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Materials Fare Well in U.K. Government's Renewed Push for R&D

While scientists in the United Kingdom may deliver a large number of highly cited papers on their research, their work has not translated into marketable technologies as often as the funding agencies in the United Kingdom would like. That is why the Department of Trade and Industry (DTI), the government department responsible for research and development (R&D), plans to put more money into helping companies make the most of scientific research.

The DTI launched its new Technology Programme in April with a budget of £50 million for the first round of projects. In all, the government has allocated £150 million to the program over the next three years. The cash will support collaborative R&D projects and the creation of "Knowledge Transfer Networks."

The Technology Programme changes how the government of the United Kingdom supports R&D. It had previously concentrated on programs that supported small businesses or that brought together academic and industrial research groups.

The new approach is a response to an earlier DTI report on innovation, "Competing in the Global Economy: The Innovation Challenge," published at the end of 2003. At the launch of the Technology Programme, Lord David Sainsbury, Minister of Science, explained that this report contained the promise to "develop a technology strategy with a medium- to long-term perspective, which will provide a framework for setting policy priorities and improving the effectiveness of business support."

Sainsbury said, "In the past we have supported collaborative research and the transfer of new technology into industry, but it has largely been on an *ad hoc*, one-off [piecemeal] basis." As for the future, he said, "We will work closely with business to 'pull through' and exploit technologies from the U.K. and the international research base by providing some of the funding, and sharing some of the risk, in taking new technologies to the market."

Under the new arrangements, funding will cover 25–75% of R&D costs. Allocating funds is a two-step process, with a first round of general submissions followed by a second stage of more detailed proposals. The first call for proposals invited applications in the area of "advanced composite materials and structures," among other topics.

The DTI's first call resulted in 400 proposals for collaborative R&D projects, twice as many submissions as anticipated. About a quarter of the proposals

received went on to the next stage. Materials research was one of the more well-represented areas, with 25 collaborative R&D projects invited to submit full proposals.

Materials research may also feature in some of the other areas covered by the first call. The second stage invited full submissions for projects in bioprocessing (5 projects), electronics and displays (15), environmentally friendly transport (24), inter-enterprise computing (18), renewable technologies (28), and sensors and control systems (22).

Sainsbury revealed some of the reasons for choosing these subjects when he announced the program, saying that they represent "emerging technologies that have the widest and most pervasive applications in business and achieve environmental and social benefits."

The government's action is an attempt to persuade companies in the United Kingdom to invest more in R&D. When it comes to business R&D, Sainsbury said, "The U.K.'s performance is not good enough compared to our international competitors. The latest data of 2001 for business R&D shows the U.K. well behind the U.S. and near to the EU average."

As well as supporting collaborative research projects, the DTI said it will invest in knowledge transfer networks that set out "to improve the U.K.'s innovation performance by increasing the breadth and depth of knowledge transfer into U.K.-based businesses and accelerating the rate at which this process occurs."

Materials research is an early beneficiary of the new program. The first network funded under the new scheme is the National Composites Network. The DTI is putting £4.75 million into the network from the Technology Programme. Regional Development Agencies in the United Kingdom, increasingly powerful players in R&D strategy, will contribute a further £14 million. Industry's contribution will bring the total funding up to £30 million.

The National Composites Network will have various regional centers, each of which will specialize in particular technologies. The first part of the network will be an Advanced Composites Facility (ACF) at the GKN Centre on the Isle of Wight, focusing on automated manufacture. GKN Aerospace has pioneered the use of composites in aerospace. For example, the company is supplying the wing spars for the Airbus A400M, the first use of composites for such key structures in a large aircraft wing.

Phil Grainger, the group technical director at GKN, said, "The ACF will be truly

world-class—one of the most advanced facilities of its type in the world. It will develop design concepts, processes, and equipment to take manufacturing of complex composite components and assemblies to the next level of automation."

Patricia Hewitt, the government's trade and industry secretary, announced details of the new network in July at the Farnborough Air Show. "The U.K. is a world leader in research into composite materials," she said, "but we haven't exploited the technology as widely as we could. The Composites Network will be an invaluable tool for companies working across sectors, from aerospace to construction."

The United Kingdom's increased spending on technology and R&D is in line with the recent review of government spending, the Chancellor of the Exchequer's comprehensive spending review, announced in July (*MRS Bulletin*, July 2004, p. 440). The review provides additional funding for the DTI's technology strategy. Funding will increase by £140 million per annum by 2007–2008 which, when taken with the redirection of existing spending on innovation, will increase spending on the technology strategy, including the Technology Programme, to more than £250 million per annum by 2007–2008.

MICHAEL KENWARD

Research Council of Norway Announces Materials Foresight Program

A major "foresight" project on materials technology has been launched by the Research Council of Norway to put Norway's need for expertise in nano- and materials technology on the agenda. In the July announcement, the council said that Norway has not had a general research and development (R&D) strategy for materials technology or nanotechnology since the 1980s and is far behind the United States and the rest of Europe. In 2002, however, the council made nano- and materials technology a priority through the NANOMAT program.

"It's high time we take nano- and materials technology seriously," said Astrid Brenna, project manager of Advanced Materials Technology in Norway towards 2020. "We will focus on Norway's role as an innovative user and producer of materials, and we will highlight important areas of nanotechnology." The project is one of the three foresight programs recently undertaken by the council to enhance the expertise in what it determined are some of the most important future technologies. The other programs concern

information and communication technology and biotechnology.

Brenna said that innovations in materials are often a prerequisite for innovations in other areas such as medical, information, transportation, space, offshore, aquaculture, energy, and environmental and process technologies. "Materials technology is very important to the value creation of Norway in the future," Brenna said.

The project also focuses on how Norway's funding of R&D in materials technology can attain a balance between the new, highly advanced materials emerging from nanotechnology and the more traditional materials such as light metals, plastic, ferrous alloys, silicon, and wood.

During the project, several analyses will be carried out, describing the major challenges in the field of materials technology toward 2020. These analyses will form a knowledge base for the council's strategic work with materials and nanotechnology.

Australia Releases Energy Report

During a press conference in Canberra on June 15, Australia's prime minister, John Howard, announced the federal government's energy statement published in the white paper "Securing Australia's Energy Future."

"A centerpiece of this strategy," Howard said, "is the establishment of a low-emission technology fund. The government will provide \$500 million [AUD] to this fund, which in turn will leverage at least \$1 billion in private-sector investment to develop and demonstrate low-emission technologies."

According to the white paper, fossil fuel and renewable technologies eligible for the fund have the potential to lower Australia's emissions by at least 2% in the long term and will be commercially available by 2020–2030. Another \$100 million (AUD) will be provided to target strategic research, development, and commercialization of smaller-scale renewable-energy technologies. This latter decision is part of a government policy called Backing Australia's Ability: Building Our Future through Science and Innovation, released in May 2004, through which a further \$5.3 billion (AUD) will be provided for science and innovation over the

next seven years. According to the white paper, this amount represents the single largest investment in science and innovation in Australia's history.

The white paper calls for the provision of \$20 million (AUD) to support development of advanced electricity storage technologies, including batteries, electro-mechanical storage, and chemical storage.

With the announcement of the energy statement, David Brockway, the energy technology chief of the Commonwealth Scientific & Industrial Research Organisation (CSIRO), reaffirmed CSIRO's commitment to delivering quality research solutions for Australia's energy future.

Brockway said, "Across a number of divisions plus the newly established Energy Transformed National Research Flagship, CSIRO science aims to reduce the greenhouse-gas intensity of the Australian economy while continuing to protect Australia's competitive advantage from low-cost energy."

He said that CSIRO has a substantial program in place that includes research into:

- carbon dioxide separation and sequestration;
- fuel cells;
- production of hydrogen from fossil fuels;
- production of hydrogen from renewables, including water-splitting using photocatalysis, thermal processes, and renewable electrolysis;
- generation of renewable energy sources;
- advanced energy storage devices; and
- hybrid vehicles for energy-efficient transport.

CSIRO has also recently opened its Energy Centre at Newcastle, which is home to the Division of Energy Technology and the Energy Transformed Flagship Program. It will also be the site of the National Solar Energy Technology Centre, which CSIRO recently committed to establishing.

The white paper presents a commitment to continue participation in international collaborations such as the International Energy Agency, which addresses international energy technology and policy; the Carbon Sequestration Leadership Forum; and the International Partnership on the Hydrogen Economy. The government plans to review its international energy technology agreements by the end of this

year to strengthen Australia's contributions and ensure that the country's strategic interests are being met.

The white paper can be accessed online at www.dpmc.gov.au/energy_future/.

New Zealand and U.S. Consolidate Partnership on Climate Change

Six new projects were announced in Washington, D.C., in July under the New Zealand–United States bilateral climate change partnership. The announcement was made by Judy Lawrence, director of the New Zealand Climate Change Office, and Harlan Watson, U.S. senior climate negotiator and special representative.

The partnership, signed in July 2003, provides means for enhancing and accelerating collaboration and practical cooperation on climate change issues. Participants include researchers from government agencies and national laboratories, academia, and industry.

The projects announced in 2004 are:

- a study of global methane emissions,
- the rescue and digitization of historic climate data,
- work on carbon dioxide sequestration in coal seams,
- work to develop new materials for the hydrogen economy,
- work on nitrous oxide emissions from grazed pastures, and
- the hosting of a joint event with Australia to work with developing countries in the Pacific on climate observation.

"The announcement of these projects...underlines our continuing joint commitment to climate change," said Pete Hodgson, energy minister and convener of the Ministerial Group on Climate Change.

The New Zealand delegation to the United States, led by Lawrence, also included representatives from the National Institute for Water and Atmospheric Research (NIWA), Industrial Research Limited (IRL), CRL Energy Limited, and the Ministry of Foreign Affairs and Trade. The delegation met with senior officials from the U.S. Departments of State and Energy, the National Oceanic and Atmospheric Administration (NOAA), the National Science Foundation (NSF), the Consortium for Agricultural Soils Mitigation of Greenhouse Gases (CASMGs), and the Environmental Protection Agency. □

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