

The winning chemistry

As the US prepares for its presidential election, Rebecca Trager looks at where each candidate stands on science

As part of his many presidential duties, the next incumbent of 1600 Pennsylvania Avenue will have to steer the US through a minefield of challenges to science and technology – among them, climate change, energy security, and religious and ethical dilemmas. Democrat Barack Obama and his Republican rival John McCain each claim that they are the one who can better shape the future of the world's leading science nation.

Which candidate has the confidence of the science-based business community can be largely deduced by following the money. The chemical industry is by and large remaining pro-Republican, as it traditionally has. McCain is the top recipient of donations from the chemical and related manufacturing sector, with nearly \$283 000 (£130 000) in pledges – compared to less than \$112 000 contributed to

In short

● **The winning US presidential candidate will have to manage US science at a difficult time**

● **Barack Obama and John McCain both support increased public funding for basic research, but Obama has an explicit plan to double key agencies' funding over 10 years**

● **Financial support from chemistry-led business is split between the Republican and Democrat candidates, with the chemical industry favouring McCain and the pharmaceutical industry preferring Obama**

Obama, according to data from the nonpartisan research group Center for Responsive Politics (CRP).

During the last US presidential election, by contrast, while Democrat John Kerry received a similar contribution as Obama from members of the chemical industry, his Republican counterpart George Bush garnered over \$675 000 – a figure that is nearly 140 per cent above McCain's.

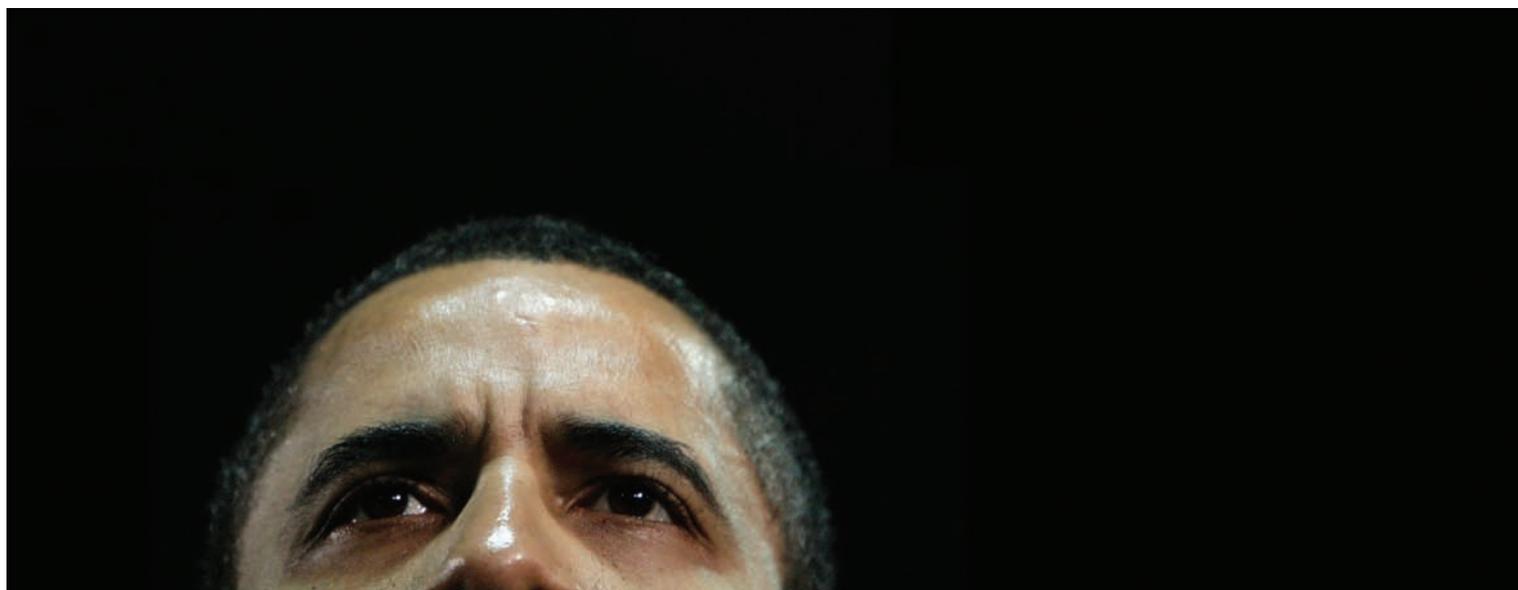
Comparisons to Bush aside, the chemical industry is backing McCain. The longstanding Republican promise to increase prosperity through a reduction in taxes is seen by many in industry as fuelling the free market and benefiting the US economy. Obama may also have alienated the chemical industry somewhat when he coauthored legislation to tighten chemical plant security.

Introduced in 2006, the Chemical Security and Safety Act aimed to establish more stringent rules for security enhancements, and safer technologies.

In introducing the bill, Obama expressed concerns about policies that exempt thousands of chemical plants from any regulations unless the US Department of Homeland Security considers them high risk. He wanted some requirement for chemical facilities to consider switching to safer chemicals, and he favoured a clear policy statement affirming the authority of states to assume stronger chemical security measures than those adopted at the federal level.

Over-regulation

McCain has expressed concern about the possibility that chemical plant regulations could



lead to excessive red tape and paperwork. Last year, he told the League of Conservation Voters (LCV) that he was worried about government controlled chemical substitution programmes, as well as requirements for the thousands of US facilities that use or store chemicals to prove to the government that safer materials don't exist. Such policy approaches 'could become exercises in excessive bureaucracy and paperwork, rather than truly effective and appropriate homeland security requirements,' McCain warned.

There are some notable areas of overlap between the science policies of McCain and Obama. For example, both candidates support expanding H1-B student visas to attract the world's best minds to the US. The presidential contenders also both renounce the politicisation of science that has purportedly taken place during the Bush administration, and they want to bolster the scientific advisory process used by government agencies.

In addition, the two men have said the R&D tax credit should be made permanent – which would give private industry an incentive to expand research investments – and they agree on the need to increase protection of intellectual property by updating and reforming the US copyright and patent systems.

McCain and Obama both want to broaden the restrictive embryonic stem cell research funding rules that the current president, George W Bush, put in place seven years ago. Here McCain is actually at odds with the official Republican

position. In its draft platform, released in September, the party states its support for the expansion of stem cell research 'without the destruction of embryonic human life' – with, for example, adult stem cells and umbilical cord blood.

Agreeing to differ

But even within overlapping policies, there are significant differences between the two camps. McCain hopes not to rely on embryonic stem cells in the future, and, in a recent response to a survey from science advocacy group ScienceDebate2008, he reinforced his own support for 'amniotic fluid and adult stem cell research'.

Obama has vowed to reverse Bush's 2001 policy that limits federal funding for research using stem cells to those studies using cells derived from embryos created before 9 August 2001.

Furthermore, although both candidates concur that the US government's funding of basic research is currently insufficient, Obama has been more explicit about his plans to address the issue, repeatedly pledging to double the amount of federal funding for research.

Now the chair of Obama's science advisory committee, Nobel laureate Harold Varmus says that Obama would specifically aim to double funding for the US National Institutes of Health (NIH), National Science Foundation (NSF), and the Department of Energy's (DOE) office of science over 10 years. The US government largely funds chemistry through these three agencies.

'Doubling science funding is a nice concept, but there will be competing demands for the money'

'All those agencies in our plan for his presidency would be undergoing predictably steady increases in funding... so chemistry would be very strongly supported,' says Varmus.

But in August, one of McCain's senior policy advisers, Douglas Holtz-Eakin, was critical of the Democratic candidate's promise. 'Doubling is a nice fun number for political purposes. It's clean, it's smooth. But it doesn't reflect a balancing of political priorities,' he told National Public Radio. 'There will be competing demands for funds.'

Holtz-Eakin went on to say that 'good scientists' should 'make the case for their research money, and the senator will be happy to listen to that case and fund appropriately'.

These statements from the McCain camp have caused some in the research community to conclude that his promise to freeze most domestic spending extends to flat federal funding for science.

'McCain is already struggling to distance himself from the policies of the Bush administration, but a wimpy stance on science funding will do little to convince Americans that he will be able to push the US through difficult economic times by investing in science and technology,' says Michael Stebbins, a geneticist who serves on the board of advisors for the lobby group Scientists and Engineers for America.

Good advice

While Obama's science advisory committee is made up of over 30 scientists and policy experts, and is growing, McCain's system for

Who has the vision to shape the future of US science?



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receiving input on S&T issues appears more opaque.

The McCain camp was unable to provide *Chemistry World* with a campaign member or advisor to answer questions about his S&T platform, and did not provide the name of McCain's main scientific advisor. However, members of the research community identify former Hewlett-Packard CEO Carly Fiorina as one of the candidate's chief technology consultants.

McCain has also recruited former eBay chief executive Meg Whitman as his campaign's national co-chairwoman, and has Cisco Systems' CEO John Chambers as both a fundraiser and an advisor.

But some say it is not clear that McCain has put together a science team that matches Obama's. Many also say McCain's technology plan, released in mid-August, is sparse at 2700 words. By comparison, Obama issued his technology plan back in November, and it is nearly twice as long as his rival's. His science credentials have also been bolstered by his appointment of Delaware senator Joe Biden as his presidential running mate. Biden's voting history on science policy has been in support of strengthening research funding, and he has spoken out on the importance of alternative sources of energy in combating climate change.

McCain announced his own choice of vice president – Alaska Governor Sarah Palin – in August. Some have gone so far as to call Palin 'anti-science', noting her support for creationism and denial that global warming is caused by human activity. Palin has made public statements that creationism should be taught alongside evolution in the state's public classrooms, and she told US news website Newsmax in a 29 August interview: 'A changing environment will affect Alaska more than any other state, because of our location. I'm not one though who would attribute it to being man-made.'

'I don't think anybody knows what McCain's science policy is,' says Varmus. 'The only comparison we can make now is with Bush, so the McCain team ought to get something out there before everyone just keeps comparing Obama on the issues with Bush.'

Indeed, McCain has committed a few science gaffes during his campaign and tenure in the Senate. Earlier this year, for example, he admitted to several media outlets



that he is not computer-literate and doesn't use the internet. He is also criticised by some researchers as unfairly targeting a series of federally funded science projects in the name of highlighting some potential funding cuts. The projects he poked fun at include research examining the influence of methane emitted by cattle on atmospheric ozone, and a grizzly bear DNA study.

But supporters insist that McCain has significant experience with science and technology issues, citing his long-term membership of the Senate Commerce, Science and Transportation Committee, the jurisdiction of which includes

John McCain's choice of Sarah Palin as his running mate has worried the scientific community

How the chemical industry's top five political donors split their money between the Republican (red) and Democratic parties (blue)

Huntsman: \$274,800



Air Products & Chemicals: \$244,225



Dow Chemical: \$190,013



DuPont: \$171,538



Ashland: \$163,658



climate change, space, and product safety. In fact, McCain chaired the influential panel on and off between 1997 and 2005.

And some insiders consider McCain to be more pro-technology than Obama, pointing, for example, to his support of nuclear energy – which he has called 'one of the cleanest, safest and most reliable energy sources on Earth'. McCain has a goal of constructing 45 new nuclear power plants by 2030, with a longer-term objective of building 100 new nuclear plants. He has emphasised that nuclear power produces 20 per cent of America's power, yet the country has not started construction on a new nuclear power plant in over 30 years.

Energising the election

Obama has been more cautious in his support of nuclear energy, saying that the US should 'explore nuclear power as part of the energy mix'. But he has criticised McCain's plant development proposals, saying that they make little sense without a clear plan for the safe disposal of nuclear waste. In the Senate, he sponsored legislation to mandate that spent fuel from nuclear power plants be tracked and accounted for.

Far more comfortable with alternative energy sources, Obama wants to invest \$150 billion over the next decade in research on projects developing solar and wind power, and biodiesel. In addition, he strongly supports corn subsidies for American farmers to produce the plant-derived fuel ethanol. It's not a surprising position considering ethanol subsidies are popular in the American Midwest, and Obama is from Illinois.

In contrast, McCain does not support subsidies for such alternative forms of energy, but does endorse subsidies for nuclear energy. He also wants to repeal corn-based ethanol mandates.

Obama's support for biofuels has already caused controversy. Daniel Kammen, a University of California, Berkeley, energy and resources expert who is one of Obama's senior energy and environment advisors, recently published a paper warning about problems with biofuels. What's more, Kammen has publicly expressed doubt over their viability as alternatives to fossil fuels.

Obama has also made one substantial blunder that worries the scientific community. Back in November 2007, he proposed to



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fund his \$18 billion education plan by delaying for five years Nasa's Constellation programme, which aims to develop the next generation of spacecrafts. The proposal led to heavy criticism from the science community as well as McCain, who emphasised his opposition to such cuts.

Opponents argued that postponing Constellation would mean that the US wouldn't have its own human launch capability for almost a decade. Obama eventually reversed course, and in August of this year, he reported instructing his staff to find another offset for his education plan.

Pharma for Obama

Despite the widespread perception that McCain is the more pro-business candidate, pharmaceutical industry executives and employees have contributed more than three times as much to Obama's campaign as they have to McCain's. CRP's analysis shows they gave roughly \$450 000 to Obama, versus less than \$133 000 to McCain.

In terms of donations that include pharmaceutical companies as well as makers of medical devices and other health-related products,

Obama is ranked as the top recipient, with nearly \$850 000, and McCain has received less than half that amount, at under \$350 000. The figures stand in stark contrast to the last presidential race, during which the drug industry gave Bush

Pharma's top five political donors divide their contributions more evenly between the Republicans (red) and the Democrats (blue)

Pfizer: \$1,101,278



Amgen: \$1,022,955



Johnson & Johnson: \$877,934



GlaxoSmithKline: \$827,791



Roche: \$659,189



almost double the donations of his Democratic opponent, John Kerry.

Big pharma's support of Obama could represent a backlash against McCain's calls for re-importation of cheaper drugs from other countries, and his very public rebuke of the industry. 'Only McCain has taken on big tobacco, drug companies, fought corruption in both parties,' boasts the narrator in a political advert McCain debuted in August.

With the environment, healthcare and especially climate change high on the US political agenda, both candidates are vying to present themselves as the safest pair of hands for a US driven by knowledge and innovation. After 4 November, one of them will take up the presidential mantle and will have to prove it.

Rebecca Trager is US correspondent for Research Day USA, and is based in Washington, DC

Further reading

- The Center for Responsive Politics: www.opensecrets.org
- John McCain's technology agenda: www.johnmccain.com/Informing/Issues/CBC-D3A48-4B0E-4864-8BE1-D04561C132EA.htm
- Barack Obama's technology agenda: www.barackobama.com/issues/technology/