



The Act of Regulating CO₂

Both candidates say curbing U.S. greenhouse gas emissions will be a top priority in their respective Administrations. But getting Congress to pass a strong mandatory cap-and-trade system may take years. So the next president will have to decide whether to regulate carbon dioxide emissions by using the authority granted the executive branch under the Clean Air Act. Last year, the U.S. Supreme Court ruled that greenhouse gases are a pollutant that the government can regulate.

McCain says he doesn't think the act is the appropriate vehicle, whereas Obama says he might use it if lawmakers dawdle on legislating greenhouse gas limits. Climate scientists say there's no time to waste.



Cold Cash for the Poles

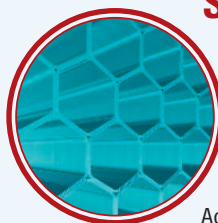
The shrinking Arctic ice cap is expected to trigger an economic free-for-all among polar-going nations seeking to take advantage of shorter shipping routes and untapped natural resources. Ironically, less sea ice will increase demand for icebreakers capable of ensuring safe passage through the once-inaccessible region.

Although several European nations have beefed up their fleets in response to such opportunities, the Bush Administration has gone in the opposite direction: Three years ago, it shifted budgetary responsibility for three icebreakers from the U.S. Coast Guard to the National Science Foundation, arguing that science is the biggest user at both poles. The House of Representatives has voted in favor of building two new icebreakers, in line with recommendations in a 2006 U.S. National Academies report. An Arctic policy review being completed by the current Administration is expected to tee up the issue for the next president, who must decide whether to seek funding for the billion-dollar ships.



Pick a Planet

The next president may have a lot to worry about at home, but he'll also have to think about the outer solar system. NASA plans to decide in January whether to launch a multi-billion-dollar spacecraft to Jupiter or Saturn, kicking off work on the agency's most ambitious space science effort in its 50-year history. That means the agency will need increasing chunks of annual funding, starting in the 2010 fiscal year that begins next October, to begin design of a spacecraft that will visit one of the two planetary systems. Launch of the probe, which may include landers for jovian or saturnian moons, would likely come near the end of the next decade. McCain has been silent on NASA's space science effort, but Obama has pledged to support a new generation of probes. The victor may also hear from advocates for a sample-return mission to the Red Planet instead.



Small Comfort

Long touted as the next "big thing," nanotechnology is already moving from research to market. Some \$50 billion worth of products already contain nanomaterials, according to a 2006 estimate. But safety concerns continue to dog the emerging field. Nanomaterials are easily absorbed by a variety of cells and tissues, with largely unknown effects. A bill to increase funding for nano safety studies and better coordinate research among the 25 agencies in the government's National Nanotechnology Initiative failed to make it through the current Congress. The Bush Administration appeared willing to go along with the additional funding but didn't see the need for additional coordination. The next president must decide if the country needs to revise its nano safety strategy to strengthen protections for the public.

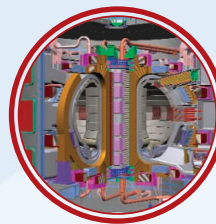


A Full Serving of Science Awaits the Next President

Many scientific issues are never discussed during the campaign. But ignoring them doesn't make them disappear. Here are 10 meaty topics that we think the 44th president will have to chew on

Being a Team Player

Can the United States be a reliable partner in international scientific collaborations? This year's elimination by Congress of the U.S. contribution to the \$15 billion ITER project, an experimental fusion reactor to be built in France, highlights the incompatibility of paying for decade-long construction projects with annual appropriations bills. U.S. proponents of the proposed International Linear Collider shake their heads when asked if their government can be counted upon, especially if the electron-smasher isn't built on U.S. soil. But multiyear spending approval is probably a pipe dream. So although both candidates may pledge allegiance to the principle of global cooperation in science, the winner will need to maintain good ties with Congress to deliver on any agreement to share the cost of expensive new scientific facilities.



Combating Bioterrorism

The new Administration will likely need to decide how institutions and researchers should conduct life sciences research in ways that reduce the chances the results could be expropriated by terrorists. The National Science Advisory Board for Biosecurity (NSABB), set up in 2005, has drafted rules for the oversight of such research that include getting scientists to indicate if their projects could be misused and having institutional committees review projects that raise a red flag. NSABB submitted the oversight framework last year to the Department of Health and Human Services. But the Bush Administration is not expected to finish the job before it leaves office. Obama and McCain have not raised the issue during the campaign.



Taking (Nuclear) Stock

At 65, the U.S. nuclear weapons complex is showing its age. The Pentagon keeps reducing the size of the stockpile as Congress ponders whether to consolidate the \$6.3 billion-a-year enterprise. More than 2000 staff positions have been erased since 2006 at the flagship Los Alamos and Lawrence Livermore labs, cuts that some blame on budget pressures caused by the high fees charged by new corporate management. The next president is scheduled to lay out his goals in a December 2009 stockpile review, which both labs hope will include developing a new weapon. Obama and McCain have neither explicitly supported the deployment of new warheads nor said they would end research on developing new weapons.



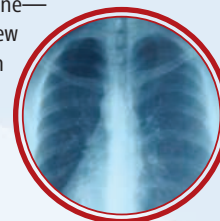
Providing Some Assistants

John Marburger's job is to advise President George W. Bush. But he doesn't hold the title of assistant to the president for science and technology, and his office is half a block from the White House. Those two aspects of the job diminish his effectiveness, according to three recent reports by science policy mavens, who say that science ought to have a higher profile in the next Administration. Both candidates have talked about restoring "integrity" to the process of making science-based decisions in their respective Administrations and pledged to fully staff the Office of Science and Technology Policy that Marburger runs. This month, Obama also promised to upgrade the title of his science adviser. Will that be enough to give science a real seat at the table of power? Stay tuned.



More Intelligent Medicine

No buyer of drugs and medical devices spends more—or has a greater ability to influence the quality of medicine—than the U.S. government. But programs like Medicare avoid any direct consideration of cost when they buy a new therapy. That may change. Facing a widening deficit in the federal budget, the next Administration will have an incentive to vet big-ticket proposals—such as CT screening for lung cancer or exotic drugs that offer minimal benefits—before accepting them. Advocates of evidence-based medicine in Congress have proposed a new research center that would explicitly compare diagnostic technologies and treatments based on public value. Shunted aside in 2007–08, the idea is likely to return as the need grows for rational decision-making.



Fishing for Answers

Many U.S. fisheries remain in crisis, especially some commercially important species on the East Coast that remain chronically depleted. The next president will have to decide whether to mobilize the government to stop overfishing. Congress told the nation's eight Fishery Management Councils 2 years ago to achieve that goal by 2010 when it reauthorized the major U.S. fisheries program (*Science*, 22 December 2006, p. 1857). Some councils have resisted, but the National Oceanic and Atmospheric Administration's National Marine Fisheries Service has the authority to reject catch limits that aren't strict enough. Although both candidates say they support sustainable fisheries, neither has spelled out how he would make it happen.

