

EARLIER HARM SEEN IN GLOBAL WARMING

Severe Damage in First Years of Next Century Forecast by Study for the U.N.

By WILLIAM K. STEVENS

After two years of study, an international group of scientists working under United Nations auspices has found that global warming could cause serious environmental damage starting in the early years of the next century, long before the maximum temperature levels predicted by many scientists are reached.

And for the first time, they recommended establishing limits beyond which the average global temperature and sea level should not be permitted to rise, lest the world be subjected to serious and ever-increasing risks.

These limits are well below the levels that another international scientific panel said last June will ultimately result if heat-trapping gases, mainly carbon dioxide, continue to pour into the atmosphere at the present rate.

A report issued yesterday also includes a detailed analysis of measures that might bring the expected warming under control and concludes that if the measures are aggressively pursued, the limits can be achieved.

Steps Toward Formal Treaty

The conclusions, recommendations and supporting analyses will furnish grist for the Second World Climate Conference starting in Geneva on Oct. 29, a gathering sponsored by the United Nations at which governments from around the world expect to take the first steps toward what they hope will be a formal treaty aimed at controlling global warming.

Two international groups of scientists have been studying the problem, both with United Nations sponsorship. One, operating as part of the Intergovernmental Panel on Climate Change, was formed in late 1988 to advise the governments attending the World Climate Conference. The other, which was formed in 1986 and was the progenitor of the intergovernmental panel, has no government affiliation but rather is an association of independent scientists called the Advisory Group on Greenhouse Gases.

The independent group's report, issued yesterday in London, Stockholm and New York, goes beyond the scientific assessment of the intergovernmental panel, made public last June, in attempting to set targets for the control of global warming.

Among the practical measures that the scientists said might be taken to limit the warming were improved energy efficiency, greater reliance on natural gas, reforestation and the adoption of alternative energy sources that are both technologically and economically feasible. The sources include solar, wind, geothermal and biomass technologies. "Limiting emissions so we can stay below the minimums should be attainable," said Michael Oppenheimer, senior scientist for the Environmental Defense Fund, who was the chairman of the working group on control measures.

Rate of Increase Forecast

In June, the scientists advising the intergovernmental group predicted that under what it called the "business as usual" scenario, the average global temperature would rise by nearly two degrees Fahrenheit by the year 2025 and by more than five degrees by the end of the next century. The rate of increase, which scientists say is as important as the absolute increase because of the difficulty of adjusting to rapid climatic change, was predicted at about half a degree per decade.

In the report issued yesterday, the independent scientists said that to minimize the risk of environmental damage, the rate of increase should be held below one-fifth of a degree per decade.

An absolute increase beyond 1990 of more than about two degrees above pre-industrial levels, it said, "may elicit rapid, unpredictable and non-linear responses that could lead to extensive ecosystem damage." Non-linear responses refer, for example, to sudden jumps in global temperature rather than even, gradual increases.

The report last June of the intergovernmental scientific panel said that the world has already warmed by about half a degree to one degree since the industrial age began, but scientists do not know whether this rise was caused by greenhouse gases emitted as a result of human activity or whether it is attributable to natural climatic variability and therefore, possibly, is temporary.

'Severe Impacts' Without Action

The report said that the atmosphere may already contain enough heat-trapping gases to push the global temperature above the two-degree target. "This means that unless we take very prompt and significant actions to reduce greenhouse emissions, we're very likely to experience severe impacts," said Peter Gleick, a co-chairman of the working group dealing with targets. He directs the global environmental programs of the Pacific Institute in Berkeley, Calif., a non-profit research institute.

The report established an "upper limit" of about 3.5 degrees in temperature increase since the start of the industrial age "beyond which the risks of grave damage to ecosystems, and of non-linear responses, are expected to increase rapidly."

While the voluminous study was reviewed in detail by other scientists before it was issued, not all authorities were initially prepared to give it unqualified endorsement.

"It sounds as if they've taken the worst-case scenarios and tried to make the case for a maximum effort," said William D. Nordhaus, a Yale University economist who cautioned that he had not yet had a chance to read the report. He has been the chairman or co-chairman of a number of National Academy of Sciences panels looking into global warming.