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<u>The Foundation for Science & Technology – A debate on the House of</u> <u>Commons Select Committee Inquiry into Engineering</u>

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My Lords, Ladies and Gentlemen

The past twelve months have been good for engineering – whilst turbulent for the world economy.

As a result, the value of a diverse economy has never been more obvious. Recognition of the part played by engineering has revived and flourished.

Phil Willis and his committee deserve our thanks for their diligence and their recommendations. Their report has played an important role in raising awareness and promoting change. The inquiry has also helped the engineering profession to come together. Many eminent engineers contributed and I certainly appreciate the outcome.

But even as the committee was going about its business, admissions to most engineering courses in UK universities were rising significantly – up to 15% in the case of civil engineering.

And the value of an engineering degree remains appreciated well beyond the profession – not least for the systems approach which can be applied in the City as much as in engineering design. Nonetheless, 89% of employed engineering and technology graduates still go into engineering roles.

Signals of success are important motivators. Let me highlight three examples:

<u>First</u>, the UK today owes about 13% of its GDP to manufacturing, down from 31% in 1977 - but the whole nature of business and industry, and what is measured as manufacturing, has changed in that time.

The actual value of UK manufacturing output has continued to rise as the sector has changed, so despite the shockwaves of recession, the underlying strengths of the sector are firm.

In terms of "value added", UK manufacturing still lies 6th in the world rankings just behind Italy and ahead of France and it is two and a half times as big as it was fifty years ago. Because we have concentrated on high-technology and high-value engineering as traditional heavy industries have declined.

Second, engineering has never been confined to heavy industry – though that is a common perception. It has always underpinned construction. But it also pervades sectors as diverse as aerospace and defence, electronic and electrical equipment, biotech and telecoms; as well as leisure and media.

There are few companies listed in the FTSE 100 index that do not rely on engineering in some form. As this audience knows, the TESCO Clubcard owes as much to engineering thinking and software as it does to business innovation.

And my old employer, BP, owes as much to engineering as geology. Drilling an oil well today would be like serving a tennis ball from St. Paul's, landing it in the service area of Centre Court and then travelling in a straight line for another mile or so. That's extraordinarily integrated engineering.

<u>Third</u>, the UK remains strong in important areas.

- The iconic Watercube in Beijing, shown on televisions around the world during the Olympics, was designed by Arup, a global company based in London.
- About a third of the total value of the ground-breaking Airbus A380 is contributed by the UK via its wings and engines. The UK accounts for over 13% of total global turnover in aerospace.
- And the UK Defence and security industry punches well above its weight with a 30% share of the global market.

At the individual level, the UK competes strongly in the new industries and wins on a global basis. Mike Lynch, founder not so long ago of Autonomy Corporation – now a FTSE 100 company – showed what could be done.

I draw four conclusions from this overview:

<u>First</u>, Engineering in the UK is in good health, providing a firm base for going forward.

<u>Second</u>, I agree with the Committee's view that UK engineering is seen as an exemplar around the world, even in countries like Japan and China. We have intellectual credit where it matters.

<u>**Third**</u>, this world-wide reputation makes the UK an attractive place for global companies to do their R&D. Microsoft in Cambridge. Sharp in Oxford. And so on.

<u>And finally</u>, I am not advocating that any economy should look to engineering alone as its bedrock. Diversity is the key.

I want to turn now to two words loaded with baggage – 'Engineering' and 'Science'.

I am not here to argue for one or the other.

The Committee's inquiry was into 'Engineering', not 'Science'. But from my perspective, both are essential parts of an innovation spectrum.

To my mind, engineering has two faces, much like Janus.

One faces the sciences, the other faces commerce and finance. Engineering understands both and translates between the two.

It deploys the fruits of science in creating the products and services with which commerce can create wealth. At the same time it translates the needs of commerce into research opportunities.

Engineers, in short, are concerned with "practice". Engineering is about solving the world's great challenges of the 21st century:

- Providing practical solutions to climate change and energy needs;
- Providing infrastructure of many kinds to defeat the underlying causes of poverty;
- And aiding improvements to health and well-being.

Lord Darzi, Health Minister and Honorary Fellow of the Academy, is himself an ardent enthusiast for what engineering can do for medicine. This helped him become a world leader in micro-surgery.

[Engineering in Government]

A great contribution from the IUSS committee inquiry is its recommendation that Government has much to gain by closer collaboration with engineering.

Engineers are taught to think in terms of systems, to be pragmatic, to think of delivery in the real world. They also understand project management.

Those skills are needed in Government now as never before, as the committee and Government acknowledge.

The Academy, together with the engineering institutions, now has a close working relationship with John Beddington and his team of Departmental Chief Scientific Advisors.

As an engineering community, we are now helping to provide expert advice on topics as diverse as critical infrastructure resilience and global water security.

And looking forward, we expect to be bringing this engineering flavour of policy advice to an ever increasing range policies and Government objectives.

I take it as a huge vote of confidence that the engineering community was asked to contribute to the Severn Tidal Power study at an early stage and are now providing valuable advice on what could lead to a £20Bn plus project. This is probably the largest engineering project the UK will have ever seen.

Good scientific advice does not exist in a vacuum and neither does engineering advice. Good policy needs both and should not pay too much attention to the boundaries between them. They are complementary.

[The Profession]

The IUSS Committee report recognises the breadth and diversity of the engineering profession. Our rich history has left us the legacy of 36 professional engineering institutions, all providing for separate constituencies - similar to many other professions with a long history.

There have been calls for rationalisation and if we were starting with a clean slate we almost certainly would not structure the profession as it is now.

However, I see no profit in pursuing that course in the short term. I am glad that the report accepts the shape of the profession we currently have.

What is far more important is that we work together, speaking with a unified voice, providing a coherent source of advice to Government and the public.

The Academy fully accepts the Committee's recommendation that it should take forward and formalise its leadership role, so that the community can communicate – and coordinate – more effectively.

This unified voice of engineering is important to our ability to help Government in its policy development and deployment, but is critical to our relationship with society in general. I set out a case when I began for engineering being in good shape in the UK. As we move forward as a country and expect engineering to contribute more, both in terms of value added and contribution to GDP, we will need more and better engineers coming though the development pipe line.

Our joint, coordinated public facing activities are critical to ensuring that today's young people – tomorrow's engineers – are enthused about the possibilities of engineering. Only our unified voice can stop them being confused and being put-off engineering as a rewarding career.

[pause]

Ladies and Gentlemen, forty years ago, man landed on the moon. This was a great engineering feat.

It offered up new opportunities and created new industries. But ultimately President Kennedy's decision to support the programme was as much an act of faith as it was of cool analysis.

Today there are great opportunities for engineering to play a part in a UK and global economic recovery – not least in opening up in the low-carbon space. The base already exists in this country. A low-carbon revolution, especially in the waters off our coasts, is a prize to be won. It is time for the government, UK businesses and engineering to work together on reaching this goal.

It is that important – our economic future and general wellbeing will gain hugely from us all moving forward from this excellent report and getting on with doing what it recommends.

Thank you.