The Foundation for Science and Technology
Debate Record Note

Delivering the UK Industrial Strategy: the importance of place

Date and Location: 19th December, 2018 at The Royal Society

Chair:	The Rt Hon. the Lord Willetts FRS Chair, The Foundation for Science and Technology
Speakers:	Ken Skates AM Minister for Economy and Transport, Welsh Government Sir Mark Walport FRS FMedSci HonFRSE Chief Executive, UK Research and Innovation (UKRI) The Rt Hon Greg Clark MP Secretary of State for Business, Energy and Industrial Strategy,
Respondents:	Katherine Bennett OBE FRAeS, Senior Vice-President, Airbus Dr Julia Sutcliffe FRAeS, Chief Technologist and Head of Engineering Strategy, Global Air Sector, BAE Systems
Sponsors:	Airbus, the ERA Foundation, the Knowledge Transfer Network, The IET, Rolls-Royce, the Royal Academy of Engineering, the Royal Society of Biology, the Society of Maritime Industries, SPTS Technologies Ltd and the Chief Scientific Adviser's office of the Welsh Government
Audio Files:	www.foundation.org.uk
Hash tag:	#fstindustrialstrategy

LORD WILLETTS opened the meeting by saying that he was privileged to follow the Earl of Selborne as chair of the Foundation. He also paid tribute to Dougal Goodman, who was retiring as Chief Executive, and welcomed Gavin Costigan as his successor.

KEN SKATES said that visiting the Royal Society reminded him of the awe-inspiring achievements of many Welsh scientists. Wales was already the home of some of the most innovative economic development in the world, and the Welsh Government's Economic Action Plan, launched a year ago, had placed research, innovation and skills at its heart. The Plan's vision was of inclusive growth. There were clear synergies with the UK's Industrial Strategy and, despite political differences, he was strongly committed to working with the UK Government, and particularly the Secretary of State here today, in order to sustain Wales and its economy.

The sound foundation for this work was the strength of the research base, and there was a need to continue to invest strategically in research and innovation in Wales. Since 2012 the Welsh Government had established a partnership to do this, and investment of now up to £100 million had attracted research professors to Wales from many countries. Though Wales secured just 2% of the UK's total R&D expenditure, much research in Wales was world-leading or internationally excellent. Clusters in Wales, together with the South West of England, had significant strengths in Artificial Intelligence and Digital, Clean Growth and Advanced Manufacturing. There were however some vulnerabilities, in that 75-85% of Wales's total EU funding for research and innovation came from EU Structural Funds rather than Horizon 2020, and its productivity lagged behind that of London and the South East. It was therefore right that 'place' was one of five foundations of

productivity improvement in the Industrial Strategy.

He hoped that the new UK wide "Shared Prosperity Fund" would respect the devolution mandate. Professor Graeme Reid's recent review[1] had highlighted that the research base in Wales did not currently have the scale to deliver its full potential. The level of competitively won Innovate UK funding had been rising pleasingly in recent years. The Compound Semiconductor Catapult award of £50 million over five years would see the first Catapult headquartered in Wales. Since 2016 there had been 36 successful projects from Wales in the Industrial Strategy Challenge Fund.

The Welsh Government would be working more closely in future with innovation businesses, research bodies and key UK Government contacts. Partnership was even more critical to success in these uncertain times.

SIR MARK WALPORT said that place really mattered, but research and innovation should only be funded where it would be successful. Some research and innovation, such as astronomy, had to be done in a few places with the right conditions, but there were examples right across the UK where strong science was being done, including in locations where the economy faced greater challenges. Critical mass also mattered, and success depended often on access to a broad base of excellent skills. The dominance of London and the South East in UK research and innovation had generated a greater gap with other regions than in most OECD comparators.

Successful investment in place required four elements: academic strength, business strength, local government support and good leadership. The Whitty report in 2013 on clusters had shown that universities had extraordinary potential to enhance growth, but this needed skilled people, the retention of these people and local attractors ("stickiness"). Outstanding leaders of research and innovation transcended the boundaries which otherwise created barriers to success. To succeed the Industrial Strategy had to leverage private sector investment in research and innovation. 80% of the UK economy was now in the service sector, and this tended not to utilise R&D in its traditional forms, so fresh thinking was required, as had been shown in the creative sector.

Regional Science & Innovation audits had been helpful in identifying regional strengths, which could benefit under UKRI's Strength in Places Fund. Universities, research establishments and businesses needed to be aligned, particularly to secure appropriate skills. The quality of local transport, housing and education all mattered for successful investments in place.

THE RT HON GREG CLARK said that UKRI had already done fantastic work, and he was delighted to be collaborating with the Welsh Government on the Industrial Strategy. As long as two centuries ago, George Stephenson from his home region of the North East had encountered scepticism in London about regional strengths in innovation. For too long this had continued, and he was delighted to pay tribute to the fantastic scientists who came from all over the UK. All his time in Government he had used his position to promote devolution from Westminster to the regions.

The UK Government's Industrial Strategy, launched in November 2017, had introduced a greater sense of unity and common purpose across the UK, but did not involve the Government in London telling regions what they were good at. The four Grand Challenges in the Strategy resonated in many respects with the Welsh Government's Plan. Through big increases in R&D funding the Government would be fostering new technologies. At Imperial College he had launched the £1 billion artificial intelligence sector deal. He did not want to discount the contribution which London and the South East made to research and innovation; this was the sort of problem any other country would love to have.

The Grand Challenges offered many opportunities right across the UK, from small satellite manufacture to a spaceport in Sutherland. Wales had great opportunities to contribute, for example on clean energy and the decarbonisation of buildings. The new aerospace sector deal included funding demonstrator hybrid electric propulsion, and would support 70 smaller aerospace firms across the UK, particularly in Wales and the South West. Although there were currently 15,000 Britons aged over 100, some 10 million people in Britain alive today could expect to live until they were 100. The fourth Grand Challenge on ageing was based on providing a test bed for products which would enable people to have five extra years of healthy independent living by 2035.

He was thrilled that the Foundation had chosen this topic. He hoped that the local Industrial Strategies to be put in place by March 2019 would earn that month a place in history!

1 Reid Review: Government-funded research and innovation in Wales https://gov.wales/newsroom/science-and-technology/2018/180606-plans-to-grow-welsh-research-published-in-reid-review/?lang=en

KATHERINE BENNETT said that her involvement in the Local Enterprise Partnership in Bristol had shown her at first hand the strength of research and innovation outside the South East. It was great that the Industrial Strategy Challenge Fund was oversubscribed, and the Aerospace Growth Partnership was busy setting out the priorities for the sector. Businesses had a key role in the place agenda. Businesses followed other strong businesses in choosing locations. To encourage diversity, digital skills provision would be very important. In digital skills, businesses had so much to gain and learn from the young.

JULIA SUTCLIFFE said that effective public/private sector collaboration was essential to establishing a successful Industrial Strategy. The defence sector needed to deploy dual use technology more extensively to bring down lead times, particularly of bespoke systems. For investments in place to work, excellent health and education provision was essential to attract skilled staff. On skills, particular attention should be given to utilising the young unemployed. On innovation, frictionless trade was vital for SMEs. The alignment of BAE Systems with the Williams Formula One team should lead to important national technology demonstrators.

DISCUSSION The subsequent discussion started with a welcome that discussion of the Industrial Strategy could transcend political boundaries. Nevertheless, annual spending per head on R&D was £112 in the East of England but only £62 in the North East, so the agenda of place had to be addressed. However, for investments in place to be successful they needed to combine the four elements described above. The experiments a decade ago of regional support had led to investments in nanotechnology centres in every region, and most of these had failed. Those responsible for Government funding had to maximise the success achieved from public resources.

Discussion of the Industrial Strategy must include sufficient provision of technicians. Currently these were hard to hire in some sectors. In aerospace and medical research there had been successful initiatives on technician training, which had brought together larger and smaller employers. Deepening supply chain relationships also brought other benefits, in terms of achieving sufficient specialisation and complexity to compete internationally.

Understanding of the Industrial Strategy was limited outside politics and London. How could the Government communicate what it was all about more effectively? On the other hand, perhaps what was more important in the regions was understanding of what benefits the Industrial Strategy could bring, rather than knowledge of the policy itself.

Greater coherence, or even unity, amongst the many public bodies in Yorkshire involved in contributing to the Industrial Strategy would be highly desirable. However, this had to be the result of regional initiative, rather than imposed nationally.

The food and drink sector had not been mentioned by the speakers, although it was the UK's largest manufacturing sector. There was useful learning from the Netherlands about productivity in agriculture. Defra had published a strategy on waste the day before , and food waste raised important challenges. Food and drink was one of four priority sectors in the foundation economy in Wales. A food and drink sector deal was being negotiated across the UK.

Innovation was needed to reduce regulatory burdens, particularly for SMEs. This often required a focus on regulatory burdens across all partners in a sector to succeed. A regulatory innovation fund had encouraged regulators to become more innovative.

The Government had just published new proposals on migration. Although a salary cap of a minimum of £30,000 was not a firm proposal, to some sectors this looked too high if significant economic problems were to be avoided. Given the substantial disparities in income between regions, a regional migration policy might be needed.

Under the Government's target of spending 2.4% of GDP on R&D by 2027, two thirds of the funding would haved to come from the private sector. Businesses chose largely to locate in regions with the best growth prospects and highest productivity. Given the relatively better performance of London and the South East, in these respects it was hard to see the economic case for business of a substantial rebalancing of their spending away from this area. Nevertheless, there were areas of strong skills capability widely across the UK, and these should attract business, if the other factors of good education, health services and culture were also available.

There had been substantial changes in the public bodies charged with the place agenda over the last two decades, so there was a significant challenge in this aspect of the Industrial Strategy proceeding seamlessly after changes of Government in the years ahead. Nevertheless, the degree of cross party consensus in this debate was a welcome sign.

John Neilson

Useful reading:

The Industrial Strategy - forging our future
www.gov.uk/government/speeches/the-industrial-strategy-forging-our-future

Industrial Strategy: the 5 foundations
www.gov.uk/government/publications/industrial-strategy-the-foundations/industrial-strategy-the-5-foundations

Prosperity for All: economic action plan, Welsh Government
www.gov.wales/topics/businessandeconomy/economic-action-plan/?lang=en

Reid Review: Government-funded research and innovation in Wales
https://gov.wales/newsroom/science-and-technology/2018/180606-plans-to-grow-welsh-research-published-in-reid-review/?lang=en

UK Research and Innovation(UKRI)
www.ukri.org

Arts and Humanities Research Council, UKRI
www.ahrc.ukri.org

Biotechnology and Biological Sciences Research Council, UKRI
www.bbsrc.ukri.org

Economic and Social Research Council, UKRI
www.esrc.ukri.org

Engineering and Physical Sciences Research Council, UKRI
www.epsrc.ukri.org

Innovate UK, UKRI
www.gov.uk/government/organisations/innovate-uk

Medical Research Council, UKRI
www.mrc.ukri.org

Natural Environment Research Council, UKRI
www.nerc.ukri.org

Research England, UKRI
www.re.ukri.org

Science and Technology Facilities Council, UKRI
www.stfc.ukri.org

Companies, Research Organisations and Academies:

Airbus
www.airbus.com

Association of Innovation, Research and Technology Organisations (AIRTO)
www.airto.co.uk

Association of the British Pharmaceutical Industry
www.abpi.org.uk

AstraZeneca
www.astrazeneca.co.uk

BAE Systems
www.baesystems.com

British Academy
www.britac.ac.uk

Catapult Programme
www.catapult.org.uk

Department for Business, Energy and Industrial Strategy
www.gov.uk/government/organisations/department-for-business-energy-and-industrial-strategy

Department for Education
www.gov.uk/government/organisations/department-for-education

Engineering Council institution awarding bodies:

BCS, The Chartered Institute for IT
www.bcs.org

British Institute of Non-Destructive Testing (BINDT)
www.bindt.org

Chartered Institution of Building Services Engineers (CIBSE)
ww.cibse.org

Chartered Institution of Highways & Transportation (CIHT)
www.ciht.org.uk

Chartered Institute of Plumbing and Heating Engineering (CIPHE)
www.ciphe.org.uk

Chartered Institution of Water and Environmental Management (CIWEM)
www.ciwem.org

Energy Institute (EI)
www.energyinst.org/home

Institution of Agricultural Engineers (IAgrE)
www.iagre.org

Institution of Civil Engineers (ICE)
www.ice.org.uk

Institution of Chemical Engineers (IChemE)
www.icheme.org

Institute of Cast Metals Engineers (ICME) - licence suspended on 20 April 2018
www.icme.org.uk

Institution of Engineering Designers (IED)
www.ied.org.uk

Institution of Engineering and Technology (IET)
www.theiet.org

Institution of Fire Engineers (IFE)
www.ife.org.uk

Institution of Gas Engineers and Managers (IGEM)
www.igem.org.uk

Institute of Highway Engineers (IHE)
http://www.theihe.org/

Institute of Healthcare Engineering and Estate Management (IHEEM)
http://www.iheem.org.uk/

Institution of Lighting Professionals (ILP)
http://www.theilp.org.uk/

Institute of Marine Engineering, Science & Technology (IMarEST)
http://www.imarest.org/

Institution of Mechanical Engineers (IMechE)
http://www.imeche.org/

Institute of Measurement and Control (InstMC)
http://www.instmc.org/

Institution of Royal Engineers (InstRE)
http://www.instre.org/

Institute of Acoustics (IOA)
http://www.ioa.org.uk/

Institute of Materials, Minerals and Mining (IOM3)
http://www.iom3.org/

Institute of Physics (IOP)
http://www.iop.org/

Institute of Physics and Engineering in Medicine (IPEM)
http://www.ipem.ac.uk/

Institution of Railway Signal Engineers (IRSE)
http://www.irse.org/

Institution of Structural Engineers (IStructE)
http://www.istructe.org/

Institute of Water
http://www.instituteofwater.org.uk/

Nuclear Institute (NI)
http://www.nuclearinst.com/

Royal Aeronautical Society (RAeS)
http://www.aerosociety.com/

Royal Institution of Naval Architects (RINA)
http://www.rina.org.uk/

Society of Environmental Engineers (SEE)
www.environmental.org.uk

The Society of Operations Engineers (SOE)
www.soe.org.uk

The Welding Institute
www.theweldinginstitute.com

ERA Foundation
www.erafoundation.org

Francis Crick Institute
www.crick.ac.uk

Government Office for Science
www.gov.uk/government/organisations/government-office-for-science

GSK
www.gsk.com

Knowledge Transfer Network
www.ktn-uk.co.uk

Learned Society of Wales
www.learnedsociety.wales

Lloyd's of London
www.lloyds.com

Lloyd's Register Foundation
www.lrfoundation.org.uk

NESTA
www.nesta.org.uk

Office for National Statistics
www.ons.gov.uk

Rolls-Royce
www.rolls-royce.com

Royal Academy of Engineering
www.raeng.org.uk

The Royal Society
www.royalsociety.org

The Royal Society of Biology
www.rsb.org.uk

The Royal Society of Chemistry
www.rsc.org

The Royal Society of Edinburgh
www.rse.org.uk

Society of Maritime Industries
www.maritimeindustries.org

SPTS Technologies
www.orbotech.com/spts

The Alan Turing Institute
www.turing.ac.uk

UK Statistics Authority
www.statisticsauthority.gov.uk

Wellcome Trust
www.wellcome.ac.uk

Welsh Government
www.gov.wales

Universities:

University of Cambridge
www.cam.ac.uk

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