

## Q&amp;A

# Questioning the candidates, part two

Barack Obama accepted Nature's invitation to answer 18 science-related questions in writing; John McCain's campaign declined. Here are Obama's answers to additional questions that did not appear in our print magazine. Wherever possible, *Nature* has noted what McCain has said at other times on these topics.



## Should the United States take the lead in signing up to binding international emissions targets? How should it proceed if China and India do not initially agree to such a mandate?

**Obama:** As the world's largest per capita emitter, most vibrant economy and technological leader, I believe the United States must assert leadership to fight global warming both at home and abroad. By adopting an aggressive cap on domestic emissions, the US can recapture the moral authority to lead the world toward an effective and equitable solution on global climate change. I will seek to engage China and India in global climate-change reduction efforts, and I will create a 'global energy forum' — a body that will include the world's highest emitters from the developed and developing world to apply pressure to developed and developing nations alike to meaningfully reduce their carbon emissions. I will also re-engage the United States with the post-Kyoto international climate negotiations to restore US leadership and pressure on the rest of the world to take similar steps to combat this truly global problem.

**McCain** has said he would actively lead United Nations efforts to develop international emissions targets. His platform calls for developing "incentives for rapid participation by China and India", without specifics on what those might be. In a speech in May, he said that the United States had an "obligation to act" even if China and India do not sign up to such an agreement.

## Would you support a ban on new coal-fired power plants that do not incorporate carbon capture and storage?

**Obama:** I recognize that global warming is one of the most significant challenges that we face. To that end, I support research into new technologies to help solve the climate-change problem, including investing in technology that could make coal a clean-burning source of energy. We must do what it takes to get this technology online in our new coal plants as well as retrofit our existing plants. As president, I will significantly increase the resources devoted

to the commercialization and deployment of low-carbon coal technologies and use a broad range of mechanisms to commercialize clean-coal technology. I will direct my Secretary of Energy to enter into public-private partnerships to develop five 'first-of-a-kind' commercial-scale coal-fired plants with carbon capture and sequestration.

**McCain** has said he would commit \$2 billion per year to research on clean-coal technologies. His goal is to commercialize these technologies and then export them to other countries, such as China.

## What would your administration do to further the country's commitment to climate science?

**Obama:** I will fully support scientific efforts to understand climate change and the likely effects it will have on our society and the world's ecosystems. I will depoliticize climate science in the federal government and ensure that our policy-makers rely on the best scientifically based evidence available. I will also expand on existing federal efforts to examine climate science, ensure that there is greater cooperation across the relevant federal agencies that already analyse aspects of climate science, and seek to bolster US engagement in international climate science initiatives.

**McCain** has said he would continue to support the US Global Change Research Program, which coordinates the nation's climate-change research programmes.

## Would you restore the position of presidential science adviser to be a special assistant to the president, at the Cabinet level?

**Obama:** I am committed to restoring government reliance on sound, non-ideological advice at the highest levels of government and all my appointees will be instructed to make decisions in a manner that respects available scientific evidence.

**McCain** told *ScienceDebate2008*, an online science-advocacy group, that he supports "having

a science and technology adviser within the White House staff and restoring the credibility of OSTP [Office of Science and Technology Policy] as an office within the White House structure".

## President Bush's American Competitiveness Initiative is meant to double over ten years the physical-sciences budgets at the National Science Foundation (NSF), the Department of Energy (DOE) Office of Science and the National Institute of Standards and Technology. Do you support this increase in physical-sciences spending? If so, would that come at the expense of possible increases at the National Institutes of Health (NIH), whose budget has been effectively flat for the past five years?

**Obama:** I believe that investments in research and development — in the physical sciences and other fields — have been essential for the competitiveness of the US economy and for helping us meet national goals in energy, the environment, health care and many other areas. I co-sponsored the America COMPETES Act and successfully included multiple provisions to ensure more Americans have the opportunity to enter and advance through science and technology fields. I have been greatly disappointed that the Bush administration has failed to invest the necessary money in this important effort.

Intransigence on the budget made it impossible to find the money needed to support its goals. It will plainly be impossible to meet these goals if my opponent in this election follows through on his promise to freeze domestic discretionary spending. I, however, am strongly committed to doubling basic research budgets over ten years at federal agencies that include the NSF, the Office of Science in the DOE and the National Institute of Science and Technology. At the same time, I am committed to predictably increasing the budget of the National Institutes of Health at a similar rate, and am pleased that there is bipartisan consensus to roll back this administration's lack of investment in important life-sciences research.

**McCain** also voted in favour of the America COMPETES Act and says he has “supported increased funding at the DOE, the NSF and the NIH for years and will continue to do so”. He says that he recognizes that basic research drives scientific breakthroughs and hence the country’s innovation economy. One of his main fiscal points is that money should be distributed on the basis of peer review and not through Congressionally-mandated ‘earmarks’, or money designated for a specific project by a specific lawmaker.

**Does America need a new generation of nuclear weapons? If not, what is the purpose of the nuclear-weapons laboratories?**

**Obama:** As president, I will set a new direction in nuclear-weapons policy and show the world that America believes in its existing commitment under the Nuclear Non-Proliferation Treaty to work to ultimately eliminate all nuclear weapons. I fully support reaffirming this goal, as called for by George Schultz, Henry Kissinger, William Perry and Sam Nunn, as well as the specific steps they propose to move us in that direction. I’ve made it clear that America will not disarm unilaterally. Indeed, as long as states retain nuclear weapons, the United States will maintain a nuclear deterrent that is strong, safe, secure and reliable. But I will not authorize the development of new nuclear weapons. And I will make the goal of eliminating nuclear weapons worldwide a central element of US nuclear policy.

The DOE’s weapons laboratories have played a key role in national security and many other areas and will continue to do so. I will build on my record in the US Senate to strengthen international agreements that will make it possible to greatly reduce nuclear weapons. This does not mean that we should in any way reduce our efforts to ensure the safety and reliability of our existing nuclear stockpile. The national laboratories are essential for this mission and for many other critical missions in national security, homeland security, nonproliferation, nuclear power, computational sciences, life sciences, environmental technologies and other fields. The national laboratories are a critical national science and technology resource, and I will ensure that these resources are supported and focused on the science and technology missions most critical to our country in the twenty-first century.

**McCain’s** top foreign policy adviser, Randy Scheunemann, said this summer that the senator would consider new nuclear weapons only if they met key criteria including deterrence,

arsenal reduction and improved global nuclear security. In July, on a visit to New Mexico, McCain told reporters he would set the local Los Alamos National Laboratory on a “national mission” to study ways to achieve energy independence.

**Year-by-year funding subject to congressional budgets has made the United States an unreliable partner in large international research projects such as ITER and the International Linear Collider. Would you support a new way of providing contributions to major international programmes on a multi-year basis?**

**Obama:** Many pressing research challenges can best be addressed through international collaboration. I will work hard to ensure that we leverage federal research dollars by engaging international partners in projects, including technologies such as carbon capture and sequestration. I will also encourage research collaboration in areas where multinational investments are essential, such as medical research on malaria and other diseases. These programmes will be fully funded as a part of my strong commitment to double basic research budgets.

**What would you do that would make America less vulnerable to bioterrorism in 2012 than it is today?**

**Obama:** It’s time for a comprehensive effort to tackle bioterror. We know that the successful deployment of a biological weapon — whether it is sprayed into our cities or spread through our food supply — could kill tens of thousands of Americans and deal a crushing blow to our economy.

Overseas, I will launch a Shared Security Partnership that invests \$5 billion over 3 years to forge an international intelligence and law-enforcement infrastructure to take down terrorist networks. I will also strengthen US intelligence collection overseas to identify and interdict would-be bioterrorists before they strike and expand the US government’s bioforensics programme for tracking the source of any biological weapon. I will work with the international community to make any use of disease as a weapon declared a crime against humanity.

And to ensure our country is prepared should such an event occur, we must provide our public-health system with the surge capacity to confront a crisis and improve our ability to cope with infectious diseases. I will invest in new vaccines and technologies to detect attacks and to trace them to their origin, so that we can react in a timely fashion. I have pledged

to invest \$10 billion per year over the next 5 years in electronic health information systems to not only improve routine health care, but also ensure that these systems will give health officials the crucial information they need to deploy resources and save lives in an emergency. I will help hospitals form collaborative networks to deal with sudden surges in patients and will ensure that the United States has adequate supplies of medicines, vaccines and diagnostic tests and can get these vital products into the hands of those who need them.

We also have to expand local and state programmes to ensure that they have the resources to respond to these disasters. I will work to strengthen the federal government’s partnership with local and state governments on these issues by improving the mechanisms for clear communication, eliminating redundant programmes and building on the key strengths possessed by each level of government. I introduced legislation that would have provided funding for programmes in order to enhance emergency care systems throughout the country.

I will build on America’s unparalleled talent and advantage in STEM [science, technology, engineering and mathematics] fields and the powerful insights into biological systems that are emerging to create new drugs, vaccines, and diagnostic tests and to manufacture these vital products much more quickly and efficiently than is now possible. Unfortunately, the Bush administration has failed to take full advantage of the Bioshield initiative. Because of the unpredictability of the mode of biological attack, I will stress the need for broad-gauged vaccines and drugs and for more agile and responsive drug development and production systems. This effort will strengthen the US biotech and pharmaceutical industry and create high-wage jobs.

**McCain,** in response to a ScienceDebate2008 question about a potential H5N1 avian influenza epidemic, outlined a four-part strategy to deal with pandemics or deliberate biological attacks; key aspects are preparedness, communication, surveillance/detection and response/containment. In terms of specifics, he called for more research into next-generation automated sensors to detect biological agents and real-time information sharing with first responders. ■