small quantities of 134a were manufactured by Du Pont in 1979 and samples were supplied to a few equipment manufacturers for testing in refrigerators and automobile compressors. The availability of a substitute for automobile air conditioning systems is particularly significant because large amounts of CFC emissions result from these leaky systems.

Paul Halter, business director of Du Pont's Freon division, says that tests show that 134a is a direct substitute in some refrigeration and air conditioning systems. The chemistry of lubricants mixed with CFC's used in compressors must be reformulated, but Halter says this is a minor problem. The chemical also may have applications for foam product producers. Du Pont is not the only company in a position to make this substance, other American, Japanese, and European producers also are capable of manufacturing it, analysts say.

While shifting away from CFC use in aerosols in Europe and elsewhere, or creating replacements for currently used compounds will be relatively easy in some instances, options may be limited in other cases. The electronics industry, for example, relies heavily on CFC 113 to clean circuit boards after components have been soldered. There appear to be few other solvents that can meet the industry's performance standards and that are relatively nontoxic.

Toxicity of substitutes, says Kathleen Wolf of Rand, is often overlooked in the debate about shifting away from CFC's. Though changes may be necessary, she says, the alternatives may carry a higher risk. Companies that now use CFC 11 to produce foam cushions, for example, will turn to methylene chloride, which is more toxic to workers.

Despite these problems and opposition from segments of industry in the United States and abroad, some EPA and State Department officials say a scheduled CFC ban may be the easiest way to reach an international agreement. EPA analyses reveal that a strategy based on just controlling emission levels of traditional CFC compounds could impose steep cutbacks and force Western countries to develop CFC substitutes anyway. To accommodate economic growth, the Eastern bloc and developing nations are expected to demand rights to use additional amounts of CFC beyond current levels.

Under a Canadian proposal that would allocate CFC rights on the basis of gross national product and population, the U.S.'s use of CFC 11 and CFC 12 would have been cut 32% in 1984; actual usage was 238,100 metric tons. Similarly, the European Community would have had to reduce consumption 37% to 138,400 metric tons. In contrast, the Eastern bloc would gain rights to nearly double its use of these CFC compounds from an estimated 1984 level of 60,000 metric tons.

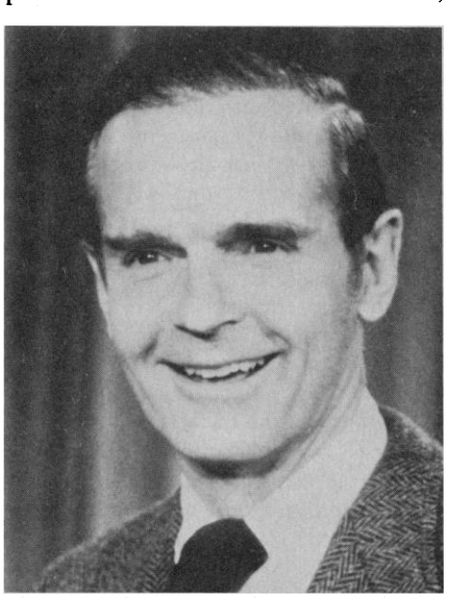
This level of disruption, however, may not be enough to get other industrial nations to back the United States plan to phase out CFC's over time. The alternatives—a freeze or rollback—appear increasingly messy. NRDC's Doniger notes that it does not provide industry with any long-term certainty on which to base investments in substitute technologies. Subsequent scientific findings may result in use of CFC's being eliminated anyway. With countries free to consume their CFC allocation any way they wish, Commerce Department officials note, problems may arise in the trade of products made with or containing CFC's.

Further clouding the issue with respect to American industry is whether the EPA will issue rules that are more stringent than what the international community adopts. The agency is compelled by a federal court order to make a final decision by November 1987 on whether and/or to what extent CFC's should be regulated. Lone action by the United States would not be effective in tackling the perceived global problem. Just what sort of gamble the world is willing to accept on the ozone layer may become clear by April when participants to the Vienna convention are supposed to arrive at a plan. ■ MARK CRAWFORD

Changing of the Senate Guard

The return of the Senate to Democratic control, following 6 years of Republican rule, will put some new people—as well as several old hands—in key science policy posts. Although the committee chairmanships will not be decided finally until Senate Democrats caucus in late November, most, if not all, are likely to be allotted strictly according to seniority. Subcommittee chairmanships will not be finalized perhaps until January.

In line to become chairman of the powerful Senate Appropriations Committee is John Stennis (D–MS), who headed the Armed Services Committee in the Senate's previous Democratic incarnation. Stennis, 85, succeeds Mark Hatfield (R–OR).



William Proxmire. *In line to chair appropriations subcommittee that handles NIH budget.*

William Proxmire (D–WI) is expected to get the chairmanship of one of two key appropriations subcommittees that handle the budgets of science agencies. He is in line to chair the subcommittee on labor, health and human services, and education, which oversees the budgets for the National Institutes of Health and other health agencies. But he could instead claim the chairmanship of the subcommittee on housing and urban development and independent agencies, which handles the budgets of the National Aeronautics and Space Administration and the National Science Foundation. If Proxmire decides to stay with the health subcommittee, Patrick Leahy (D–VT) would be the most likely chairman of the housing subcommittee. In line to chair the subcommittee on energy and water development, which oversees the Department of Energy's budget, is Bennett Johnston (D–LA).

The chairmanship of the Committee on Commerce, Science, and Transportation is expected to go to Ernest Hollings (D–SC), who will succeed John Danforth (R–MO). The most senior Democrat currently on the subcommittee on science, technology, and space is Donald Riegle (D–MI).

The new chairman of the Committee on Labor and Human Resources, which oversees NIH, will be Edward Kennedy (D–MA), who chaired the committee before the Republicans took control of the Senate. Kennedy, who was also in line to chair the Judiciary Committee, has decided to head the labor committee because it provides a better forum to challenge the Reagan Administration's domestic priorities. ■

COLIN NORMAN