

Executive summary

Engineering is at the core of our modern society, underpinning every sector from communication and entertainment to finance and healthcare, as well as its more visible applications in construction, manufacturing, energy, defence and transport.

Engineering turns research into wealth, improving lives and driving economic and social progress. Engineering-related sectors contribute at least £280 billion in gross value added to the UK economy – 20% of the total. In comparison, UK public sector investment in engineering R&D was £1.5–3.1 billion. It is therefore critical that in negotiating the UK's exit from the EU, and in the trade negotiations that will follow, government is fully conversant with the key issues that affect the UK's engineering performance.

The process of the UK leaving the EU will certainly present challenges but it is also an opportunity to reinforce the UK's position as a leading nation of global influence in terms of trade, knowledge and innovation. Engineering, with its world-class talent, universities, companies and facilities, will be at the heart of delivering renewed prosperity to the UK through close partnership with government. With the right climate and conditions, engineering will be in a strong position to make an even greater contribution to the UK.

The 38 professional engineering organisations, representing all disciplines of UK engineering, have joined forces under the leadership of the Royal Academy of Engineering to provide evidence-based advice to government on the opportunities and risks associated with leaving the EU. The objective is to support government in securing from the negotiations the best possible outcome for the UK, with job creation and economic prosperity foremost in our considerations. This report represents the first phase of evidence gathering and emerging findings in what will be an ongoing dialogue with government.

For ease of understanding of a complex and broad subject, we have grouped our report into three themes: people and skills, finance and markets, and standards and legislation.

Three overarching points emerged most strongly from our consultation:

- The UK engineering community is committed to building on its international reputation to make the most of global opportunities in research, trade and investment. The UK must continue to be welcoming and open for business.
- Government needs to continue to engage with leaders and opinion formers throughout industry and academia to create a shared vision for the UK in the world, building confidence and managing the inevitable uncertainty brought about by the referendum result.
- A new industrial strategy, based on strong partnerships between industry, academia and government, will be key to maximising opportunities for wealth creation and to

enable engineering to contribute effectively to economic development and social progress (see Box 3).

People and skills

Engineering success is based on people – the best and brightest at all levels – and the UK has a world-class research base and world-renowned engineers across all sectors. However, the UK is already experiencing a serious engineering skills crisis and the impact on this of leaving the EU needs to be carefully managed.

Government and the engineering community must:

- seize the opportunity to use the combination of leaving the EU and the commitment to a new industrial strategy to take decisive action on the UK's engineering skills crisis
- work with industry to identify the gaps in essential skilled engineering occupations that cannot be filled domestically in the short term and develop straightforward and cost-effective solutions.

In negotiating the UK's exit from the EU, government should aim to:

- maintain ease of intra-company transfers, recognising that many companies require their engineers to move freely to support and fulfil contracts
- ensure that talented students, academics and practising engineers have certainty about the opportunities to study and work in the UK
- enhance support to enable UK students, academics and practising engineers to gain international experience including in the EU.

Finance and markets

UK engineering already competes successfully in the global marketplace. It has the talent and reputation needed to grow even stronger in world markets if given the right conditions and support. The new industrial strategy should provide the perfect framework to enable UK industry and innovation to prosper and the UK engineering community is eager to partner with government to help shape the conditions needed for this to happen.

In general, to support investor confidence, the government will need to:

- state a clear direction that includes a policy framework for both tariff and non-tariff barriers
- create the conditions for the UK to continue to attract a high level of foreign direct investment (FDI) by ensuring that the

costs, regulatory frameworks and future international trade deals make the UK an attractive place to do business.

During negotiations with the EU, the government should aim to:

- continue membership of the Energy Community and alignment with the Digital Single Market
- mitigate the impact of the potential loss of European Investment Bank loans for UK infrastructure projects and provide possible alternative sources of low-cost finance
- maintain data protection and cybersecurity policies equivalent to those of the EU to avoid barriers to trade.

In terms of funding, government needs to:

- seek the closest achievable association with EU research and innovation programmes and ensure that, if needed, long-term UK funding programmes are available that complement current UK funding streams. These should focus on supporting international mobility and collaboration, including academic and industry partnerships
- recognise that European funding streams and collaboration frameworks provide crucial sources of innovation support for UK businesses, of all sizes, that will need to be replaced if no longer available
- consider the impact on funding streams for regional development and the devolved nations and identify a future system that will deliver effective, targeted regional development and support.

- a review of public procurement and state aid rules as part of the industrial strategy to remove complexity and enable a much more productive partnership between government, academia and industry.

It will be important to retain as much influence as possible on setting standards and legislation. In particular, it is important for government to:

- support UK national standards bodies in continuing to exert influence on setting standards through membership of European Standards Organisations and maintain the UK's commitment to the 'single standard model'
- maintain and encourage the participation of UK people and organisations on expert groups that advise on EU policy and legislation.

Standards and legislation

The UK has always played a leading role in shaping the standards and legislation behind the EU's single market and UK engineering has invested heavily in the setting of industry standards that define our products and services. It is vital that this level of influence is maintained and built upon.

In terms of trade negotiations, the government should aim to:

- avoid, as far as possible, barriers or dual regulatory burdens that would increase costs for UK business and make the UK a less attractive trading partner.

The issue of Regulations, Directives and other EU law applicable in the UK will initially be dealt with by what the Prime Minister has called the 'Great Repeal Bill'. The details of the Bill are still to be determined but consideration will need to be given to:

- avoiding, as far as possible, divergence from EU legislation that would discourage trade and investment, lose consumer safeguards and raise costs for the consumer
- identifying those areas where the loss of or divergence from EU legislation might cause legal complications either at a national or devolved level