

CLIMATE CHANGE

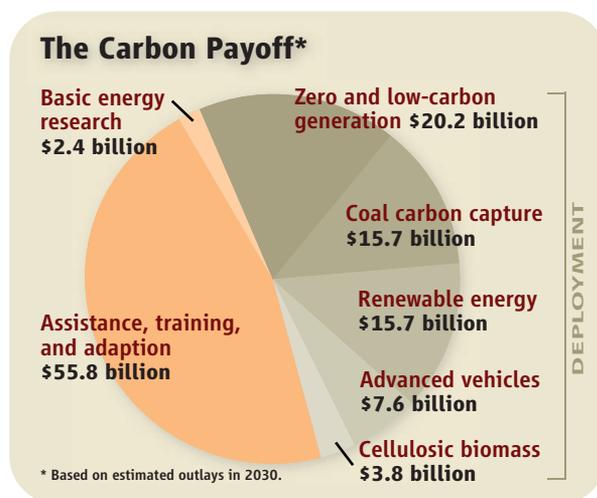
Senate Bill Would Provide Billions For Deploying Cleaner Technologies

A Senate panel has approved a sweeping climate change measure that would provide billions of dollars annually to commercialize energy sources that emit little or no carbon. Utility companies have long regarded the type of cap-and-trade system contained in the legislation (S. 2191) as a stick that punishes them for generating energy that the country needs. But lawmakers are also hoping that vast numbers of technological carrots will help curb the global rise in greenhouse gas emissions. “Many have said that we need a Manhattan Project for energy,” said Senator Max Baucus (D-MT) during the panel’s 5 December markup of the bill. “This is it.”

So far, the debate about climate legislation has focused on who should pay as the United States overhauls its energy system. The question of how to allocate the vast sums that a federally managed

system might produce, however, has received little attention. Neither has promoting synergy between the public sector and industry, on whose shoulders rests most of the burden for reducing emissions.

The Climate Security Act of 2007, approved on a vote of 11 to 8 by the Senate Environment and Public Works Committee,



would require greenhouse polluters—refineries, factories, and fuel importers, as well as power companies—to procure emission permits in order to operate. Some of the permits would be provided for free, and others would be sold through a yearly auction. (Over time, the total number of permits issued would decrease, as an incentive to reduce the level of emissions, and a larger fraction would be sold.) The bill, which the Senate is expected to take up next year, would lower U.S. greenhouse emissions by an estimated 70% by 2050. Economists have calculated that an auction could generate as much as \$3 trillion between 2012 and 2050.

Some lawmakers, such as Senator Bernie Sanders (I-VT), see those revenues as a golden opportunity to stimulate the development and use of green technologies such as solar and wind power, along with more energy-efficient products. “Sustainable energy is and will be the future of this country. We need to give it a fair shake,” he told *Science*.

Just what is fair, however, is a key unresolved question. Sanders had criticized an earlier version that would have forced renewables to compete for deployment funds ▶

Making allowances. Proceeds from a carbon credit auction would be distributed among a number of programs. The amounts assume a carbon dioxide equivalent price of \$49 per ton.

RESEARCH POLICY

NIH Weighs Big Changes in Peer Review

Peer review, a cornerstone of biomedical science, appears headed for an overhaul, to judge by a sweeping examination unveiled at the National Institutes of Health (NIH) last week. Since July, scientists have flooded two working groups established by NIH Director Elias Zerhouni with several thousand comments and ideas. This outpouring indicates that the community is frustrated by the system’s administrative burden and deeply concerned about the fate of talented new investigators. Zerhouni has promised quick action.

At a meeting of the advisory committee to the NIH director on NIH’s Bethesda, Maryland, campus last week, leaders of this review highlighted the recommendations they may deliver to Zerhouni in February. No final decisions have been made, however, and the committees are weighing everything, including shortening grant applications to seven pages from the current 25 pages and recommending an “editorial

board” model that would refer some grant proposals to outside experts.

Molecular biologist Keith Yamamoto of the University of California, San Francisco, who also serves as co-chair of the external working group that solicited comments from outside NIH, suggested ways to ease a reviewing backlog. (Lawrence Tabak, director of the National Institute of Dental and Craniofacial Research, co-chaired the internal group.) Currently, Yamamoto noted, most applicants are permitted to resubmit their proposal twice if it’s rejected the first time around, which happens most of the time. But the appeals, Zerhouni said at the meeting, have created a “traffic jam” and a system that “penalizes the new entrant to a very extreme degree.”

Yamamoto thinks reviewers ought to assess applications first for their scientific impact and, in cases that seem hopeless, communicate that unequivocally to the applicant without allowing resubmissions.

“Right now, if an application is triaged”—left unscored—“many times it’s unclear what the reason is,” said Yamamoto in a conversation after the meeting. “Here, the goal is to say, ‘Let’s stop all that.’”

Streamlining applications—perhaps by vastly reducing the amount of preliminary data that’s included—is also a possibility, as is eliminating the current scoring system and having reviewers rank only the top 10 grant proposals that they consider. Some study sections, the working groups believe, have too many members, having ballooned from the usual 15 or 20 members to as many as 80, to accommodate the increasingly specialized science being proposed. Sending applications containing certain technical details to outside experts, who would consider those elements alone and report back to the study section, is one way to slim study sections down. Shorter grant proposals, meanwhile, could allow each one to be evaluated by four people instead of the usual two.

with nuclear plants, which have been subsidized by the government for decades. The bill would now create a separate pool specifically for renewables (see chart, p. 1708).

Elizabeth Salerno of the American Wind Energy Association in Washington, D.C., applauds that change, although she says coal and nuclear plants will still retain “a competitive advantage.” Solar-energy researcher Nathan Lewis of the California Institute of Technology in Pasadena likes the fact that hundreds of millions of dollars in revenue each year would be allocated for basic research at the Department of Energy’s new Advanced Research Projects Agency–Energy. “That’s a step in the right direction but not nearly enough to make up for the deficiencies in basic research over the last 3 decades,” he says. Lewis thinks the government should spend as much on basic and applied energy research as it provides the National Institutes of Health, whose annual budget is \$30 billion.

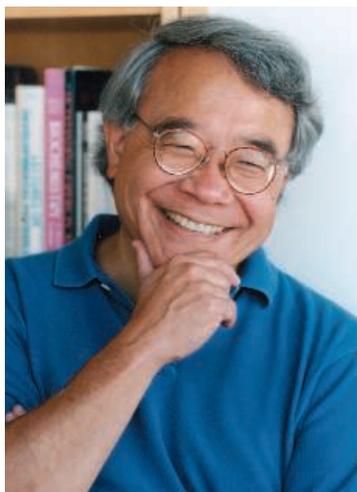
But experts believe what’s on the shelf right now could have a significant impact. A recent study estimated that current technologies, if deployed widely, could reduce U.S. carbon emissions to 80% of 2005 levels by mid-century. “We need to take the solutions we have today and apply them,” says mechanical engineer Charles Kutscher of the National Renewable Energy Laboratory in Golden, Colorado, who led the study.

Others, including some advocates of renewables, believe the government shouldn’t be charging companies for permits at all. George Sterzinger of the Renewable Energy Policy Project in Washington, D.C., complains that an auction would favor utilities in low-carbon-emitting regions, such as hydropower operators in the Pacific Northwest, whereas consumers in coal-dependent Ohio would pay 15% more, he estimates, as companies pass along the cost of their permits. Oil giant Shell complained earlier this year in a letter to lawmakers that forcing companies to pay for emission permits in addition to the cost of cleaning up their act could “withdraw capital from the industries and firms” involved and harm consumers.

Sterzinger prefers incentives, including tax breaks, as a way to spur renewables. That approach is part of an energy bill that the House of Representatives passed last week. (Senate action was pending as *Science* went to press.) An aide to Senator Joseph Lieberman (I-CT), who co-sponsored the Senate bill, agrees that companies, spurred by emissions caps, will have to do most of the heavy lifting if the country hopes to lower its carbon pollution. “The private investment will actually dwarf the public funds available,” he says. “That’s the big way this bill is a Manhattan Project.”

—ELI KINTISCH

Zerhouni and his advisory committee seemed enthusiastic, but several members wondered if the proposed changes went far enough. “The biggest [issue] on the minds of the people I talk to is getting the best people to serve on study sections,” said advisory committee member Thomas Kelly, director of the Sloan-Kettering Institute in New York City. And, he added, “I’m skeptical” whether the incentives proposed will be sufficient to coax these people to serve. Bioengineer



Plain speaking. NIH adviser Keith Yamamoto sees merit in blunt reviews.

Annelise Barron of Stanford University in Palo Alto, California, worried that slimming down the applications might mean those from less prestigious universities would not fare as well, because with shorter applications, name recognition could carry more weight. The NIH system cannot allow such a

bias or must find a way to manage it, agreed David Botstein of Princeton University, who’s working with Yamamoto on reviewing peer review. Some wondered whether blinding the names and affiliations of grantees would be possible.

No matter what the working groups decide, it’s critical that NIH retains the scientists it’s helped train and gives investigators “a sense of commitment that’s real,” says pharmacologist and cardiologist Garret FitzGerald of the University of Penn-

sylvania, an NIH adviser not directly involved in this review. “Otherwise,” as the average age of first-time grantees continues to rise, says FitzGerald, “what rational person would choose to go into a career where you begin to be independent when you’re 45?”

—JENNIFER COUZIN

CIRM in Turmoil

The California Institute for Regenerative Medicine (CIRM) is having a rough holiday season. California’s Fair Political Practices Commission is investigating a conflict-of-interest complaint against board member John Reed, president of the Burnham Institute for Medical Research in San Diego, and the state controller plans to audit CIRM. The commission is examining a letter Reed wrote to CIRM—on the advice of its board chair, Robert Klein—on the advice of its board chair, Robert Klein—to appeal its rejection of a Burnham research application. CIRM policies ban board members from “us[ing] their official position to influence a decision regarding a grant.”

In addition, the institute last week eliminated 10 applications from four universities because they had been signed by deans who serve on CIRM’s governing board. “This is unfortunate,” says stem cell researcher Renee Reijo Pera of Stanford University in Palo Alto. Those applications “were from some of our best young scientists in the state.” Klein said in a press release that board members will be given more legal guidance on the institute’s procedures. CIRM spokesperson Ellen Rose says the institute may hold a second competition to give the failed applicants another chance. “CIRM is not a private foundation and cannot be run as if it were,” says John Simpson of the Foundation for Taxpayer and Consumer Rights, the organization that complained to the state commission.

—CONSTANCE HOLDEN

Cornell’s Collider Lives

After cranking out data for nearly 3 decades, Cornell University’s storied Cornell Electron Storage Ring (CESR) collider in Ithaca, New York, will stop smashing particles in March. But the machine won’t come to a crashing halt. Last week, the National Science Foundation announced that it will become a test bed for the proposed 30-kilometer-long, multibillion-dollar International Linear Collider. ILC, which will fire beams of electrons and positrons at each other, will need circular accelerators called damping rings to cool and compress the beams. CESR is “the closest thing we have to a damping ring right now,” says Cornell’s Maury Tigner.

Started up in 1979, CESR paced the world in the study of particles called B mesons. Since 2003, it has refined measurements of more familiar D mesons. It’s the last remaining particle physics machine at a university and the only one of three U.S. colliders with a new mission lined up. And even as CESR joins the push for ILC, cash-strapped officials in the United Kingdom have announced that they may pull out of the project.

—ADRIAN CHO

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Jennifer Couzin

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