Tackling the major challenges facing society

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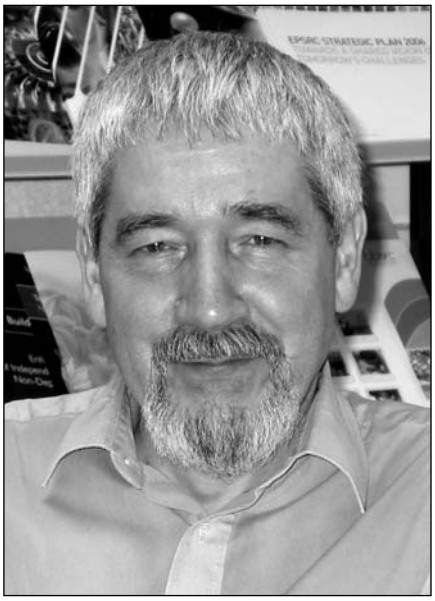

Addressing the 'big questions' has always been fundamental to science and engineering and now, more than ever, we need to find the answers. Securing sustainable energy supplies and halting the effects of climate change are global necessities. Harnessing the potential of new technologies, to develop innovative medical treatments or to enhance global security, will improve millions of lives across the world. As a society, and as a scientific community, we need to strive harder than ever before to develop and shape solutions – and that ambition underpins the Engineering and Physical Sciences Research Council's long term vision.

Scientific research has the potential to tackle the issues affecting all aspects of our lives – issues that are changing the climate of our planet and affecting the way in which our rubbish is collected, changing how we book our summer holiday and the security needed for a safe journey. With this potential comes responsibility, and our responsibility as a research council is to ensure the UK's scientists and engineers can tackle the challenges we face head on.

Aligning priorities

The Government's long term public policy challenges include the pressure on natural resources, demographic change and an ageing population, acceleration of innovation and technology requirements, and global uncertainty and the threat of terrorism.

To address these, working in collaboration with the academic community and the other Research Councils, we have developed four

EPSRC Priority Research Themes:

Energy - The mission of this on-going programme is to help the UK to meet its energy and environmental targets by supporting world class research to develop and exploit low carbon technologies and reduce energy use.

The programme encompasses power generation and supply, demand reduction, alternative energy vectors, transport and security of supply.

Digital Economy - a rapid response to developments in Information and Communication Technology (ICT) is vital to the future economic and social prosperity of the UK. The Digital Economy theme will link world-class ICT researchers with those in other scientific disciplines, business and other users to create a multidisciplinary, user-focused research base capable of responding to new opportunities.

The programme builds on a solid foundation: five previously funded IT-centric interdisciplinary research centres have already built a strong research base engaging social scientists, clinicians, psychologists, biologists, designers, artists and film makers.

Nanoscience, Through Engineering to Application - Nanoscience is a rapidly maturing field with the potential to revolutionise society. Harnessing the possibilities it creates could lead to environmental, healthcare and energy benefits, and major advances in materials, optics, and computing.

The theme will build on significant research and investment to create a coherent, directed programme taking basic research through to application.

An important element will be a public engagement programme to debate concerns, explore the ethical and social implications and clarify the benefits of nanotechnology.

Towards Next Generation Healthcare - This programme aims to improve the health of UK citizens at all stages of their lives and responds to the challenges and opportunities created by an ageing population. The programme will foster cross-discipline partnerships and industrial relationships including collaborations with major healthcare companies, the NHS, medical charities and the Medical Research Council.

This collaborative approach will not only enable world class research, but also accelerate the transition from basic research to clinical products, practices and patient benefits.

priority research themes; 'Energy', 'Digital Economy', 'Towards Next Generation Healthcare' and 'Nanoscience, Through Engineering to Application'. These priorities form a central strand of our Delivery Plan – a three-year framework that sets out our high level objectives and how we will achieve them. Each priority theme has a wide ranging remit and will require contributions from all scientific and engineering disciplines.

But identifying the issues will not, in isolation, lead to solutions. Our Delivery Plan also outlines our continued commitment to investing in talented people, maintaining and developing the UK's skills base and creating an environment and culture that fuels creativity, innovation and ambition.

Scientific ambition

Tackling major global issues requires a culture of ambition on the same scale. In fostering this, we will be encouraging the research community to develop proposals that will challenge current understanding and unlock doors to new scientific fields.

We will look to support longer, larger research programmes to give researchers the time, resources and facilities they need.

The issues facing society do not respect the boundaries of established scientific fields, geographical or political borders. More ambitious research is likely to include multidisciplinary teams working as part of multilateral international partnerships and a major component of the international policy of the Research Councils is, wherever possible, to break down barriers to such collaborations.

Accelerating benefit

Too much is made of a perceived conflict between fundamental and applied research – supporting high quality research and ensuring better impact from it are mutually compatible objectives. Fundamental breakthroughs, across the entire spectrum of scientific disciplines, fuel the innovative solutions and applications of tomorrow. Challenging established ideas remains at the heart of discovery and new thinking is essential to sustaining progress.

In generating world class research aligned to major societal and global issues, we must also ensure the potential of that research is realised. Working with the Technology Strategy Board, the Energy Technologies Institute and industrial and charitable partners, we will strive to accelerate the exploitation of research for both social and economic benefit.

We know the 'big questions' facing us will evolve and, as existing problems are solved, new ones will be posed. The key to continued success lies in maintaining a vibrant, creative and formidable UK research capability.

Our ten-year vision is for the UK to be as equally renowned for knowledge transfer and innovation as it is for research discovery. Meeting the commitments we have made in our three-year Delivery Plan will ensure we are on track to realise that vision.

For more information visit www.epsrc.ac.uk, or contact Jenny Whitehouse, Parliamentary Relations Manager: jenny.whitehouse@epsrc.ac.uk, 01793 442892.

Strategic partnerships

Building strategic partnerships with a range of organisations including industrial companies, charities and other research organisations will create increased funding opportunities and accelerate the exploitation of world-class research.

In the latest partnership, EPSRC and The Wellcome Trust have launched a joint £45m initiative to boost innovation in medical engineering.

Major advances in healthcare and life sciences research are frequently underpinned by the development of new technology, such as magnetic resonance imaging (MRI), reconstructive surgery and non-invasive diagnostic tests.

The initiative will provide funding for several multidisciplinary centres of excellence within the UK, bringing together experts in physical and engineering sciences with those in the clinical and life sciences.

This joint initiative will not only enable the development of new medical technologies, but also improve the integration of expertise in the public and private sectors so that innovations are harnessed effectively by the healthcare industry and aided through the process of regulation, commercialisation and distribution for patient benefit.

Investment in People

As part of its continued commitment to investing in skills and training, the Engineering and Physical Sciences Research Council has announced a £250m investment in new centres for doctoral training.

EPSRC is looking to establish at least 40 new centres to train the next generation of highly skilled and talented researchers capable of addressing the challenges of the 21st century.

The centres will support training across EPSRC's entire remit, including its priority research areas, and the investment will also provide a number of Industrial Doctorate Centres – with a greater focus on future careers in industry. The successful bids in this initiative are set to be announced in December 2008.