

**Innovate UK**

# **Delivery Plan**

**Shaping the future**

2017-2018

# Impact stats

**£2.2bn**

invested in  
business-led  
innovation

up to  
**£16bn**

in added value to  
the economy

up to  
**£7.30**

of GVA for every  
£1 invested

**8 jobs**

created for  
every business  
invested in

**70,000  
jobs**  
created

Impact figures have been calculated on the basis of our published evaluations of collaborative R&D, feasibility studies, Smart, and Knowledge Transfer Partnerships. Together, these programmes represent 90% of our direct support for business-led innovation since 2007.

**Evaluation of the Collaborative Research and Development Programmes**

[http://webarchive.nationalarchives.gov.uk/20130221185318/http://www.innovateuk.org/\\_assets/pacec\\_evaluation\\_of\\_crandd\\_report\\_final260911%20\(2\).pdf](http://webarchive.nationalarchives.gov.uk/20130221185318/http://www.innovateuk.org/_assets/pacec_evaluation_of_crandd_report_final260911%20(2).pdf)

**Evaluation of Technology Strategy Board's (now Innovate UK) Feasibility Studies**

<https://www.gov.uk/government/publications/evaluation-of-technology-strategy-boards-feasibility-studies>

**Evaluation of Smart: Impact and Process Evaluation**

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/467204/Smart\\_Evaluation\\_-\\_Final\\_Final\\_Report\\_7\\_October.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/467204/Smart_Evaluation_-_Final_Final_Report_7_October.pdf)

**The Knowledge Transfer Partnership programme: an impact review**

<https://www.gov.uk/government/publications/the-knowledge-transfer-partnership-programme-an-impact-review>

**£3.75bn**

total value  
of projects  
supported

**8,000**

organisations  
supported

**11,000**

projects funded

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**I want to know what's going on...**

Sign up for our newsletter or alerts on **gov.uk**

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**I want to find connections...**

Join the **Knowledge Transfer Network**

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**I'm looking for funding...**

Take a look at our **competitions**

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**I want to export...**

Talk to one of our **National Contact Points**

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**I want to work with European partners...**

Talk to **Enterprise Europe Network**

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**I want European funding...**

Have a look at the **Horizon 2020 competitions**

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**I want to meet like-minded people...**

Come along to an **Innovate UK event**

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**I want to find out more about the world of innovation...**

 Watch our videos on **YouTube**

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Visit

**innovateuk.gov.uk**

# Foreword

Research and innovation has never been higher on the agenda. Publication in January 2017 of the government's green paper *Building our Industrial Strategy* has put innovation at the heart of improving living standards, creating well-paid sustainable jobs and driving economic growth across the whole country. All this is in the context of a drive for UK businesses to 'go global' with their ambition. Our team is continuing to drive and support ambitious and innovative businesses all over the UK.

As part of the government's industrial strategy, the first wave of the Industrial Strategy Challenge Fund offers a welcome £1 billion 4-year investment into research and innovation, to enable the UK to lead in areas of strategic importance. Innovate UK will be a leading organisation in delivery of the ISCF. This is an opportunity for even closer working with the research councils as we move into UK Research and Innovation, under the leadership of Sir John Kingman as interim chair and Professor Sir Mark Walport as chief executive.

Innovate UK's name and remit will not change, and the establishment of UK Research and Innovation strengthens our duty to promote and accelerate UK business innovation.

I am pleased to present this delivery plan – outlining our actions in the financial

year 2017/18 to accelerate innovation across sectors and to work towards achieving the ambitions of the Industrial Strategy Challenge Fund.

Our 5-point plan remains as relevant as ever, and our sector structure, now a year in operation, has simplified our competitions offering. Businesses are more able to target the funding opportunities that fit their ideas. Businesses also know that they can access our innovation networks – the Knowledge Transfer Network and the Enterprise Europe Network – for innovation advice and help in identifying funding opportunities.

We are adding a new area of support by launching a pilot for innovation loans, broadening the funding options we offer businesses for different stages of their journey from concept to commercialisation. This financial year also sees the launch of our digital funding system, following successful trials.

Our Catapult network continues to support innovative businesses by providing access to the critical facilities and expertise they would not find together elsewhere. We are always evaluating our use of public money to ensure it is well used and to understand which mechanisms work best. This year will see a government-led review of the

Catapult network and mechanism to show us how we can maximise its impact in the context of the industrial strategy. There will also be reviews of some of our previous support programmes such as innovation platforms, innovation vouchers and Smart.

Our most recent portfolio analysis tells us that in the last decade, since our inception in 2007, our £2.2 billion of funding has returned 70,000 jobs in the 8,000 organisations we have worked with.

There are exciting times ahead. We have the opportunity to pull out all the stops, driving economic growth through innovation using all the tools we have available within the Innovate UK family.

I look forward to the year ahead.

**Dr Ruth McKernan CBE**  
Chief executive



**This publication was prepared for summer 2017 and reflects this timing.**

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# Introduction

Innovate UK is the UK's innovation agency. We drive productivity and growth by supporting businesses to realise the potential of new technologies, develop ideas and make them a commercial success.

This delivery plan sets out how we will invest around £500 million in the financial year 2017/18 both in competitions to support business-led innovation and in innovation infrastructure that allows businesses to access leading-edge expertise, equipment and facilities. It describes the first challenges made under the government's new Industrial Strategy Challenge Fund and explains how we will support the best proposals from UK businesses as part of the £4.7 billion investment in research and innovation over the next 4 years.

We also explain how we will add to the types of support available to business by launching a pilot scheme for innovation loans.

We focus our support on 4 key sectors – emerging and enabling technologies; health and life sciences; infrastructure systems; and manufacturing and materials. We also have an open programme that supports businesses innovating in any high-value innovative technology or process in any area of the economy.

## In this financial year, we will:

- deliver our sector-based support and open programme
- take a strong lead on the Industrial Strategy Challenge Fund
- support the Catapult technology and innovation centres as they prepare for the next 5-year phase of development
- work to increase business access to investors
- take new steps to promote and support the global opportunities for innovation available to UK businesses
- launch a pilot scheme for innovation loans
- build on our work to increase the talent pool of innovators developing exciting ideas in the UK

**You can find out more about our work at:**  
[www.innovateuk.gov.uk](http://www.innovateuk.gov.uk)

**And apply for one of our funding awards at**  
<https://www.gov.uk/apply-funding-innovation>

# Our strategy

**Our vision is of a growing UK economy in which we inspire and support UK businesses to harness the power of innovation to create the industries and jobs of the future.**

## Funding and connecting

Innovate UK has been successfully helping industry to commercialise world-class UK research for the last 10 years. We help businesses to identify the potential in new technologies and to turn them into the new products, processes and services that will significantly grow the UK economy. Most of our staff come from a business background, so we can offer relevant support to businesses in getting to market and scaling up.

### We provide support in 2 main ways:

- **funding** – to help businesses to develop the new products, processes and services that will meet or define the markets of the future
- **connecting** – to bring businesses together with the right partners, expertise, facilities, financiers and influencers that can help them bring their ideas to market

### We channel our support through 4 sectors:

- **emerging and enabling technologies** – including high-potential technologies just emerging from university or other research, and cross-cutting

technologies and capabilities such as digital, satellite applications, sensors, robotics and design

- **health and life sciences** – including health and care technologies, agriculture, food and biosciences
- **infrastructure systems** – including connected transport, energy systems and supply, and urban living
- **manufacturing and materials** – including new manufacturing and materials technologies, processes, business models and systems, resource efficiency and exploitation of digital approaches

We also have an open programme to provide grants to any innovative UK company working in any high-value innovative technology, business model or process in any area of the economy.

Our funding is offered to the companies that submit the best proposals in a competitive application process.

The Government recently announced the creation of an Industrial Strategy Challenge Fund (ISCF), as part of its new industrial strategy. We have played a key role in the development of the ISCF and will now play a central part in its delivery.

## Our 5-point plan

**Our sector-based approach is backed by 5 cross-cutting goals that we call our 5-point plan.**

**We will:**

- 1** turn scientific excellence into economic impact and deliver results through innovation, in collaboration with the research community and government
- 2** accelerate UK economic growth by nurturing high-growth potential SMEs in key market sectors, helping them become high-growth, mid-sized companies with strong productivity and export success
- 3** build innovation excellence throughout the UK, investing locally in areas of strength
- 4** develop Catapult centres within the UK's national innovation network to provide access to cutting-edge technologies, encourage inward investment and enable technical advances in existing businesses
- 5** find new ways of funding to ensure the businesses we work with get the right kind of funding at the right time and help public money go further and work harder



### Success story:

## Run3D sets the pace

University of Oxford spinout Run3D used an Innovate UK grant to help it to develop a prototype 3D gait analysis system for use in sports clinics that can pinpoint the causes of injury and allow athletes to correct their running style. The biomechanical engineering company founded by Dr Jessica Bruce, pictured left, with physiotherapist and clinical lead Andrea Bachand, centre, now has sports clinics in Oxford, London, Surrey, Essex, Hampshire and Dublin.

## Going global

More than 95% of all global research and development and innovation (by spend) takes place outside the UK, and much of the market growth is expected in the emerging economies.

UK companies need to access global knowledge, develop new partnerships and expand into growing global markets.

We are working on a new international strategy that will ensure UK businesses are able to take advantage of global opportunities, particularly in Europe, North America and Asia.

This will build on the work we are already doing to support businesses through overseas entrepreneur missions, the European Horizon 2020 programme, and through Newton Fund competitions for funding to address socio-economic challenges in emerging economies around the world.

## UK Research and Innovation

Innovate UK will come together with the research councils and the newly-formed Research England (formerly the research funding element of the Higher Education Funding Council for England) in one single strategic body, UK Research and Innovation, from April 2018.

We will operate under a single strategic organisation but retain our individual identity, our business focus and our separate funding for businesses to develop their innovative ideas.

The strategic objectives were laid out by interim chair of UKRI Sir John Kingman and include:

- a unified voice for continued strengthening of the UK research and innovation system
- leading on development and delivery of a coherent national research and innovation strategy
- better prioritisation of resources
- maximising impact of Innovate UK in supporting business-led innovation
- promoting stronger commercialisation, business and policy links and wider societal engagement with publicly funded research
- nurturing and improving research and innovation talent

# Industrial Strategy Challenge Fund

**The Government has announced an additional £4.7 billion investment in research and development by 2021 as part of its new industrial strategy.**

More than £1 billion of this will be invested in the first wave of the Industrial Strategy Challenge Fund (ISCF) across Innovate UK and the research councils in an initial 6 key areas over the next 4 years.

The ISCF will bring together the UK's world-leading researchers and ambitious businesses to meet the challenges head on and deliver market-leading commercial products and services. It will ensure that scientific investment truly delivers economic impact, jobs and growth right across the country.

Innovate UK and the research councils will deliver the ISCF in 2017/18. From April 2018, UK Research and Innovation will manage and deliver the fund.

**Building our  
#IndustrialStrategy**

## The challenge areas

### The first 3 ISCF competitions are:

- £246 million in clean and flexible energy, called the Faraday Battery Challenge, to lead the world in the development, design and manufacture of batteries that will power the next generation of electric vehicles, anchor high-value jobs in the UK, and help tackle air pollution
- £197 million to develop first-of-a-kind technologies for the manufacture of medicines that will speed up patient access to new drugs and treatments, building on the exporting strengths of the UK's biopharmaceutical sector
- £93 million to make industry and public services more productive by developing artificial intelligence and robotics systems that can be deployed in extreme environments that occur in off-shore energy, nuclear energy, space and deep mining



### Success story:

## Micro-Fresh: a global brand

Leicester entrepreneur Byron Dixon turned his passion for chemistry into a business with a global reach. His innovative Micro-Fresh product stops smells and germs forming in products ranging from leather sofas to shoes, bags, clothing, and mattress and pillow covers. The business sells into China and many other parts of the world and is opening offices in the United States. A recent study funded by Innovate UK found Micro-Fresh could be extended to preventing mould growing on plaster on walls.

### A further 3 additional areas will receive ISCF investment over the next 4 years.

#### They are:

- £38 million to develop the next generation of artificial intelligence and control systems to ensure the UK is at the forefront of the driverless cars revolution
- £26 million to develop the next generation of affordable, light-weight composite materials for aerospace, automotive and other advanced manufacturing sectors
- £99 million for a satellite test facility supporting new launch technologies and the manufacturing and testing capabilities that will allow the UK to construct future satellites and deliver payloads into orbit

### Our role

#### During 2017/18, we will:

- run funding competitions that seek collaborative consortia to address the challenges
- help businesses, particularly SMEs, play their part in meeting the cross-sector challenges
- host events to encourage researchers and businesses to form multi-disciplinary consortia so that they can address the challenges
- hold workshops and other activities to help identify and refine the next industrial strategy challenges

We expect our investments to have a balanced geographical distribution and for there to be a range of

projects, from the development of prototypes to the building of demonstration facilities

**See the latest ISCF opportunities and work: <https://www.gov.uk/government/collections/industrial-strategy-challenge-fund-joint-research-and-innovation>**



# Funding competitions at-a-glance

Budget up to

## April

International collaborative funding: China cities and open – Jiangsu	£5m
International collaborative funding: China cities and open – Shanghai	£5m
Knowledge Transfer Partnerships (throughout year)	£31m including co-funding
Newton Fund: UK-Malaysia urban innovation challenge	£3m
<b>SBRI – Encouraging cycling and walking (DfT)</b>	<b>£470k</b>
<b>SBRI – Autonomous supply to military front line (MOD)</b>	<b>£1.5m</b>
<b>Connected and autonomous vehicle test bed</b>	<b>£55m</b>

## May

Design foundations	£1m
Investment partner competition: health and life sciences	£3m + investor funding
Investment partner competition: infrastructure systems	£3m + investor funding
Manufacturing and materials	£15m
<b>Energy Catalyst</b>	<b>£13m</b>
<b>Aerospace Technology Institute batch 21</b>	<b>£75m</b>

## June

ISCF – Robotics and artificial intelligence demonstrator	£6m
ISCF – Robotics and artificial intelligence collaborative R&D	£10m
Newton Fund: UK-China agri-tech challenge	£8m including co-funding
Newton Fund: UK-India industrial waste challenge	£8m including co-funding
Eurostars	£2.5m
Open competition	£15m

## July

Quantum technologies	£9m including co-funding
Newton Fund: UK-Guangdong urban innovation challenge	£3m
Infrastructure systems	£15m
Biomedical Catalyst (also November and March)	£10m
ISCF – Digital Health Technology Catalyst round 1	£8m
ISCF – Faraday Battery Challenge innovation round 1	£40m
ISCF – Faraday Battery Challenge manufacturing	£40m

*Text in red denotes competitions run by Innovate UK on behalf of funding partners.*


**Budget up to**
**July (continued)**

SBRI – Business productivity portal	£500k
SBRI – Machine learning	£250k
SBRI – Speeding up cancer diagnosis (NHS)	£1.1m
SBRI – Improving crowd resilience (Home Office)	£2m
Vehicle to grid competition 1 (OLEV)	£20m
Advanced Propulsion Centre competition 8	£35m
Connected and autonomous vehicles (C-CAV)	£25m

**September**

Emerging and enabling technologies	£15m
ISCF – Medicines manufacturing CR&D round 1	£15m
ISCF – Advanced therapies treatment centres	£30m
Precision medicine	£6m
Accelerating innovation in rail 5	£7.9m
SBRI – Prison detection systems (MoJ)	£950k
SBRI – Exploiting data science to improve cancer care (Data Lab)	£425k
SBRI – Reducing use of animals in research (NC3RS)	£2.7m
Integrated delivery programme competition 14 (OLEV and ISCF)	£20m

**October**

Health and life sciences	£15m
ISCF – Medicines manufacturing and innovation centre	£13m
ISCF – Vaccines development and manufacturing centre	£66m
ISCF – Viral vector manufacturing for cell and gene therapies	£16m

**November**

Newton Fund: India-UK innovation challenge	£1.4m
Biomedical Catalyst (also July and March)	£12m
Infrastructure systems and manufacturing and materials	£19m

**December**

Eurostars	£2.5m
Open competition	£19m
Energy catalyst	£4m

**January**

Emerging and enabling and health and life sciences	£19m
ISCF – Faraday Battery Challenge innovation round 2	£30m
ISCF – Digital Health Technology Catalyst round 2	£10m

**February**

Open competition	£19m
ISCF – Extreme robotics challenge	£20m

**March**

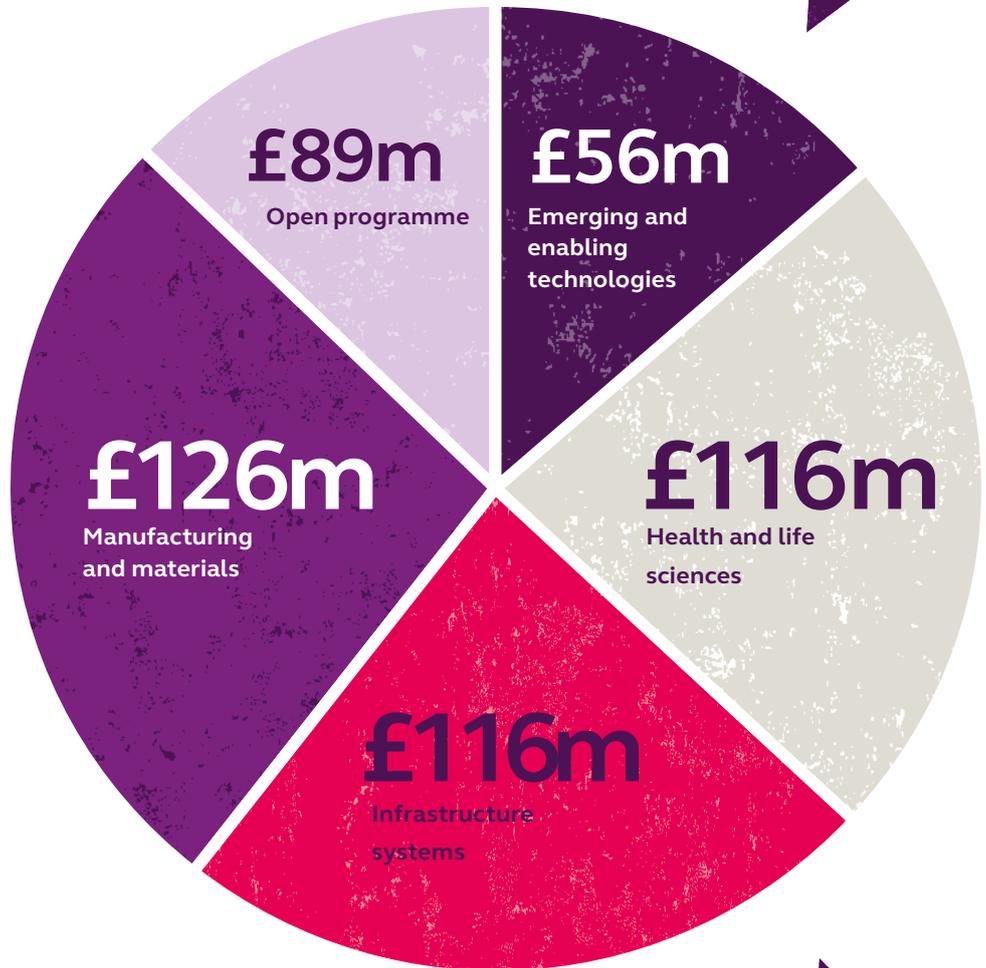
Biomedical Catalyst (also July and November)	£12m
ISCF – Medicines manufacturing CR&D round 2	£10m

**Timing subject to confirmation**

Advanced Propulsion Centre competition 9	TBC
Connected and autonomous vehicles UK test bed 2 (C-CAV)	TBC
Aerospace Technology Institute batch 22	£75m

## Budget 2017/18

The pie charts show how expenditure on our core budget breaks down approximately across the sectors we support and how much additional money will be invested in delivering the Industrial Strategy Challenge Fund



## Spending on ISCF



# How we are helping business

**Innovate UK supports ambitious UK businesses to grow by helping to fund their groundbreaking projects and by connecting them to the right partners.**

## Funding

Our funding helps UK businesses to develop the groundbreaking technologies that will meet and define the markets of the future. We provide core funding for innovation infrastructure in the UK, including the network of Catapult innovation and technology centres, and we fund a wide range of innovative business projects through our competitions.

We will run funding competitions this year in each of our sector programmes. They will have a broad sector scope and will focus on the particular innovation challenges and opportunities in each sector.

We will also run funding competitions in our open programme to provide grants for the best innovative ideas that could come from any innovative UK company working in any high-value innovative technology, business model or process in any area of the economy.

In 2017/18, the second round of funding competitions in our sector programmes will comprise two competitions, each covering two sectors. This enables an additional open competition to run and provides more opportunities for businesses across the economy

to apply for funding at a time more suitable to their business and innovation development cycle.

We will also deliver competitions for grants or contracts on behalf of government departments or other public sector organisations.

## Working globally

We will work with emerging economies to translate the UK's innovation expertise into business solutions for socio-economic challenges. The Newton Fund competitions support UK companies to establish global partnerships and exchange knowledge with organisations in some of the most dynamic markets in the world, such as China, India and Malaysia.

They will address challenges such as air pollution, rapid urbanisation and the production of nutritious, safe and affordable food. This year, we will expand the Newton Fund Global Innovation Policy Accelerator programme – a professional development programme for innovation leaders from Newton Fund partner countries.

We will continue to support business participation in European Commission programmes, such as Horizon 2020,

through the European Enterprise Network, Knowledge Transfer Network and our expert team of national contact points. These programmes help innovative SMEs grow and scale, and build collaborations, partnerships and supply chains in the EU and beyond.

Although the UK is set to leave the European Union, the UK government has guaranteed to honour all EU funding commitments to UK enterprises.

## Investment criteria

**Investment decisions across all our programmes are guided by 4 fundamental questions:**

- what are the global opportunities?
- what are the unique strengths that the UK brings to those opportunities?
- is the timing right?
- why is public sector investment required?

This ensures that we are committing public funding and support to the projects and businesses most likely to succeed and grow the UK economy.

## Our priorities for 2017/18

We will help businesses to prepare for and take up the opportunities offered by the Industrial Strategy Challenge Fund, including holding funding competitions and hosting events and workshops. Alongside this, we will continue our core funding activities, including our sector-based competitions and investment in innovation infrastructure such as the Catapult network and innovation and knowledge centres.

We continue to look at ways to make public money work harder and to ensure the businesses we work with get the right kind of support at the right time. We are working with partners including BEIS and the British Business Bank to run a pilot for innovation loans that will support businesses in the space between grants and the point at which the market will provide appropriate finance or investment.

### We will:

- invest up to £151 million in our sector-based and open programme competitions
- invest up to £34 million in the Biomedical Catalyst
- invest up to £6 million in investment partner competitions
- invest up to £10 million in collaborative funding competitions with China
- invest up to £15.4 million in Newton competitions not including co-funding
- invest around £237 million in core funding for the Catapult centres and other innovation infrastructure
- launch a £50 million pilot scheme for innovation loans

### Success story:

## Lontra eyes £50 billion market

A new type of compressor devised by Lontra chief executive Steve Lindsey, pictured, could be manufactured in the UK and grab a share of a £50 billion global market. Lontra's Blade Compressor®, developed with support from Innovate UK, produced energy savings of 21.2% in a trial at a Severn Trent Water sewage plant. The company has signed a multi-million pound licensing deal with Sulzer, a global leader in pumping equipment, to supply into the municipal and regulated wastewater market. It is also looking at opening a manufacturing plant in the Midlands.





## Success story:

### Catalyst for growth

Chemoxy, a speciality chemical manufacturer, identified a way to re-use a waste product but the process resulted in hazardous waste and wasn't economically viable. The company made connections through the Knowledge Transfer Network and received funding from Innovate UK to identify a bio-catalytic solution. When the process has been fully optimised, the scale-up will result in a £6 million investment in Chemoxy and job creation for consortium partner Biocatalysts Ltd.

## Connecting

Bringing people together and joining them to the right kind of partners is a vital part of how we support businesses to make a success of their innovative ideas and to grow.

### It means:

- connecting businesses to partners, customers, supply chain, research base, business management expertise and investors
- reaching out globally to new partners and opportunities, including running missions to help UK businesses find prospective partners and markets abroad

We take this approach across Innovate UK, but it is particularly embodied in our business-facing networks, the Knowledge Transfer Network (KTN) and the Enterprise Europe Network (EEN), and in our regional and national teams.

## Our priorities for 2017/18

In this financial year our Knowledge Transfer Network (KTN) will develop a new dedicated team of knowledge exchange advisors to support the Knowledge Transfer Partnership programme and wider knowledge exchange opportunities. We are also conducting a review of KTN activities and impact to establish the model for KTN beyond March 2018 when its current grant period ends.

We will increase efforts through the Enterprise Europe Network to help high-growth potential businesses – including Innovate UK grant winners – to grow and scale by assessing each company and agreeing an action plan. For some companies this will include going through the new 'Innovate 2 Succeed' programme that provides fully funded one-to-one support to help SMEs to make a commercial success of their innovations.

We are developing our regional strategy by working with the local enterprise partnerships in England and with partners in Scotland, Wales and Northern Ireland to identify opportunities for working together in each of our sectors in line with regional strengths.

We will also develop a series of investment showcases based on a successful pilot that took place in 2016/17. We will select businesses from those we have supported, or that partners have recommended to us, and offer them the chance to pitch for investment to a panel of relevant investors.

# Innovate UK funding supports businesses working across the UK and globally



## California

Overseas mission for businesses working in space technologies

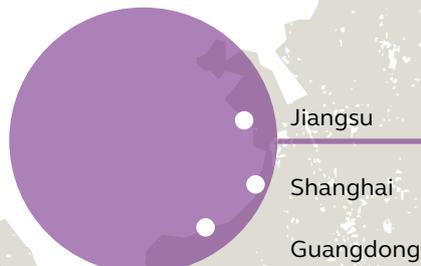
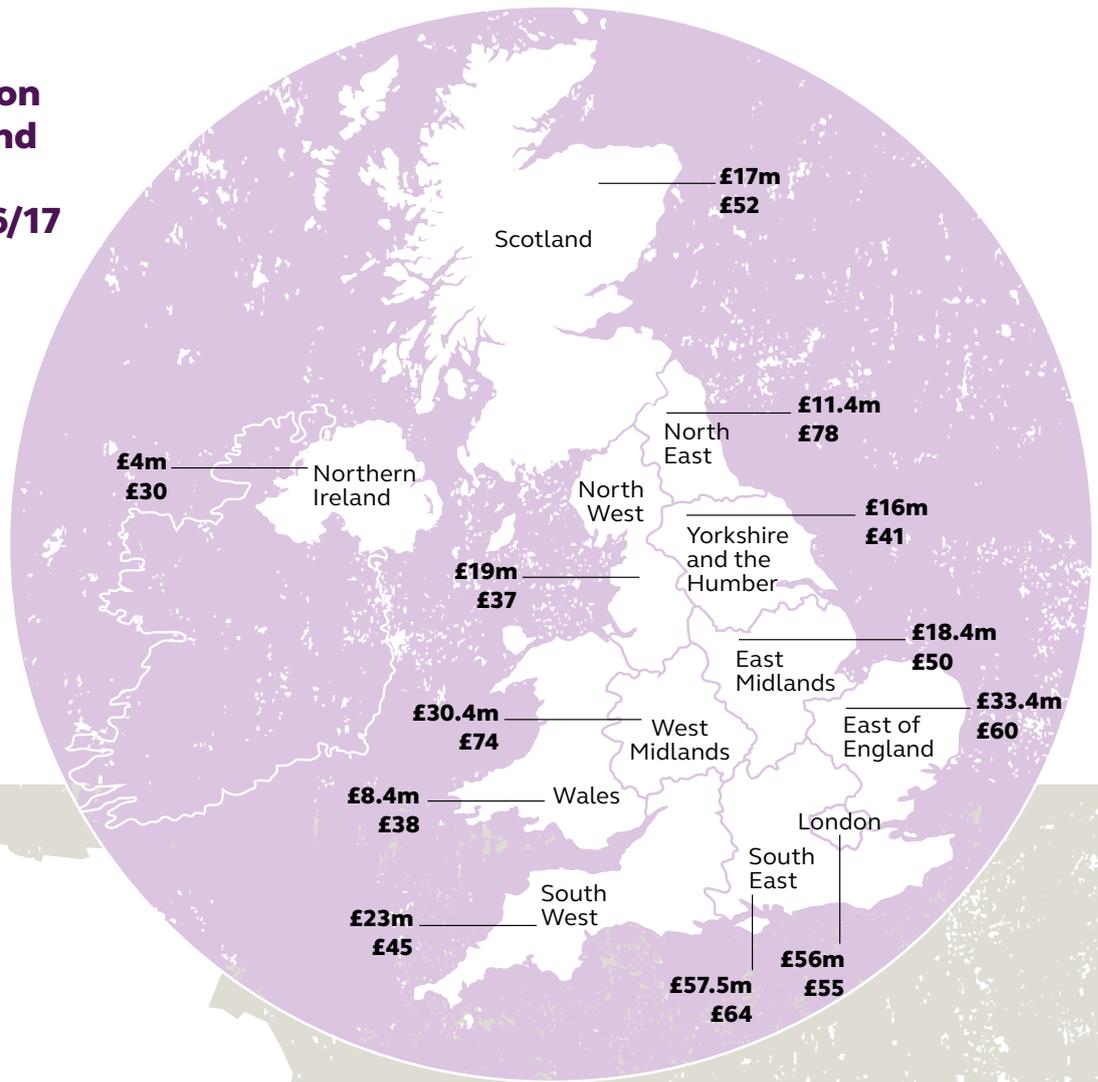


## Europe

Eurostars **£5m**

Horizon 2020 European programmes

## Spending by region and regional spend per business by Innovate UK 2016/17



### India

Newton Fund: technology solutions  
**£1.4m**

**Newton Fund:** reduction of industrial waste and pollution  
**£8m** including co-funding

### Malaysia

Newton Fund: sustainable cities **£3m**

### China

International collaborative funding:  
**Shanghai and Jiangsu £5m**

Newton Fund: urban living challenges  
**Guangdong £3m**  
International collaborative funding

**China (open) £5m**

Newton Fund:  
UK-China agri-tech innovation  
**£8m** including co-funding

# Catapult centres

**The Catapults are a network of world-leading centres designed to transform the UK’s capability for innovation in specific areas and help drive future economic growth.**

## Introduction

Catapults provide innovators with access to expertise, equipment and facilities that may not be available from the market. The Catapults are independent organisations that receive core funding from government through Innovate UK. They use this funding to provide facilities for research and development and to attract matching funding from business. There are 7 well-established Catapults, and a further 3 have either been set up recently or announced. They all have their own strategies and delivery plans.

## Catapult network review

The 5-year funding period for the first of the Catapults, the High Value Manufacturing Catapult, ended in March 2017. The well-established Catapults in cell and gene therapies, offshore renewable energy, satellite applications, digital, transport systems and future cities reach the end of their approved periods in March 2018.

We are taking the opportunity to review the past performance and forward plans of the Catapults to ensure they

meet future business needs. The 7 well-established Catapults are undergoing an independent economic analysis of their impact on the sectors they serve, and this will continue up to 2020. This analysis will feed into individual Catapult review committees, made up of independent reviewers, and into the Catapults’ delivery plans and internal performance reviews.

In addition, the Government has commissioned an overarching and wholly independent review of the whole Catapult network to ensure it is aligned with the Government’s new industrial strategy and providing value for money. The review of the network will provide recommendations to ministers on future government investment in Catapults based upon the findings of the Catapult review committees; future delivery plans of all Catapults; the current governance and management of Catapults; how they align with emerging industrial strategy priorities and whether other government-funded organisations could come under the Catapult brand.

The Catapult network review will report findings and recommendations on the Catapult network to government ministers in the autumn.

- **High Value Manufacturing** – providing the cutting-edge equipment and the skilled resources UK businesses need to commercialise their world-class manufacturing technologies  
**Strathclyde, Ansty, Rotherham, Wilton, Sedgefield, Darlington, Bristol, Coventry**

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- **Offshore Renewable Energy** – advancing innovation in wind, wave and tidal energy  
**Blyth, Glasgow, Levenmouth**

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- **Energy Systems** – transforming our energy system and capturing the new commercial opportunities  
**Birmingham**

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- **Transport Systems** – stimulating innovation in intelligent mobility  
**Milton Keynes**

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- **Future Cities** – developing the integrated products and services to meet the future needs of cities  
**London**

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- **Digital** – delivering increases in productivity, efficiency and scale through digital innovation  
**London  
Northern Ireland**

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- **Satellite Applications** – making better use of and gaining benefit from satellite technologies  
**Harwell**

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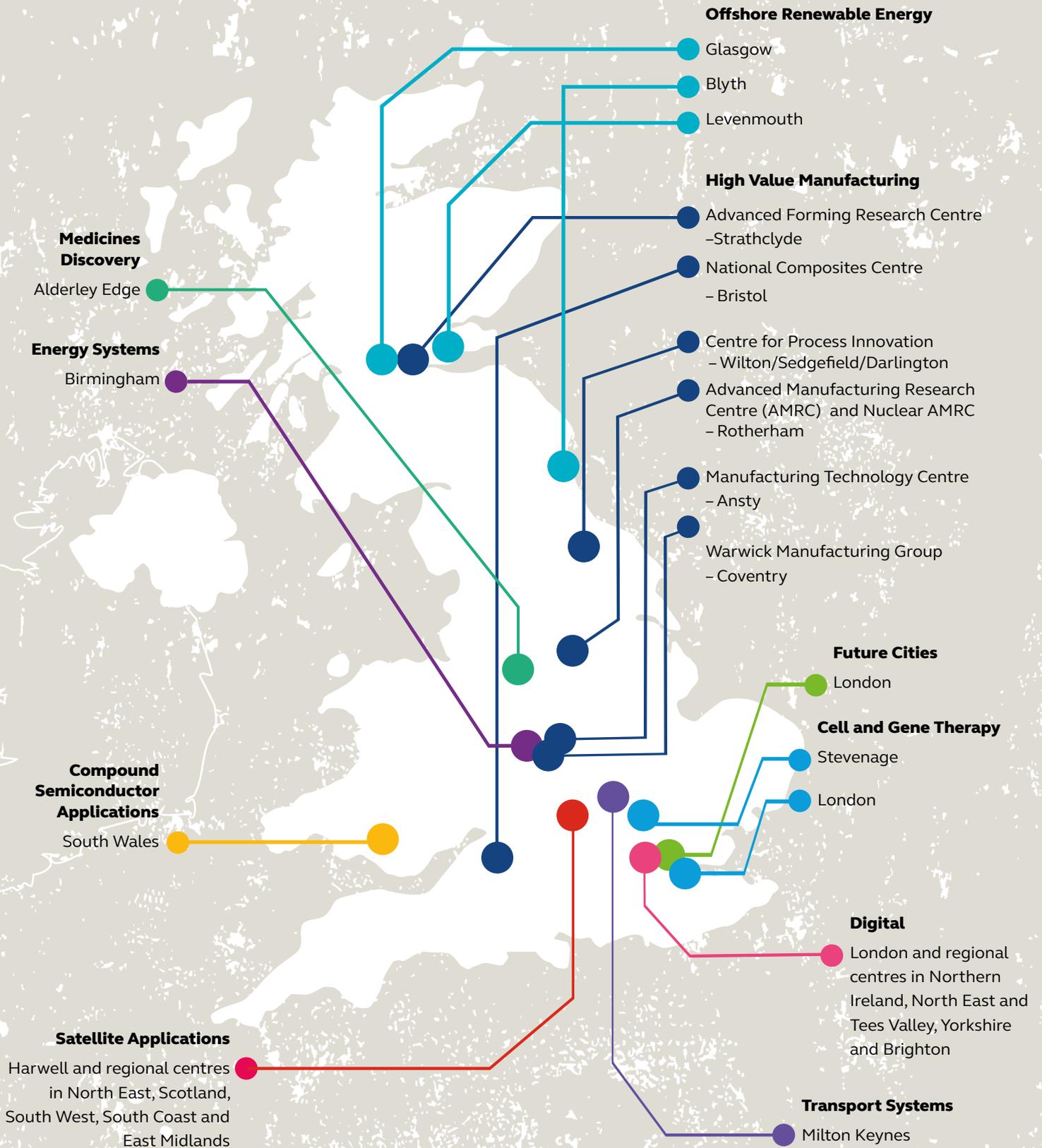
- **Compound Semiconductor Applications** – exploiting the significant advances made by UK researchers in compound semiconductors over the past two decades  
**South Wales**

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- **Cell and Gene Therapy** – translating early-stage research into commercially viable and investable therapies  
**London, Stevenage**

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- **Medicines Discovery** – developing new technologies primarily for the pre-clinical evaluation of new medicines  
**Alderley Edge**



# Emerging and enabling technologies

**Our programme aims to stimulate growth in the UK economy by helping businesses to develop new products, processes and services based on emerging and enabling technologies.**

## Introduction

Our support for emerging and enabling technologies underpins innovation across the whole of the UK economy, providing significant growth potential for UK companies.

An emerging technology is one that is still emerging, or has only recently emerged, from the research base, such as a university or company laboratory. Emerging technologies are newly developed science whose best applications and value have yet to be realised. Examples include quantum technologies, graphene and 2D materials, biofilms, and energy harvesting.

Enabling technologies are based on more established research. Their wide applicability is well understood but their potential for economic impact is greater than has so far been realised.

### Examples of enabling technologies are:

- **digital technologies** – such as machine learning
- **space and satellite technologies** – such as earth observation
- **electronics** – such as compound semiconductors, and sensors and photonics
- **robotics**

Many industries can benefit from advances in areas such as machine learning, compound semiconductors, and earth observation.

We also support enabling capabilities – skills and techniques that enable a closer link between technologies and end users and applications. These capabilities speed up the journey to market, or make the final product more successful. Examples we support are design and the work of the creative economy.

## Challenges and opportunities

The translation of good ideas into sustainable businesses with strong growth is difficult. The applications of emerging and enabling technologies may not always be apparent and they may be a long way from market.

Completely new business models and supply chains may be needed if the UK is to exploit these technologies successfully, and changes may be seen as highly risky. Businesses may also need to change the way they work together, and new standards and regulation may be required for new industries to flourish.

Emerging technologies have the potential to be the billion-pound industries of the future. The global market for key enabling

technologies has been estimated at €3 trillion. Together they have the potential to transform the way we live our lives – from the way we communicate to how we get around and how we live a healthy life.

## Our priority areas

We are investing in a number of emerging technology areas including quantum technologies, biofilms and graphene and will work with our colleagues in the research councils to identify new opportunities.

### We will provide funding for businesses working in enabling technologies and capabilities with high potential, including:

- **digital technologies** – data, artificial intelligence and machine learning, cyber security, distributed ledger, Internet of Things, 5G applications and services, and immersive technologies
- **space and satellite technologies** – exploiting data from satellites and developing new space hardware for future generations of spacecraft
- **electronics, sensors and photonics** – compound semiconductors, photonics-based sensing, laser manufacturing, smart lighting, sensor systems, power electronics, large-area electronics, electronic systems
- **robotics and autonomous systems** – next-generation manufacturing, autonomous transport, working in extreme environments, robotic surgery, independent living, assistive technologies
- **design** – embedding human-centred design at the early stages of innovation
- **creative economy** – high-speed networks, immersive technologies, online platforms, personalisation of digital services

## Funding

We will identify technologies with the greatest market potential, and fund and support their development into new products, processes and services that grow UK companies and deliver economic impact across the whole economy.

### In 2017/18 we will invest up to:

- £24.5 million in competitions that support business projects across our priority areas
- £6 million in quantum technologies
- £1 million in supporting human-centred design activities
- £23.3 million in core funding for the Compound Semiconductor Applications, Digital, and Satellite Applications Catapults
- £500,000 in the Centre for Secure Information Technologies (CSIT) innovation and knowledge centre

We will continue to work closely with the UK Space Agency and the European Space Agency to support business innovation in the space sector and to play our part in implementing national strategies.

## Connecting

### In 2017/18, we will run:

- an overseas mission to California for businesses working in space technologies
- an investor showcase focused on digital innovations
- workshops and brokerage events to encourage UK businesses to compete for the €2 billion available through the Horizon 2020 European programmes in information and communication technologies, space, secure societies, European Innovation Council and future and emerging technologies

### THE ISCF CHALLENGE: Create robots for a safer world

Building our  
#IndustrialStrategy

Advanced robotics could have a global worth of up to \$6.4 trillion a year by 2025 and represent a significant opportunity for UK industry. Robotics and artificial intelligence will generate significant opportunities across many sectors from health to energy, transport, defence and space.

New technologies are difficult to prove in challenging environments because of the difficulty of testing and validating them before deployment to ensure they will work. Meeting this challenge will include enabling the development of autonomous systems that are specifically for use in hazardous and challenging locations such as nuclear reactors and space and in inaccessible places such as offshore and deep sea environments and electricity distribution pylons. Solving this challenge will benefit industrial sectors such as oil and gas, offshore renewables, nuclear, defence, aquaculture, and infrastructure systems.

This is the first year of a 4-year investment of £93 million and will include funding for the research base through the research councils, funding for innovative business projects, and a demonstration programme through Innovate UK.

**Success story:****PragmatlC**

An electronics business that developed a flexible circuit thinner than a human hair – but with the processing power of a silicon chip – has attracted £23.4 million in private investment. Cambridge-based PragmatlC's flexible circuits can be easily embedded in a huge range of everyday items. Its products have been developed with funding from Innovate UK and the European Horizon 2020 programme and with help from the Catapult network.

**Action plan****Emerging and enabling technologies**

<b>Investment</b>	<b>Timing</b>	<b>Budget (up to)</b>
Emerging and enabling technologies competitions	Q2 (September) Q4 (January)	£15m £9.5m (joint £19m competition with health and life sciences)
Quantum technologies (incl co-funding)	Q1	£9m
Design Foundations competition	Q1 (May)	£1m
Space mission	Q3 to Q4	£250k
<b>Catapults and other centres</b>		
Digital catapult	Q1 to Q4	£10.3m
Compound Semiconductor Applications Catapult	Q1 to Q4	£3m
Satellite Applications Catapult	Q1 to Q4	£10m
Centre for Secure Information Technologies	Q1 to Q4	£500k
<b>ISCF</b>		
Robotics and artificial intelligence demonstrator	Q1	£6m
Robotics and artificial intelligence collaborative R&D	Q1	£10m
Extreme robotics challenge	Q4 (Feb)	£20m

# Health and life sciences

**Our health and life sciences programme helps businesses to develop and commercialise new products and services that improve health and well-being and ensure sustainable and nutritious food.**

## Introduction

We support UK businesses in tackling some of the biggest global health and food challenges.

World population is expected to grow by more than 2 billion to 9.7 billion by 2050, placing significant demand on our food, health and care systems. An ageing population and increased expectations pose particular challenges.

Global agricultural production must increase by 60% by 2050 to provide safe, nutritious and affordable food for all. Consumer demand will need to be met with finite and unevenly distributed land, energy and water.

The threat from drug-resistant pathogens in humans and animals must be addressed. Type 2 diabetes, cardiovascular problems, some cancers, and respiratory, neurological and liver diseases continue to cause premature deaths.

UK universities carry out outstanding research in health and life sciences. We help businesses to turn this world-class research into the products and processes that address these challenges.

## Challenges and opportunities

Innovators in health and life sciences face significant challenges in getting

the right technology to market quickly and in a way that complies with regulations. It can be particularly difficult for smaller companies when bringing products and services to market for the first time. These challenges mean that technologies requiring substantial capital investment may not provide a return for many years.

There are huge opportunities for businesses that can provide the right solutions. For example, it has been estimated that the global market for cell-based assays in drug discovery, safety, and toxicology alone will reach \$21.6 billion by 2018. The global functional, allergen-free, organic and other healthy foods market is expected to break the \$1 trillion mark for the first time in 2017.

## Our priority areas

We have identified 6 main areas of opportunity where the UK has a strong science base and innovative companies with the ability to capitalise on future opportunities in health and life sciences.

### We will prioritise innovation in the following areas:

- newpreclinical models, technologies and approaches to accelerate new medicines' development – the majority of potential new medicines fail due to poor translation from pre-clinical to clinical studies
- scaling and delivering advanced therapies such as medicines based on cell and gene therapy, and tissue engineering
- precision medicine – tailoring treatments and patient management through personalised diagnoses, to increase efficacy and open up new business opportunities in diagnostics, therapeutics, medical technologies, digital health and direct-to-consumer products
- increasing agricultural productivity through advanced plant and animal breeding technologies, precision engineering and enhancing crop and livestock resilience
- technologies and processes to enhance food quality and availability of safe, nutritious, affordable food including the development of new protein sources, smart packaging and innovative manufacturing processes that deliver food of known provenance
- harnessing bioscience and biotechnology, such as synthetic biology, and bio-data analysis and interpretation, to address opportunities across health, food, and energy

## Funding

### In 2017/18, we will invest up to:

- £24.5 million in competitions that support business projects in our priority areas
- £3 million on an investor partner competition that will accelerate business growth by creating the opportunity for beneficiary companies to receive grant funding and match funding simultaneously
- £8m in a Newton Fund competition on UK-China agri-tech innovation, co-funded with the Biotechnology and Biological Sciences Research Council
- Up to £6m in a precision medicine competition
- £34 million in the Biomedical Catalyst – a funding partnership supported by Innovate UK and the Medical Research Council that helps businesses and researchers to address healthcare challenges
- £25.9 million in the Cell and Gene Therapy Catapult, the Cell and Gene Therapy Manufacturing Centre (opening in 2017) and the Medicines Discovery Catapult (now incorporating the work of the former Precision Medicine Catapult)
- £18.6 million in the network of centres for agricultural innovation – Agrimetrics (agricultural data analysis), the Centre for Applied Crop Science, the Centre for Innovation Excellence in Livestock and the Agricultural Engineering and Precision Innovation Centre.

## Connecting

### We will:

- run an investor showcase event in 2017/18 focused on therapeutics
- hold workshops and brokerage events to encourage UK businesses to compete for the €1 billion available through the Horizon 2020 European programmes in health, demographic change and wellbeing, food security, sustainable agriculture, blue growth and the bioeconomy.

### Success story:

## Protecting grain and reducing pesticide residue

Exosect developed a safe and effective treatment to protect stored grain against infestation, reducing food wastage and also cutting pesticide residues in the food chain and the environment, with the support of a £270,000 Innovate UK grant. They have secured additional funding from a number of sources including the Bill and Melinda Gates Foundation and more than £15 million of private investment from venture capital companies. Pictured is chief executive Martin Brown.

### THE ISCF CHALLENGE:

## Accelerate the manufacture of innovative medicines

Building our  
#IndustrialStrategy

The UK biopharmaceutical sector is already a highly successful and large creator and exporter of innovative medicines and therapeutics. Optimising production processes is a challenge, particularly for smaller companies. We will do more to help innovative firms rapidly move their novel treatments from the laboratory to the bedside.

We will enable businesses to develop efficient production processes for small molecules, vectors, viruses, complex biological molecules and cells.

To deliver this we will create a network of specialist medicines manufacturing innovation centres for each type of therapy. It will allow companies to develop processes beyond laboratory scale, speeding patients' access to new drugs and treatments. Where products have to be processed close to the patient, a small number of advanced treatment centres will also be created in hospitals.

Innovate UK will lead this programme and will work in partnership with the research councils. Funding of £197 million will be made available over the next 4 years for the centres and for collaborative research and development projects, co-funded by business.



## Action plan Health and Life Sciences

Investment	Timing	Budget (up to)
Health and life sciences competitions	Q3 (October) Q4 (January)	£15m £9.5m (joint £19m competition with emerging and enabling technologies)
Biomedical Catalyst	Q2, Q3 and Q4 (July, November & March)	£34m in total
Investment partner competition: health and life sciences	Q1 (April)	£3m + investor matched funding
Newton Fund: UK-China agri-tech challenge	Q1 (June)	£8m including co-funding
Precision medicine competition	Q2 (Sept)	£6m
<b>Catapults and other centres</b>		
Cell and Gene Therapy (CGT) Catapult	Q1 to Q4	£12m
CGT Manufacturing Centre		£6.2m
Medicines Discovery Catapult	Q1 to Q4	£7.7m
Agrimetrics	Q1 to Q4	£2.9m
Centre for Applied Crop Science	Q1 to Q4	£4.2m
Centre for Innovation Excellence in Livestock	Q1 to Q4	£6.5m
Agricultural Engineering Precision Innovation Centre	Q1 to Q4	£5.0m
<b>ISCF</b>		
Digital Health Technology Catalyst R1	Q2 (July)	£8m
Manufacturing new medicines	Q2 (Sept)	£15m
Advanced therapies treatment centres	Q2 (Sept)	£30m
Medicines manufacturing and innovation centre	Q3 (Oct)	£13m
Vaccines development and manufacturing centre	Q3 (Oct)	£66m
Viral vector manufacturing for cell and gene therapies	Q3 (Oct)	£16m
Digital Health Technology Catalyst R2	Q4 (Jan/Feb)	£10m
Medicines manufacturing CR&D R2	Q4 (March)	£10m

# Infrastructure systems

**Our infrastructure programme helps businesses to develop the systems that will make our cities, transport networks and energy supplies better connected and more efficient.**

## Introduction

We support disruptive innovations that create the vibrant communities, integrated transport and sustainable energy that will allow people to thrive in tomorrow's more connected societies. We help UK businesses to develop technologies to deliver more integrated, resilient, efficient, flexible and investable infrastructure.

The UK is well placed to take a global lead with its highly creative businesses and expertise in adopting new ways of thinking and delivering solutions across many areas. The UK is home to major infrastructure companies, innovative SMEs, unique design capabilities and an excellent research base. Strengths include sensing technologies, satellite applications, the Internet of Things, communication technologies, systems engineering, robotics and security, and insurance and finance. The UK's Energy Systems, Future Cities, Transport Systems and Offshore Renewable Energy Catapults provide innovators with the equipment and expertise they need.

## Challenges and opportunities

Frost and Sullivan estimates the UK market in smart infrastructure systems will be worth £8 billion to £21 billion by 2020, and the value of the global market to be \$450 billion by 2025. Despite this, the market for smart, integrated, resilient infrastructure is only now beginning to grow.

Infrastructure is complex, frequently fragmented and capital-intensive. To prove, scale and commercialise new ideas that are reliable and meet standards and regulations is challenging. It means bringing together the many different organisations and businesses working in this area, gaining consumer acceptance for new ideas, creating new value chains, being able to show a return on investment and working with regulators.

## Our priority areas

We will support business investment in new infrastructure technologies and approaches that reach across sectors and disciplines and that bring societal and environmental benefits. We will join cities, utilities and other procurers and investors in infrastructure with those that can provide the solutions to the challenges they face.

### Our 5 priority areas are:

**1 connected transport** – improving transport infrastructure through innovative system design, connecting people and goods through intermodal transport whilst optimising efficiency, and reducing societal costs

**2 energy systems** – to light, heat and power our society in a clean, affordable and secure way. Technologies and services that optimise and integrate an energy system that better meets the needs of users in the most efficient, reliable and cost-effective manner

**3 energy supply** – innovations that lead to significant cost reduction, improved asset integrity and supply chain development for current and future UK and global civil-nuclear and offshore wind markets

**4 urban living** – smart city solutions enabling cities to be viewed and managed holistically, allowing all citizens to be healthier, happier and more productive and resilient

**5 smart, resilient and integrated infrastructure** – connecting cross-sector collaborative approaches with digital design, digital build and manufacturing, and digital operation. This will pave the way for UK firms to develop infrastructure systems fit to drive the fourth industrial revolution

### Success story:

## A new £100 million market

Andy Barr, managing director of Barrnon Ltd, was one of 18 business winners in last year's Innovate UK SME awards. The business developed its Bladecutter technology with the help of an Innovate UK award. The dredging system has been used to remove radioactive sludge in large ponds on historic nuclear sites. Barrnon's award was in recognition of its technology opening up of a worldwide market worth an estimated £100 million.

## Funding

### In 2017/18, we will invest up to:

- £24.5 million in competitions that support business projects in our priority areas
- £10 million on collaborative funding programmes with China, including a focus on cities
- £3 million on an investor partner competition that will accelerate business growth by creating the opportunity for beneficiary companies to receive grant funding and match funding simultaneously
- £6m in Newton Fund competitions on sustainable cities in Malaysia and urban living challenges in China
- £42.5 million in core funding for the Offshore Renewable Energy, Future Cities, Energy Systems and Transport Systems Catapults
- £25 million in core funding for the Energy Research Accelerator, a centre of excellence developing new technologies in the sector

- £3 million in the Energy Technologies Institute, a public-private partnership accelerating the development of low-carbon technologies
- £1.5 million in the Cambridge Centre for Smart Infrastructure and Construction and the SPECIFIC (developing buildings as power stations) innovation and knowledge centres

## Connecting

### In 2017/18, we will run:

- overseas missions in urban living, and cleantech
- 2 investor showcase events focused on sustainable technologies and infrastructure systems
- workshops and brokerage events to encourage UK businesses to compete for the €1 billion available through the Horizon 2020 European programmes in secure, clean and efficient energy, climate action, environment, resource efficiency and raw materials

## Delivery partnerships

The Energy Catalyst is a co-funded grant programme to speed up the global commercialisation of the best UK energy innovation. Innovate UK will run 2 competition rounds with funding from BEIS, the Department for International Development and the Engineering and Physical Sciences Research Council. We will seek applications in any technology and market area that reduces energy cost and emissions and improves energy security.

Innovate UK will run the Digital Built Britain programme on behalf of the Government. It will use intelligent building information models (BIM) to both reduce whole-life costs and carbon emissions of buildings and improve productivity and infrastructure capacity. Digital Built Britain will continue the work of the BIM Task Group and bring together activity in the areas of BIM, smart cities and manufacturing.

We will take a significant role in Department for Transport efforts to deliver innovation in the railways. Innovate UK will run 2 competitions in 2017-18 that aim to deliver real benefits to rail and light-rail customers.

## Action plan Infrastructure systems

Investment	Timing	Budget (up to)
Infrastructure systems competitions	Q2 (July) Q3 (November)	£15m £9.5m (joint £19m competition with manufacturing and materials)
International collaborative funding: China – cities and open (Shanghai)	Q1 (April)	£5m
International collaborative funding: China – cities and open (Jiangsu)	Q1 (April)	£5m
Missions including urban living and clean and cool	Q1 to Q4	£300k
Newton Fund: UK-Malaysia urban innovation challenge	Q1 (May)	£3m
Newton Fund: UK-Guangdong urban innovation challenge	Q2 (July)	£3m
Investment partner competition: infrastructure systems	Q1 (May)	£3m + investor matched funding
<b>Catapults and other centres</b>		
Offshore Renewable Energy Catapult core funding	Q1 to Q4	£12.1m
Future Cities Catapult core funding	Q1 to Q4	£9.5m
Energy Systems Catapult core funding	Q1 to Q4	£10.7m
Transport Systems Catapult core funding	Q1 to Q4	£10.2m
Energy Technologies Institute	Q1 to Q4	£3m
Energy Research Accelerator delivery	Q1 to Q4	£25m
CSIC innovation and knowledge centre	Q1 to Q4	£1.1m + co-funding
SPECIFIC innovation and knowledge centre	Q1 to Q4	£400k + co-funding
<b>Delivery partnerships</b>		
Energy Catalyst rounds 5 and 6	Q1 (May) & Q3 (Dec)	£17m
Digital Built Britain programme (BIM Level 3)	Q1 to Q4	£5m
Accelerating Innovation in Rail 5	Q2 (Sept)	£7.9m

# Manufacturing and materials

**Our manufacturing and materials programme helps businesses to improve their long-term growth and drives productivity across all UK economic sectors.**

## Introduction

Our manufacturing and materials programme aims to drive productivity and growth through the development, validation and application of innovative manufacturing and materials technologies and processes.

Businesses across all sectors can benefit from manufacturing and materials innovation that supports commercialisation of leading-edge products and services at pace and at scale. The manufacturing process and the materials used can be sources of competitive advantage as much as the quality and design of the products themselves. Manufacturing supply chains are complex and global. There are opportunities for value generation along the supply chain, from basic raw materials through to final product. To achieve this, the UK must drive and harness the fourth industrial revolution, in which data will be a critical commodity.

The UK hosts the High Value Manufacturing (HVM) Catapult and many world-class research groups in the private and university sectors. Together, they give the UK a competitive advantage.

## Challenges and opportunities

The UK is the ninth largest producer in the world and accounts for 3% of global manufacturing output. Manufacturing is worth £162 billion to the UK economy. Improving UK productivity could add £30 billion to the economy by 2025 and create 500,000 new jobs.

Companies need to move fast to seize opportunities ahead of the competition. However, a lack of focus on the manufacturing readiness needed to accompany technology and product development is hindering growth. Achieving manufacturing readiness can be expensive and out of the reach of many smaller companies. It also requires additional skills.

## Our priority areas

We will support businesses where investment in manufacturing and materials innovations could provide competitive advantage in multiple markets and where other investment is not readily available due to the high level of technological and business risk.

### These include:

- increasing resource efficiency and flexibility of manufacturing and materials processes for greater resilience to changing supply and demand conditions
- undertaking high-risk, potentially high-impact manufacturing and materials innovation to enable products of the future
- exploiting digital approaches and technologies in manufacturing and materials in new ways
- exploring new ways for manufacturing and materials businesses to offer more value to their customers and open new revenue streams

## Funding

### In 2017/18, we will invest up to:

- £24.5 million in competitions that support business projects in our priority areas
- £8 million in a Newton Fund competition, co-funded by the Biotechnology and Biological Sciences Research Council, on reducing industrial waste and pollution in India
- £88 million in the High Value Manufacturing Catapult

- £8 million in the National Formulation Centre and Graphene Innovation Centre
- £1.4 million in a Newton Fund competition on technology solutions for society and challenges in India

## Connecting

### In 2017/18, we will run:

- an investor showcase event
- hold workshops and brokerage events to encourage UK businesses to compete for

the more than €1 billion available through the Horizon 2020 European programmes in transport and the nanotechnologies, advanced materials, advanced manufacturing and processing, and biotechnology

## Delivery partnerships

Innovate UK is a delivery partner for the Government's investment in automotive and aerospace research. In 2017/18 we will help our partners to deliver a total investment of more than £350 million in these sectors.

We are a delivery partner in automotive research through the Advanced Propulsion Centre (APC) and in aerospace research, development and technology through the Aerospace Technology Institute (ATI).

Our partnership with the Office for Low Emission Vehicles (OLEV) aims for nearly all cars and vans to be zero emission by 2050. OLEV is investing £900 million to position the UK at the global forefront of development of ultra-low emission vehicles. This year will see a focus on a systems approach to electrification, including the start of a vehicle-to-grid programme to improve the consumer experience, smart charging and the facilitation of charging infrastructure. We will also run the 14th competition in the integrated delivery programme (IDP) for ultra-low emission vehicles in partnership with OLEV.

We also work with the Centre for Connected and Autonomous Vehicles (C-CAV) to take forward a comprehensive collaborative research and innovation programme. We aim to strengthen core capabilities, particularly in artificial intelligence, machine vision and machine learning. We are particularly looking to develop new business models to benefit society (for example, mobility as a service).

## Action plan Manufacturing and materials

Investment	Timing	Budget (up to)
Manufacturing and materials competitions	Q1 (May) Q3 (November)	£15m £9.5m (joint £19m competition with infrastructure systems)
Newton Fund: UK-India industrial waste challenge	Q1 (June)	£8m with co-funding
Investor showcases		
Newton Fund: technology solutions for society and challenges in India	Q3 (November)	£1.4m
<b>Catapults and other centres</b>		
High Value Manufacturing Catapult	Q1 to Q4	£88m
National Formulation Centre	Q1 to Q4	£5m
Graphene Innovation Centre	Q1 to Q4	£3m
<b>Delivery partnerships</b>		
Connected and autonomous vehicles UK test bed 1 (C-CAV)	Q1 (April)	£55m
Vehicle-to-grid competition 1 (OLEV)	Q2 (July)	£20m
Advanced Propulsion Centre competition 8 (APC)	Q2 (July)	£35m
Aerospace Technology Institute batch 21 (ATI)	Q1 (May)	<£75m
Aerospace Technology Institute batch 22 (ATI)	TBC	<£75m
Connected and autonomous vehicles competition 3 (C-CAV)	Q2 (July)	£25m
Connected and autonomous vehicles UK test bed 2 (C-CAV)	TBC	TBC
Integrated delivery programme competition 14 (OLEV and ISCF)	Q2 (Sept)	£20m
Advanced Propulsion Centre competition 9 (APC)	TBC	TBC
<b>ISCF</b>		
Faraday Battery Challenge innovation R1	Q2 (July)	£40m
Faraday Battery Challenge manufacture Q2 (July)		£40m
Faraday Battery Challenge innovation R2	Q4 (Feb)	£30m

**Success story:****Brain for driverless cars**

University of Oxford spinout Oxbotica has developed a 'brain' for driverless cars with support from Innovate UK. The autonomous control system called Selenium can work on any vehicle and is already running on Oxbotica's fleet of vehicles, the ESA Mars Rover, and the £8 million GATEway (Greenwich Automated Transport Environment) project in London. It recently won a Financial Times ArcelorMittal Boldness in Business award.

**THE ISCF FARADAY BATTERY CHALLENGE**

**Deliver cost-effective, low-weight, highly efficient and recyclable batteries designed and manufactured in the UK to power the next generation of electric vehicles**

**Building our  
#IndustrialStrategy**

The transition to low-carbon economies worldwide is accelerating fast, and the global market for clean, smart and flexible energy technologies is one in which the UK can lead the world by building on its world-class research and industry in auto and aerospace. Electric vehicles present a significant opportunity for UK industry. The global market for electric vehicle batteries is expected to be around \$25 billion by 2020.

We will establish a new research and development programme for battery

technology, with funding of £246 million over the next 4 years. It will develop and apply research from leading universities to improve on the chemical and safety properties of current batteries. UK automotive businesses will have access to shared facilities to test prototypes in different vehicles and scale and refine them for market.

Innovate UK will lead this programme and deliver it in partnership with the research councils and the Advanced Propulsion Centre.

# Open programme

**Our open programme supports any business undertaking innovation in any technology and any part of the economy.**

## Introduction

Great ideas can come from anywhere and anyone, and often companies need to develop new capabilities in order to grow. Innovate UK supports sectors of strength. However, some world-class UK companies are not part of a larger sector, or have high-potential ideas that are so new that no-one else anywhere is working on them. We are committed to providing innovation support for the best ideas, even if they do not fall within one of the areas we have prioritised.

## Challenges and opportunities

Companies, with innovative, disruptive ideas in particular, can struggle to find the resources needed to overcome the barriers to innovation. A particular challenge can be building and embedding new capability within small companies, especially in newer technology areas where often the expertise lies in academia.

The opportunities presented by new ideas are often not obvious. They sometimes cut across existing boundaries, and many do not have a clear fit in any business sector.

## Funding

### In 2017/18 we will invest up to:

- £53 million in funding competitions open to any businesses with innovative ideas working in any area of technology and any area of the economy
- £31 million in Knowledge Transfer Partnerships, including £6.5 million co-funding, to support the building of new capability in businesses
- £4.5 million in the Eurostars programme to help innovative UK SMEs benefit from global collaboration

## Action plan

Investment	Timing	Budget (up to)
Open programme	Q1 (June)	£15m
	Q3 (Dec)	£19m
	Q4 (Feb)	£19m
Targeted missions in high potential areas	Q1 to Q4	£250k
Knowledge Transfer Partnerships	Q1 to Q4	£31m including co-funding
Eurostars	Q1 and Q3	£5m

# Partnerships

## Strategic partnerships

Last year, we created a new team of regional and national managers. They are building productive relationships with our stakeholders around the UK to ensure the national innovation system aligns to the priorities, excellence and potential of businesses in the regions and devolved administrations.

We continue to work closely with other partners such as the BSI on standards, the national measurements institutes on metrology, the Intellectual Property Office on management of intellectual property for business success and commercialisation of research, and the ScaleUp Institute on scaling up businesses. See page 38 for a list of the key organisations we work with.

### This year, we will:

- explore shared programmes with other countries where there are opportunities to work together to our mutual benefit
- base our regional and national managers close to key business innovation and support organisations across the UK
- help to develop local innovation strategies, including for the North of England

### Success story:

## Winning in Asia

Data specialist Gaist Solutions is helping local authorities manage roads more cost effectively through innovative use of data following a successful Knowledge Transfer Partnership with the University of York. Its turnover tripled in a year and was expected to double again in 2016-17. Managing director Steve Birdsall returned from a connected cities trade mission to India, supported by Innovate UK, with a deal to give the company greater access to the growing infrastructure market in Asia.





## Success story:

### A mission to exploit data

Innovate UK Women in Innovation ambassador Joyeeta Das's big data company Gyana AI features on the 2017 Gartner Cool Vendors list – following in the footsteps of businesses such as Instagram and Dropbox. GyanaAI was introduced to some of its early customers, including NASA, when Das took part in a 2016 space mission supported by Innovate UK. GyanaAI uses artificial intelligence to quickly analyse and categorise data. Its product is now being used by retailers to analyse shoppers' behaviour.

## Delivery partnerships

We deliver a range of innovation programmes in partnership with government departments and other public sector organisations to implement their strategic aims. These are in addition to our sector programmes and are detailed in the relevant sector sections.

SBRI (Small Business Research Initiative) is one of the funding mechanisms we use. It brings together public sector organisations with innovative businesses that can address the challenges faced by government.

A public sector organisation has a problem it can't solve by buying off-the-shelf. Through SBRI it offers an innovative company a development contract and the possibility of their first customer for the product they develop.

We will continue to support and promote the use of SBRI across all parts of government to encourage the public sector to act as a lead customer. A review of the SBRI programme under the government's industrial strategy will recommend ways to generate further business growth. This review is

due to report in 2017, and we will help to take the recommendations forward.

Innovate UK is also a delivery partner for the Government's investment in automotive and aerospace research (see page 30 for details).

## Investor partnerships

We are focusing on developing new ways to help businesses to innovate – by enabling direct private and third sector investment to be made alongside Innovate UK funding in our competitions.

### This will mean:

- investors can invest both earlier and more broadly than before in Innovate UK-supported companies
- funded businesses have increased certainty of ongoing funding, reducing the time spent identifying further finance and creating more time to focus on developing the company
- supported businesses have direct access to commercial acumen and market opportunities



# How we operate

## Business improvement and change

We are constantly trying to improve the way we operate to ensure businesses find it easy to work with us and find what they need.

### In 2017/18, we will:

- enable organisations to apply for funding and manage their projects online in our new 'end-to-end' system
- save money and make ourselves more efficient by replacing our piecemeal data hosting arrangements with a single cloud-based solution

- streamline payments for businesses and clients by transforming the way we manage our financial systems and by starting procurement of a new finance and human resources IT system

## Communications

We will communicate widely to ensure a full range of ambitious and innovative UK businesses take up programmes funded by the new Industrial Strategy Challenge Fund.

Our Innovate 2017 event will be held in Birmingham. It will build on the success of our 2016 event in Manchester that was attended by 2,100 people.

All our communications activities will continue to be heavily digitally biased through the delivery of an audience-driven digital content strategy including YouTube and Twitter.

### Success story:

## Multi-million gene therapy deal

£4 million of Innovate UK funding, including from the Biomedical Catalyst programme, has supported Oxford Biomedica's clinical trials and manufacturing of gene therapy based medicines for Parkinson's disease and corneal graft rejection. The company has agreed a \$90 million deal with Novartis and has further partnership deals with GSK, Sanofi, Immune Design and Green Cross LabCell for use of its gene delivery platform technologies.





**Winners, Women in Innovation:** (Front Row) Elena Dieckmann, founder of AeroPowder, Siobhan Gardiner, CEO of HEROTECH8, Anna Hill, founder of River Cycleway Consortium, Christine Boyle, founder of Senergy Innovations, Carmen Hijosa, Ananas Anam, Dr Rebecca Sage, managing director of Interactive Scientific, Natwilai Utoomprurkporn, founder of Gettrik Ltd, Fanzi Down, founder of DPS Designs, Rachel Gawley, AppAttic, and Dr Shakardokht Jafari, Truelnviso. (Back Row) Emma L Sceats, CEO of CN Bio Innovations, Kym Jarvis, Viridian Consultants, Pauline Dawes, owner of SOMI Trailers, Lorin Gresser, Dem Dx, and Anne Rogues, Aurora Medical, at the Women in Innovation awards at the RSA, London, 15 November 2016

## Customer service

Our dedicated customer support service responds to direct queries within 48 to 120 hours, depending on nature and complexity. The service is growing to meet increased demand. We will support new application platforms to ensure all can access the digital application processes and new competition formats.

## Diversity

We are committed to supporting and encouraging diversity and inclusion in all we do as an investor, partner and employer. In 2016, we launched our first campaign to find, celebrate and nurture the very best talent for innovation in areas currently under represented.

Our first area of focus was on Women in Innovation, to encourage more women with excellent ideas to innovate in UK businesses. Awards were presented to 34 women entrepreneurs, who are now

benefiting from a senior business mentor and a tailored business support programme.

Harnessing the talent of women entrepreneurs could significantly enhance UK economic growth. Recent reports show men are 3 times more likely to own a business with employees and that women are half as likely to start a business.

In 2017/18, we will partner with the Prince's Trust for our next campaign, to encourage and support business innovation by young people who currently face particular challenges due to their background or circumstances. Prince's Trust research shows that 843,000 young people are currently not in education, employment or training in the UK.

We will capture diversity data on applications and projects when our new innovation funding system goes live, and we will set an aspirational 30% target for the representation of women among our assessor pools, monitoring officers and panels.



## Impact and evaluation

Robust evaluation shows that we are getting value for taxpayers' money by directing our activities at the areas where we are most effective at driving UK economic growth and improving productivity. Impact figures indicate that Innovate UK support for business innovation has helped 8,000 organisations, returned up to £16 billion to the UK economy and created nearly 70,000 jobs.

We fund the Enterprise Research Centre, which provides world-class research into SME growth, helping to inform the design and implementation of our programmes. We also partner with Nesta's Innovation Growth Lab in identifying where we can use experimental evaluation to inform programme design and delivery.

### This year, we will:

- evaluate our funding and connecting activities, and conduct impact reviews of the past 5 years of grants

- evaluate the Biomedical Catalyst, Smart and our strategic investments in low impact buildings and sustainable agriculture and food, publishing interim reports as they are completed
- review our Knowledge Transfer Network to inform development of its programme beyond 2018
- begin an evaluation of the Industrial Strategy Challenge Fund

## Training and development

Innovate UK has highly skilled and capable people. We will continue to develop our people to meet our future needs, deliver priorities, and release individual potential.

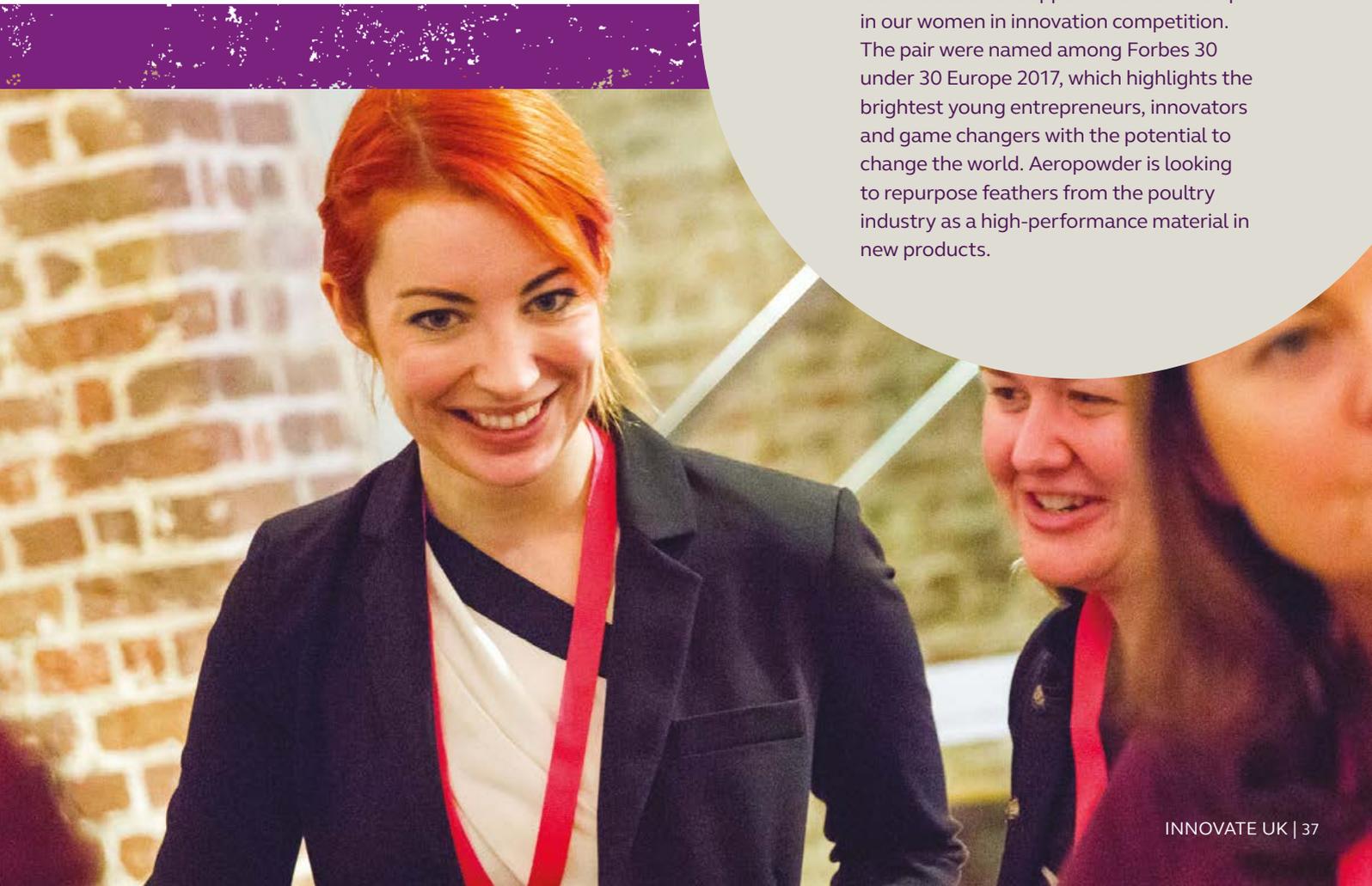
We will be increasing our staffing as appropriate in order to deliver the ISCF. We also plan our second graduate scheme intake in autumn 2017.

We continue to build our activities to support and embed the Innovate UK core values and to ensure diversity and inclusion across the organisation. With significant change ahead, we have a clear approach to ongoing, effective employee engagement.

### Success story:

## Brightest young entrepreneurs

Elena Dieckmann, co-founder with Ryan Robinson of Aeropowder, won £50,000 and tailored business support and mentorship in our women in innovation competition. The pair were named among Forbes 30 under 30 Europe 2017, which highlights the brightest young entrepreneurs, innovators and game changers with the potential to change the world. Aeropowder is looking to repurpose feathers from the poultry industry as a high-performance material in new products.







Innovate UK drives productivity and growth by supporting businesses to realise the potential of new technologies, develop ideas and make them a commercial success.

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