

Joint academies initial response to the Council for Science and Technology's review of Government's progress on nanotechnologies

- We welcome the Council for Science and Technology's (CST) two year review¹ of the Government's response to our 2004 report: *Nanosciences and Nanotechnologies: opportunities and uncertainties*². CST has endorsed many of the concerns that we expressed about the Government's progress in October 2006³.
- Nanotechnologies offer a range of potential benefits in areas including healthcare, information and communication technologies, renewable energy, lightweight materials and water purification. Most pose no new risks to health, safety or the environment but uncertainties remain about the health, safety and environmental impacts of some free manufactured nanoparticles and nanotubes. We share CST's concern at the imbalance between the amounts of funding allocated to the development of new applications compared with that being spent on the research needed to underpin the responsible development of these technologies.
- We recognise that the Government has made progress on a number of the commitments that it made in response to our report⁴. However it has not properly honoured its vitally important commitment to 'an immediate programme of research' to address the potential health, safety and environmental hazards of some nanomaterials. We agree with CST that that the amounts of funding committed to such research programmes have been 'tiny' and that, as a consequence, there has been 'little tangible advance in knowledge' in these areas.
- Government must act quickly to address the knowledge gaps that it has identified in its reports and that have been highlighted by its own regulators. We expect the Government to commit to a substantial funding initiative in response to CST's review.
- We agree with CST's priorities for a dedicated research programme. The programme must provide funding for research on the toxicity, epidemiology, persistence and bioaccumulation of manufactured nanoparticles and nanotubes as well as their exposure pathways. In addition, methodologies and instrumentation for monitoring nanoparticles and nanotubes in the built and natural environments need to be developed.
- We are pleased that CST recommends that the Government invest £5-6 million per annum over 10 years for this dedicated research programme. This is consistent with the recommendations made our 2004 report.
- We still believe that a research centre (potentially a virtual centre) is the best mechanism for addressing these knowledge gaps as it could provide a focus for national and international research collaboration and an information resource for regulators, other policymakers and industry. It would also provide a mechanism for building the capacity that is needed in this relatively new area of research.
- CST suggests that the Nanotechnologies Research Co-ordination Group might have a more direct role in delivering the required funding programme. In the absence of the dedicated research centre that we recommend this suggestion is worthy of further consideration. However, allocation and evaluation of funding should involve rigorous peer review.
- CST also suggests that part of Government programmes that support the nanotechnology industry should be ring fenced to research the toxicology of nanomaterials. If this research is undertaken by industry we would advocate independent academic scrutiny of this research, to make sure funding is spent appropriately, and open publication of the results.

- We welcome the prominent role that Government has taken in international initiatives relating to standards, regulation and coordination of research. However, we agree with CST that the Government risks losing its credibility in international discussions if UK researchers are unable to take part in collaborations due to insufficient UK research effort.
- We concur with CST's conclusion that the Government has 'not taken sufficient action to fill the gaps in the knowledge base that would resolve the uncertainties surrounding nanotechnologies'. We believe that the Government is being short-sighted, as reducing the uncertainties concerning nanomaterials is a vital step in ensuring nanotechnologies are well regulated technologies which inspire the confidence of both investors and the public.
- There is also a real need for a coherent research programme into the social and ethical aspects of nanotechnologies. The priorities for this research need to be developed. This research could provide a basis for developing future public dialogue activities and for involving social scientists in the education and training of postgraduate scientists in the ethical and social implications of advanced technologies.
- We share CST's disappointment that public engagement initiatives have not been closely linked to policy making processes, and also share their concern about the future of public dialogue activities in this area once the current programmes come to an end. We are pleased that CST supports our recommendation that the business community should become better engaged in these activities.
- We urge industry to work with Government to reduce the uncertainties around health and environmental impacts of nanomaterials, submitting data to the Voluntary Reporting Scheme and contributing funding to appropriate research.
- We agree with CST's overall conclusion that the UK has lost its international leadership role in the responsible development of nanotechnologies and we echo its recommendation that the Government takes 'the swift and determined action necessary to regain this role'.
- The Academies will consider the CST's report in detail and will comment further if appropriate.

¹ Council for Science and Technology (2007) *Nanoscience and nanotechnologies: A review of Government's Progress on its Policy Commitments*. Council for Science and Technology: London.

<http://www2.cst.gov.uk/cst/business/nanoreview.shtml>

² Royal Society and Royal Academy of Engineering (2004) *Nanoscience and nanotechnologies :opportunities and uncertainties*. Royal Society: London

<http://www.nanotec.org.uk/finalReport.htm>

³ Royal Society and Royal Academy of Engineering (2006). *Nanoscience and nanotechnologies: opportunities and uncertainties- Two-year review of progress on Government actions: Joint academies' response to the Council for Science and Technology's call for evidence*. Royal Society: London

<http://www.royalsoc.ac.uk/document.asp?latest=1&id=5451>

⁴ HM Government (2005) Response to the Royal Society and the Royal Academy of Engineering report: Nanoscience and nanotechnologies: opportunities and uncertainties. Department of Trade and Industry: London http://www.dti.gov.uk/science/science-in-govt/st_policy_issues/nanotechnology/page20218.html