

Tough carbon budget could slow warming

If the impending warming of Earth's climate — fostered largely by the release of "greenhouse" gases — grows too large or occurs too rapidly, many ecosystems may not adapt well enough to survive. To protect them, industrialized nations should halve their carbon dioxide releases from fossil-fuel combustion within 25 years and reduce those emissions to 75 percent below current levels by 2030, according to a new study commissioned by the Dutch government. However, the wealthiest and most fossil-fuel-intensive economies — including the United States — should reduce emissions even faster to allow for slower progress in eastern Europe, the study's authors say.

The Dutch government authorized public release of the report, entitled "Energy Policy in the Greenhouse," at the 70-nation Ministerial Conference on Atmospheric Pollution and Climate Change last month in Noordwijk, the Netherlands. In the United States, the report was formally unveiled last week at a briefing for members of Congress and their staffs.

Designed to identify benchmark limits on greenhouse-gas emissions, for use in drafting an international convention to limit climate change, the study began with an investigation of the warming rates most ecosystems might reasonably be expected to handle, says Florentin Krause of the Lawrence Berkeley (Calif.) Laboratory, who directed the effort. His team then calculated limits on greenhouse-gas releases that would likely hold warming within these limits.

The ecological risk assessment suggested warming should not exceed more than 0.1°C (about 0.2°F) per decade. Though this may not seem large, Krause notes that it's 10 to 20 times greater than the rate of change that typifies transitions from ice ages to warmer periods. He says it's also what "the best current data" suggest woodland ecosystems can withstand without risking a catastrophic dieback of mature trees.

While Krause acknowledges there's no way to predict with certainty how Earth's interdependent ecosystems will respond to a changing climate, he points out that the warmer the overall climate becomes, the less likely it is that many ecosystems will adapt.

So in this study, researchers set the limit on absolute warming at 2.5°C above temperatures typical of the mid-19th century, just prior to the industrial revolution. Records indicate the average global surface temperature has already climbed about 0.5°C since the 1850s. In their report, the authors point out that the last time Earth's climate averaged 2°C warmer than preindustrial times was about 125,000 years ago — a period when

humans, as hunter-gatherers, did not depend on cultivated agriculture. They add that Earth has not been 2.5°C warmer in 2 million years — since before the emergence of humans or, indeed, about 70 percent of today's species.

On the basis of these constraints, the authors calculated an upper limit on allowable cumulative carbon dioxide releases between now and 2100. The best evidence suggests the world must live within a carbon budget of roughly 300 billion tons, or 50 years' worth of emissions at current rates, they report. The study's per-decade limit on warming also suggests humans must ultimately reduce their annual global carbon dioxide releases to about 25 percent of what's emitted today.

Krause cautions that the tough limits on carbon dioxide emissions — which today account for almost 60 percent of the annual human contribution of greenhouse gases — do not reduce the need to limit other greenhouse gases. In calculating carbon budgets, the researchers assumed a total phaseout of chlorofluorocarbon emissions by 2000, a replanting of forest cover to maintain levels typical of the mid-1980s, a limit on methane releases and a slowing in the buildup of atmospheric nitrous oxide concentrations.

Allocating the carbon budget between industrialized and developing countries must rely on diplomatic negotiation, according to the report. But Krause's team expects to offer some guidance in a companion report due out next year. That study will detail technological and economic options already available for reducing carbon dioxide emissions — such as imposing a "carbon tax" on fossil-fuel use or installing "scrubbers" to remove the pollutant from powerplant stack gases. Though the necessary reductions won't be easy, Krause says his analyses also suggest that a dramatic phasedown in carbon dioxide releases need not require crash programs or sacrifices in economic competitiveness — provided reduction measures begin immediately.

"I approve of what they're trying to do, and fundamentally, their approach is right," comments Stephen H. Schneider, a climatologist and global-change analyst with the National Center for Atmospheric Research in Boulder, Colo. But regardless of how well researchers try to ground such analyses in biology or atmospheric chemistry, there will remain sufficient scientific uncertainties to leave skeptics room for quibbling, he says.

Stewart Boyle of the Association for the Conservation of Energy in London, England, is more optimistic. The new report "is a blueprint for a future international agreement on carbon," he says, and "will help shape the [climate change] debate." Just last week, Boyle notes, Krause briefed high-ranking government officials in France and environmental leaders in the British parliament. — *J. Raloff*

Turning up the dirt in cholesterol screens

Shoppers who take a cholesterol test at the mall may not get what they bargained for. Many public cholesterol screenings are inaccurate, unsanitary and improperly conducted, according to a report released this week by Richard P. Kusserow, inspector general of the Department of Health and Human Services.

"Much of public cholesterol screening is tainted by staggering sloppiness, frequent indifference to infection control, and widespread use of untrained personnel employing improperly maintained or poorly calibrated equipment," says Rep. Ron Wyden (D-Ore.), who chairs the House Small Business Subcommittee on Regulation and Business Opportunities. Wyden's subcommittee is examining the safety and reliability of medical testing.

Kusserow's office gathered information on public cholesterol screening from all 50 states and the District of Columbia, and sent staffers to be tested at 71 such screenings. The staffers reported that public screeners often ignored operating recommendations from the National Cholesterol Education Program (NCEP). For instance, more than half the staffers said testers squeezed their pricked fingers rather than letting the blood flow out freely. "Milking" the finger can break down red blood cells or introduce extraneous material, yielding artificially low results, Kusserow notes.

Most staffers whose cholesterol readings surpassed 200 — the borderline-high range — weren't told to see a physician, despite NCEP's recommendation that they should. Eight sites were dirty. A third of the testers didn't wear gloves when taking blood, even though many of these also handled money. Of those who wore gloves, only about half changed them between tests. And at more than half the sites, workers did not dispose of used lancets and needles in a container marked for biohazardous wastes.

"Given today's concern for the spread of AIDS and hepatitis, these findings are particularly disturbing," Kusserow says.

Wyden says a 1988 law requires cholesterol screeners to register with their states by 1991 and obtain licenses. Today, only 16 states regulate public cholesterol screening, Kusserow says.

In a statement released this week, the American Heart Association expressed concern about mass cholesterol screenings "that are not part of the medical care system." They may have limited value, according to the statement, because most people they reach are at low risk or already know their cholesterol levels. The association recommends a shift to smaller-scale screens conducted by health professionals at workplaces, schools and churches. — *D.E. Loupe*