The Industrial Strategy - Making it work for you!
Welcome Address
Professor Jerry Roberts
Deputy Vice-Chancellor Research & Enterprise
The Industrial Strategy Challenge Fund

Anna Mereu
Senior Project Manager – Industrial Strategy Challenge Fund

Plymouth – 26th of January 2018
Overview

1. Industrial Strategy & “the money”
2. First wave of challenges
3. Latest challenges announced
4. Next steps
Creating an economy that boosts productivity and earning power throughout the UK.

5 foundations of productivity:

- **Ideas**
  - the world’s most innovative economy

- **People**
  - good jobs and greater earning power for all

- **Infrastructure**
  - a major upgrade to the UK’s infrastructure

- **Business environment**
  - the best place to start and grow a business

- **Places**
  - prosperous communities across the UK

Delivered by Innovate UK
£31bn National Productivity Investment Fund (NPIF) increased in Autumn Budget 2017

- £7bn R&D Funding (over four years to FY21/22)
- Industrial Strategy Challenge Fund (£TBC over four years to FY21/22)
- Innovation, Applied Science & Research (£TBC over four years to FY21/22)
NPIF Skills

- **£250M** over the next four years to continue to build the pipeline of high-skilled research talent
  - Including **£30m** for Knowledge Transfer Partnerships

- **1,000 PhD** places and support for new fellowships for early and mid-career researchers aligned to the Industrial Strategy

- Supplemented with targeted investment to attract global talent from overseas to the UK, helping to maintain the UK’s position as a world-leader in science and research
  - **Ernest Rutherford Fund** – supporting fellowships from early-career and senior researchers from the developed world and from emerging research powerhouses such as India, China, Brazil and Mexico
Industrial Strategy Challenge Fund

- Builds on the UK’s world-class research base and delivers the science that business needs to transform existing industries and create new ones
- Accelerates commercial exploitation of the most exciting technologies the UK has to offer the world to ensure that scientific investment truly delivers economic impact, jobs and growth right across the country
- Programmes delivered by the fund will be industry-led and powered by multi-disciplinary research and business-academic collaboration
- Delivered by Innovate UK and Research Councils UK, and eventually UK Research and Innovation, the single voice for the UK’s research and innovation landscape
Industrial Strategy Grand Challenges

AI and Data Economy

Healthy ageing

Clean growth

Future of mobility
First wave of challenges
ISCF Wave 1 Challenges (1 of 3)

- Medicines manufacturing technologies
- Robots for a safer world
- Batteries for clean and flexible energy storage
- Self-driving vehicles
- Manufacturing and materials of the future
- Satellites and space technology
£181M to develop first-of-a-kind technologies for the manufacture of medicines to accelerate patient access to new drugs and treatments

£246m to develop world leading batteries, designed and manufactured in the UK, to fully exploit the industrial opportunity of vehicle electrification

£93m to develop AI and Robotic systems that can be deployed in extreme environments such as occur in offshore energy, nuclear energy, space and deep mining
£38M to develop the AI and control systems need to drive vehicles autonomously through complex environments

£26M to develop the next generation of affordable light-weight composite materials for use in aerospace applications

£99M to develop next generation launch technologies and manufacturing and testing capabilities that will allow the UK to construct satellites and deliver payloads into orbit
Example of awards to date

• On the 8th of November: announcement of the ISCF Robotics and AI awards:
  • £16.5 million will be shared between 70 businesses, 13 universities and 10 research organisations for collaborative research and development projects.
  • A further £3 million will go to 17 demonstrator feasibility studies.

• A £44.5 million investment will be made into 4 research hubs for world-leading research and robotic solutions.

The projects will each support the research and development of robotics and artificial intelligence (AI) technologies for use in industries such as offshore and nuclear energy, space and deep mining.
Example of awards to date

• On the 22nd of January: announcement of the ISCF Medicines Manufacturing awards:
  • £21 million for Advanced Therapies Treatment Centres
  • £15 million for Medicines Manufacturing collaborative research and development round 1 competition
  • £8 million for Digital Health Catalyst round 1
  • £5.6 million for Viral vector production for Cell and Gene Therapy
  • £8 million for Digital Health Technology Catalyst round 2 - funding competition opens 15 February 2018
  • £10 million for the Medicines Manufacturing challenge round 2 - funding opens 12 March 2018
Latest challenges

£725m funding announced on the 27th of November
The next wave of the Challenge Fund

Transforming construction
Energy revolution

Data to early diagnosis & precision medicine
Healthy ageing

Transforming food production
Audience of the future

Next generation services
Quantum technology

Delivered by
Innovate UK
How the ISCF challenges fit with the Industrial Strategy Grand Challenges

Clean growth
- Energy revolution
- Transforming construction
- Transforming food production

Healthy ageing
- Medicines manufacturing
- Data to early diagnosis and precision medicine
  - Healthy ageing

Future of mobility
- Faraday battery challenge
- Extreme robotics
- National space test facility

Artificial intelligence and data economy

Audience of the future / Next generation services (pioneer) / Quantum technology (pioneer)
Data to early diagnosis and precision medicine –

The challenge is to combine the wealth of data created by UK researchers with real world evidence from our health service. That will allow industry to create new products and services that will diagnose diseases earlier and help clinicians choose the best treatment for individual patients. This will save lives and set the UK at the forefront of a growing global market in diagnostics worth $217bn in 2016.
Healthy Ageing

The challenge is to develop new products and services that offer choice, meet their aspirations and through better, more effective care, support an independent lifestyle as they age. By working together, the government and industry can address the challenges of ageing whilst capturing a growing global market.
Transforming food production: from farm to fork

The challenge is that our food needs to be much more efficient and sustainable. By using precision technologies we can make that a reality: transform food production while reducing emissions, pollution, waste, and soil erosion. By putting the UK at the forefront of this global revolution in farming, we will delivering benefits to farmers, the environment and consumers while driving growth, jobs and exports.
Pioneer funding for Quantum

A new set of products from medical devices to sensors and safer communication systems may be possible using the emerging physical science known as quantum technology. The potential is huge but still largely in the lab environment. Pioneer funding will bring new disruptive companies together with existing businesses to understand how this emerging technology can be turned into products that will underpin industry in the future.
Next Generation Services

Pioneer funding will help service industries to identify how application of artificial intelligence and data analytics can transform their operations. This will help to set UK service industries at the forefront of developing and using innovation.
Audience of the future

The challenge is to bring creative companies, researchers and technologists together to create striking new experiences that are accessible to the general public. This can create the next generation products, services and experiences that will capture the world’s attention and position the UK as the global leader in immersive technologies.
Prospering from the energy revolution

For the majority of our energy to be clean and affordable, we need much more intelligent systems. Smart systems can link energy supply, storage and use, and join up power, heating and transport – to dramatically increase efficiency. By developing these world-leading systems in the UK, we can cut bills while creating high value jobs for the future.
Transforming construction
(up to £170m)

The challenge is to transform construction so that we can create affordable places to live and work that are, safer, healthier and use less energy. Global demand for efficient buildings is rising rapidly, driven by the pressures of urbanisation, affordability, and the need to cut emissions. By taking a lead in the UK, we can increase our ability to export.
The future
Engagement workshops

Industrial Strategy consultation closed

Jan-Mar 2017

Apr-Jun 2017

Jul-Sep 2017

Oct-Dec 2017

Jan-Mar 2018

Apr-Jun 2018

Announced first challenges in March

First Wave of funding Announced

Competitions for first wave of challenges

Engagement about future years

Scaling first wave of challenges

Second wave Challenges

Second wave competitions for FY18/19

Delivered by

UK Research and Innovation

Innovate UK
What is a challenge?

- It is a very specific, quantified industrial challenge and will unlock benefit elsewhere.

- An example of a clear articulated challenge could be:

  To deliver a 30% increase in agricultural productivity, double growth and exports in the advanced agriculture technology sector by 2025 and significantly reduce environmental impacts.

- This is focused on a clear goal. Success should be obvious when achieved and could be delivered through progress in a range of technologies (e.g. quantum computing). The challenge has an easily explainable real world impact and a future market.
What is a challenge?

- A bad example of a challenge would be:

  To fund SMEs to work with universities to increase the transfer of technical expertise in agricultural sciences to business around the UK

- This is not specific about the outcome and instead focusses on knowledge transfer in a specific technology. The impact of the challenge would not be obvious to a ‘person on the street’ and there is no relation to the specific market this challenge would open up.
• A compelling, focused challenge articulated in a way that anyone will understand and see the benefit of solving

• **Not** ‘business as usual’ or already funded through other means

• Business-led, improving productivity and economic benefit across the UK

• Not just a bid for more money – clear milestones to success by 2021/2022

• Think: “**Not what ISCF can do for you, but what you can do to help ISCF.**”
Place and the Industrial Strategy: What challenges and new opportunities for universities?

Kevin Richardson
Local Growth Consultant
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January 2018
Tough Challenges for the Industrial Strategy

• Long run / structural trends in productivity and of place; historical path dependency & ‘lock in,’ the fixed location of hard and soft assets, largely unaffected by multiple previous short lived initiatives. UK levels of productivity often similar or worse than Poland, Hungary, Slovakia and former DDR. What future spatial impacts of Brexit? (McCann)

• Size and impact of London & South East (scale, power, investment, revenues, etc.); little evidence of spill overs. Elsewhere limits of agglomeration; building minimum scale, density and thickness

• Spatial implications of aspatial policies; no recent culture of territorial / industrial / spatial planning: unsettled urban / rural divides and units of analysis and planning of sub national geographies.

• Institutions matter but short term ‘boosterism’ v. long term realistic pragmatism (e.g. Fraunhofer) of withered / complex / disputed Multi Level Governance (departmentalism, corporate or institutionalist approaches)- leadership or partnership? Elected or otherwise?

• What kind of growth? For whom and for where?
Industrial Strategy: New Strategic Opportunities for Universities

- New Knowledge Exchange Framework (?
- From Science and Innovation Audits to (spatial aspects of) Sector Deals
- New International Research & Innovation Strategy
- Local Industrial Strategies – how different to existing local and/or national strategy?
- (and new local inclusive growth strategies in many places)
- From a focus on ‘cities’ alone to one on ‘cities, towns and rural areas’ e.g. Grimsby
- More robust LEPs with clarified boundaries and stronger Elected Mayoral Combined Authorities
Industrial Strategy: New Funding Opportunities for Universities

• Spatial delivery / testing opportunities offered by Industrial Strategy Challenge Fund (£1 bn + £0.75 bn)

• Spatial targeting of additional £300m for PhDs, Fellowships and KTPs

• Influencing the design of the Shared Prosperity Fund

• £115 million (pa?) Strength in Places Funds

• Remaining EU ESI funds – opportunities being lost but Phase 1 Brexit deal means now enough time remaining

• Growth in Higher Education Innovation Fund to £250 million pa (linked to IS)

• Government *committed* to 100% retention of business rates
Universities and Local Knowledge Exchange: What lessons from Local Growth Academy?

• From simple representation on LEPs to stronger / corporate commitments as system leaders (ref KPMG), building capacity of ‘boundary spanners’ through action learning (Prof Goddard et al) and performance management of external engagement

• Understanding relative institutional capacities; contributing when needed. Pace and aligned timetables are important.

• From linear approaches of ‘technology push’ to more complex horizontal partnership approaches to grand societal challenges e.g. RC funded Urban Living Laboratories / City Futures programmes

• From grant dependency on capital funding; building new forms of revolving and risk based finance, turning capital into revenue where possible

• Improving the supply side but also driving local demand for goods and services (ref Prof Pike et al)
Delivering The Industrial Strategy - The Role of Local Anchor Institutions

This free event, co-hosted by HEFCE, the LGA, the NHS Confederation and UUK will bring together leaders from across Local Government, Higher Education and Health and Care to explore the local partnerships necessary to deliver the Industrial Strategy. The event will focus on the key challenges and opportunities the partnerships face, and will include case studies from leading institutions. Attendees will leave with a deeper understanding of how to engage with the strategy locally, and the insight to help drive local implementation.
Building Effective Partnerships at the University
Adrian Dawson
Director of Research & Innovation
Building effective partnerships & getting the most out of collaboration
Why don’t business and Universities work together.....
Understanding motivations

- Research Impact
- Research outputs and publications
- Informing teaching
- Creating value
- Gaining market advantage
- Accessing expertise
- Increasing profits

Research Impact
Getting the right match!

Well, you're hired! Research is research, isn't it?

My background is in Quantum Physics, but on the plus side, I'm free to begin the study of pre-school gardening programme on the 12th.

Get the right academic for the job
Creating the conditions

- Align goals and objectives
- Collaboration agreements
- Nurture relationships over time
- Address IP
- Seeing the bigger picture
- Commercial sensitivities
- Lambert Toolkit -
Building bridges

Enterprise Solutions
0800 052 5600
enteprisesolutions@plymouth.ac.uk

www.gaininbusiness.co.uk

Research and Innovation Business Partners
Panel Q&A
Professor Jerry Roberts
Deputy Vice-Chancellor Research & Enterprise
The Industrial Strategy - Making it work for you!
Showcasing Academic Capabilities
Professor Martin Attrill
Associate Head of School & Professor of Marine Ecology
Martin Stoelen

Innovate UK
Fieldwork Robotics Ltd

- Dr Martin F. Stoelen, Director & Lecturer in Robotics
- Plymouth University spin-out company (2016)
  - Robots for picking soft fruits and vegetables
  - Robots for research groups
  - Currently 10 staff and funded students
- Substantial Research/Innovation funding:
  - Received: > £500k
  - Submitted: > £500k
  - Proposals: >£200k
Autonomous and selective raspberry harvesting

- Raspberries - A market ripe for picking robots
  - Manual labour often > 50% of cost
  - No current automated solutions
- Complex foliage, sunlight, wooden poles, ++
  - We have the technology to robustly operate robots in this environment!
  - Aiming for 1st raspberry picking robot
  - Local farmers in Plymouth used as testbeds
What we are looking for:

1. Local manufacturing companies
   - CNC machining (aluminum, plastic, steel)
   - Composite materials (CFRP)
   - Mobile platform/robotics

2. Fruit and vegetable producers

3. As a research lab – KTP opportunities
   - We can do custom robotics solutions
Beyond Blue Skies:
Successful industrial-academic partnerships through Plymouth Electron Microscopy Centre

Natasha Stephen
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What is FIB-SEM?

FIB-SEM is Focused Ion Beam, Scanning Electron Microscopy
Collaboration Opportunities with PEMC

Thank You!

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Marine-i

£9.3M Partner Collaboration (of which £6.8M ERDF) incl £3.18M in grants via the Marine Challenge Fund
Marine-i
Industry Research, Development & Innovation around 4 interconnected themes

- Marine Environmental Technology
- Marine Operations
- Marine Energy
- Marine Manufacturing
Marine-i

If you are:

• A company based in Cornwall and the Isles of Scilly
• An academic seeking industry partners in Cornwall and the Isles of Scilly
• A company interested in collaborating or directly operating within the region
• Looking to start a company in the region

Get in touch:

www.marine-i.co.uk
info@marine-i.co.uk
+44 (01872) 327 767
Marine Business Technology Centre (MBTC)

£4M Partner Collaboration (of which £2.4M ERDF) incl
£1.37M in infrastructure and in-sea testing
Industry Research, Development & Innovation utilising new and upgraded in-sea testing assets
If you are:

- A company based in Devon
- An academic seeking industry partners in Devon
- Looking to incorporate in Devon

Get in touch:

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+44 (01752) 588 301
Matching energy demand with cyclical changes in population

Dr Alan Smith, Lecturer in Environmental Management

“One of the many applications of AI and data analytics technologies is to enable more efficient use of energy and resources.”

Industrial Strategy White Paper 2017, p. 41

Alan.Smith@plymouth.ac.uk Twitter: @DrAlanSmith_
Research: what we do

- Dynamic population modelling
  - Time-specific population estimates
  - High spatiotemporal resolution
  - Mostly open source
  - Big data analytics

Relevance to UKIS?
- RCUK Digital Economy
- Data driven economy
- Business solutions
- Ideas, Infrastructure
- Synergies between systems

Smith et al. (in review)
Matching energy demand with cyclical changes in population

- Visitors in SW England: seasonal cycles (Smith et al. 2015)
- Perth (WA) spatiotemporal population (Smith et al. in review)
- Energy consumption, household occupancy, second homes

- Predictable daily commuter flows
- Creating realistic population estimates
- Constraining population to likely areas of placement
- UN SDG 11: Sustainable Cities

- Industrial partners: energy distributors, utility companies, local authorities?
- Secure data environments
- Energy demand and billing data: geo-privacy

Alan.Smith@plymouth.ac.uk Twitter: @DrAlanSmith_
Dr Abigail McQuatters-Gollop
Biodiversity: from data to decision-making

Lecturer Marine Conservation
Marine ecologist and policy expert
Chair of international biodiversity expert groups for policy
- EU Marine Strategy Framework Directive
International collaborations and leadership
Biodiversity: from data to decision-making

Data analysis
- Time-series and spatial data analysis
- Identify change and trends in biodiversity component
- Provide context for decision making

Scientific research
- Indicator development
- Indicator interpretation
- Apply science to policy needs
- Provide context for decision making

Policy expertise
- Steering of science for policy needs
- Knowledge brokering
- Interpret policy needs
- Science-policy communication
- Delivery of ecosystem approach
- Inform monitoring programmes
- Policy assessment and reporting
I’d like to collaborate with:

• Civil service
• Government departments
• Policy makers
• Small businesses
• Media
• City councils
• Scientific researchers
Gerd Masselink
CMAR - Coastal Marine Applied Research

A research-informed consultancy to address important issues in the coastal and marine environment

What we offer

- Services
- Equipment
- Projects
- Links
Mapping of nearshore current circulation around Ventnor Haven entrance

Quantification of Beach Risk in the UK and Republic of Ireland

Coastal Impacts of wave energy devices at Killard, County Clare

Intertidal Habitat Creation Feasibility study in the Tamar River
Clients
• Environment Agency
• Royal National Lifeboat Institution
• CH2M
• Liverpool University
• Southampton University
• National Trust
• Private landowners
• Coastal/District Councils
• Royal Haskoning
• Deltares
• Electricity Supply board of Ireland
• Scottish Environment Protection Agency
• Duchy of Cornwall

Co-creating operational and strategic modelling systems to reduce impacts of coastal hazards
The Industrial Strategy - Making it work for you!