EDITORIAL

MAKING THE CASE FOR ENGINEERING

Dr Scott Steedman

The UK's engineering community needs a big vision to defend public investment in science and innovation. May's election of a Conservative government with an overall majority means that a Comprehensive Spending Review (CSR), the government's review of past and future spending of public money, is now expected to take place in the Autumn. Across Whitehall, departments are preparing to lift the lid on the last government's spending. One area widely expected to be subject to particular scrutiny is investment in science and innovation.

Last year, the Royal Academy of Engineering, in evidence to the Department of Business Innovation and Skills (BIS) for its December White Paper, *Our plan for growth: science and innovation*, argued strongly in favour of increasing investment in the 'eight great technologies', first highlighted in 2012 as a core part of the last government's Industrial Strategy. The government, with the research and innovation community, identified these technologies – robotics and autonomous systems, satellites, big data, synthetic biology, regenerative medicine, energy storage, advanced materials and agri-science – as "technologies in which the UK is

set to be a global leader".

This year's CSR is likely to challenge the value of continued public investment in these vital strategic initiatives. The engineering community needs to marshal the evidence and make the case again that the government must implement the science and innovation strategy fully if the early promise demonstrated in many of these areas is to deliver its potential for the UK.

Becoming a global leader in a technology is easier said than done. In Germany, there is a high level drive to define and shape a fourth 'industrial revolution', a programme known as Industrie 4.0. The federal government, industry, trade associations and the national standards body (DIN) have invested heavily in characterising what manufacturing might look like in the emerging digital economy and how to capture the jobs and production that will result.

Industrie 4.0 will enable skilled workers to oversee production of a wide range of bespoke products using networked, highly automated and versatile manufacturing plants. Information embedded in components will inform machines and people working on them how to assemble and test the products. Factories will be able to switch production on demand seamlessly from sector to sector. Industrie 4.0 will provide designers and innovators with manufacturing plants capable of making different things at once, in a system that will break down traditional industrial boundaries.

Industrie 4.0 is a grand vision. Using data and the internet to unlock the full potential of industrial automation would bring manufacturing back to its roots: local factories meeting local demand, a craft industry based on internet technology. Industrie 4.0 is a priority for German industry, government and academia seeking to

secure the country's position as a leading manufacturing nation in the digital age.

In the UK, under the last government, sector visions were forged into a national Industrial Strategy by which government and industry committed to work in partnership across 11 industrial sectors, with support for the development and commercialisation of the eight great technologies, plus initiatives in skills, finance and procurement. The Industrial Strategy has already made considerable progress, including multi-billion pound commitments by government and industry over the next five to ten years for the Aerospace Technology Institute, the Advanced Propulsion Centre and the Catapult programme, supporting the commercialisation of innovative ideas from business, industry and academia.

The Academy will argue that the new government must maintain these commitments. But it will take more than a case-by-case approach to innovation strategy to become a global leader in any of these eight technologies.

In the coming years, the digital economy will sweep through established industries. The ubiquitous nature of information will challenge traditional business models, with data the universal currency for demonstrating performance.

Just as Germany has focused on defining and delivering Industrie 4.0, so the UK engineering community needs to determine its place in a global digital economy. Making the case for engineering in this CSR needs a big vision of the global opportunity if the UK is to develop and sustain cross-sector technological leadership in the digital age.

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