

Light at the end of the tunnel

An emphatic and clear status report on global warming opens the way for action — presenting new risks.

The release of the 2007 report of the Intergovernmental Panel on Climate Change (IPCC) last Friday marks an important milestone (see pages 578–585 and 595–598). Following the scientific consensus that has been apparent for some time, a solid political consensus that acknowledges the problem finally seems to be within reach. But achieving this outcome brings its own risks.

Until quite recently (perhaps even until last week), the general global narrative of the great climate-change debate has been deceptively straightforward. The climate-science community, together with the entire environmental movement and a broad alliance of opinion leaders ranging from Greenpeace and Ralph Nader to Senator John McCain and many US evangelical Christians, has been advocating meaningful action to curtail greenhouse-gas emissions. This requirement has been disputed by a collection of money-men and some isolated scientists, in alliance with the current president of the United States and a handful of like-minded ideologues such as Australia's prime minister John Howard.

The IPCC report, released in Paris, has served a useful purpose in removing the last ground from under the climate-change sceptics' feet, leaving them looking marooned and ridiculous. However, this predicament was already clear enough. Opinion in business circles, in particular, has moved on. A report released on 19 January by Citigroup, *Climatic Consequences* — the sort of eloquently written, big-picture stuff that the well-informed chief executive reads on a Sunday afternoon — states even more firmly than the IPCC that anthropogenic climate change is a fact that world governments are moving to confront. It leaves no question at all that large businesses need to get to grips with this situation — something that many of them are already doing.

Tough choices

So then, the enemy is vanquished and the victors can rejoice? Hardly. In fact, the pending retreat from the stage of the president of the United States and his allies leaves those who do acknowledge the severity of the problem facing an even greater challenge than before. The world now broadly accepts that we have a problem, if not a crisis. So what is to be done?

The policy choices that lie ahead are more daunting than political leaders (or the media) have thus far been ready to acknowledge. In a sense, twenty years of frustrating trench-warfare with the sceptics has prevented a rational discussion about what needs to be done from even taking place.

At present, the political response to the situation is, in large part, incongruous. We need to restrict emissions in the developed world, and some steps are being undertaken to do just that, chiefly through the much-maligned Kyoto Protocol. We need to develop clean energy sources, and these are being pushed ahead quite rapidly, although each one — nuclear power, biofuels, wind power and hydropower, for example — creates its own environmental battlefield. Steps are

also being taken to build systems for large-scale carbon capture and storage, and to improve the efficiency with which energy is used (see pages 586–591).

The trouble is, none of this is even close to being sufficient to meet the challenge. Hybrid cars are being purchased (and often allow their lucky drivers special access to empty highway lanes). David Cameron, the leader of Britain's Conservative Party, has sought planning permission to erect a wind turbine in his back garden. And Pink Floyd and Pearl Jam have declared that their most recent world tours would be 'carbon neutral'. But we are all vaguely aware that all of this is nowhere near enough.

Economic sacrifice

Even the most progressive governments continue to put the issue of climate change on the back seat behind their fundamental commitment to strong economic growth, which is needed to ensure political survival (in developed countries) and to enable human dignity (in developing countries). So in a typical European nation, for example, governments are calling for strenuous emissions cuts while also planning airport expansions that anticipate a further tripling over the next twenty years of air travel — the fastest-growing source of emissions, and one not capped by the Kyoto Protocol.

The fundamental difficulty here is that it has been politically impossible to accept that fighting global warming may involve some economic sacrifice, at least while the sceptics were in the picture. As these are vanquished, it becomes possible — and indeed necessary — to start the discussion.

Similarly, it has been hard to talk about actions that need to be taken to mitigate the damage already certain to be caused by climate change and associated rises in the sea level, as such steps were regarded as a capitulation to those who just want to keep emitting greenhouse gases. This is no longer the case (see page 597). Mitigation, which can take many forms ranging from the Thames Barrier in London to the introduction of drought-resistant crop strains in the Sahel and the establishment of a proposed climate-change adaptation fund, needs to be squarely on the agenda, alongside emissions cuts.

A similar relaxation arises with regard to revised negotiations for the second stage of the Kyoto Protocol. There is a case for opening the second phase beyond a simple extension of the cap-and-trade proposals that made up the core of the first. US President George W. Bush will remain a participant in such negotiations until the end of 2008. But even before then, talks should include all the options open to a planet that is now ready, at last, to acknowledge the fix it is in. ■

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Virgin offers big reward for capturing carbon

A US\$25-million prize — one of the largest science prizes around — is on offer to the inventor of a device that will remove 'significant amounts' of carbon dioxide from the atmosphere.

"The winner must be able to demonstrate a commercially viable design which will result in the net removal of anthropogenic, atmospheric, greenhouse gases each year for at least ten years without countervailing harmful effects," state the rules of the Virgin Earth Challenge competition.

Among the judges are NASA climate scientist James Hansen; James Lovelock, inventor of the Gaia hypothesis; UK environmentalist and retired diplomat Crispin Tickell; and Australian conservationist and author Tim Flannery.

The competition is open for at least the next five years. British billionaire entrepreneur Richard Branson and former US vice-president Al Gore launched the prize on 9 February in London.

Historian to lead science forward at Harvard

Harvard University's new president, Drew Gilpin Faust, is a historian. But she is expected to continue many of the science-based initiatives that her predecessor, the controversial Larry Summers, put in place.

Plans are moving apace to create a science research complex in the Boston suburb of Allston — one of Summers' signature projects. He announced his resignation last February, in part over the furore about his comments on differences between men and women in science.

After her appointment on 11 February, Faust said that much remained to be done to address gender inequality in the sciences. She was the founding dean of the Radcliffe Institute for Advanced Study, a former women's college, which has put on science conferences on topics such as computational biology and tissue engineering. She also led two task forces looking at the status of



Pointing the way: Harvard boss Drew Gilpin Faust wants to address sexual inequality in science.

K. SNIBBE/HARVARD

Horse genome to help human conditions

Twilight, the thoroughbred mare pictured here, is now the gold standard for all other horses: her DNA has been sequenced as the reference genome of the horse (*Equus caballus*).

The draft sequence, released on 7 February, should help the study of human conditions such as allergic disease, arthritis, exercise physiology and fertility. These studies will be aided by the fact that people have been breeding horses for 4,000 to 6,000 years and keeping close records of the bloodlines, allowing particular genes to be traced back through time.



D. ANTICZAK/CORNELL UNIV.

women faculty at Harvard, including one on women in science and engineering, following Summers' controversial remarks.

Biologist Thomas Cech, head of the Howard Hughes Medical Institute in Chevy Chase, Maryland, was also a finalist for the president's job, but withdrew from the running last month.

UK's Diamond synchrotron turns on the lights

Britain's Diamond synchrotron, a £260-million (US\$505-million) device that is one of the country's largest pieces of new scientific infrastructure in decades, welcomed its first users late last month.

Diamond's initial users will study materials used in computer memories, a protein involved in cancer, and mineral samples from a meteorite that could shed light on conditions in the early Solar System. The facility currently has seven beamlines, producing X-rays with energies of between 100 and 20,000 electronvolts. It has funding to build another 15, which should all be online by 2011.

The debut of Diamond, situated near Oxford, marks the return of a world-class synchrotron to Britain: the first synchrotron was run in London in 1946. In 1993, government advisers warned that the country needed to build a new device to compete with systems elsewhere.

Catholic college sells land, but blocks stem-cell work

The University of Sydney in Australia will not conduct fetal stem-cell research in a new Aus\$350-million (US\$270 million) biomedical research centre planned on land obtained from a Roman Catholic college.

The 5 February compromise was reached after the university paid at least Aus\$11 million to St John's College for land the Catholic school had controlled under a trust. St John's governing council sought the stem-cell restrictions even though the university had not planned such research at the new centre, which is expected to be completed by 2012.

University officials say they don't believe the agreement will create a precedent limiting stem-cell research at Australian public universities, such as Sydney.

Mars probe gets tunnel vision — in monochrome

The High-Resolution Imaging Science Experiment (HiRISE) on board the Mars Reconnaissance Orbiter — the newest and most powerful craft to arrive at the red planet — has lost its peripheral vision. And its colour vision is fading too.

Seven of HiRISE's 14 detectors are sending back spurious data, the mission team reports, and one of the four colour detectors has stopped working completely. This has led to only a 2% loss of signal so far, but the problem looks set to hit all of the detectors eventually.

"We do think it's a systematic problem for all of them," says Alfred McEwen, HiRISE's principal investigator, who is based at the University of Arizona in Tucson. "It's going to be a real irritant as it worsens."

Correction

The Editorial 'Light at the end of the tunnel' (*Nature* **445**, 567; 2007) should have referred to projects such as the Thames Barrier as 'adaptation' not 'mitigation'. In the related News story 'What we don't know about climate change' (*Nature* **445**, 580; 2007), the 2001 IPCC estimate for the range of sea-level rise should have read 9 to 88 centimetres, not millimetres.