Knowledge Transfer Network

Connecting people to accelerate innovation

Nigel Rix
Head of Enabling Technologies
nigel.rix@ktn-uk.org

Innovate UK
Knowledge Transfer Network

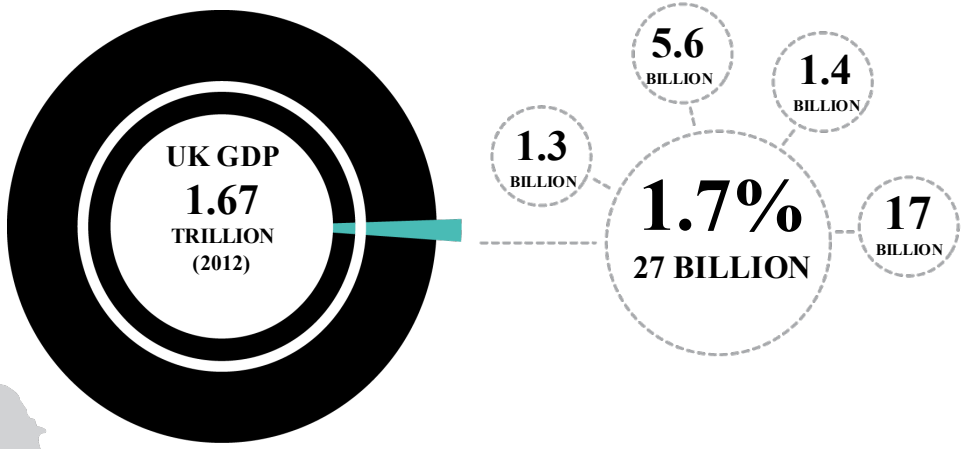
Innovation in the UK

… HOWEVER
consider R&D spend

Global innovation index

15 of the top 20 R&D investors globally have R&D bases in the UK

UK is second only to the US in University rankings



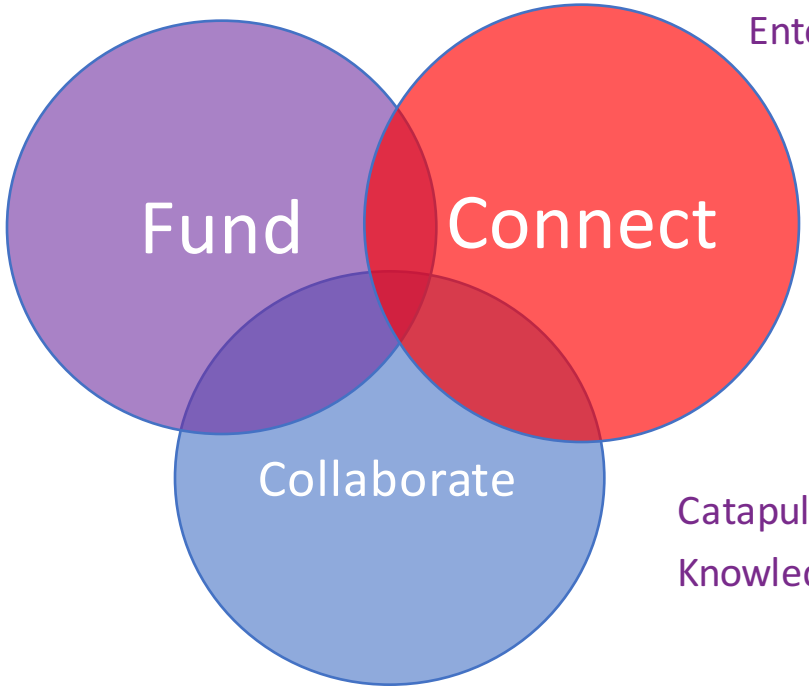
GRANTS DIRECT FROM GOVERNMENT
SCIENCE & RESEARCH BUDGET
R&D TAX CREDIT
BUSINESS SPEND

Israel – 4.25%	Korea – 4.23%	Japan – 3.49%
Sweden – 3.26%	Austria - 3.07%	China – 3.06%
US - 2.79%	OECD – 2.40%	EU – 1.95%

Rank 21st in World according to OECD

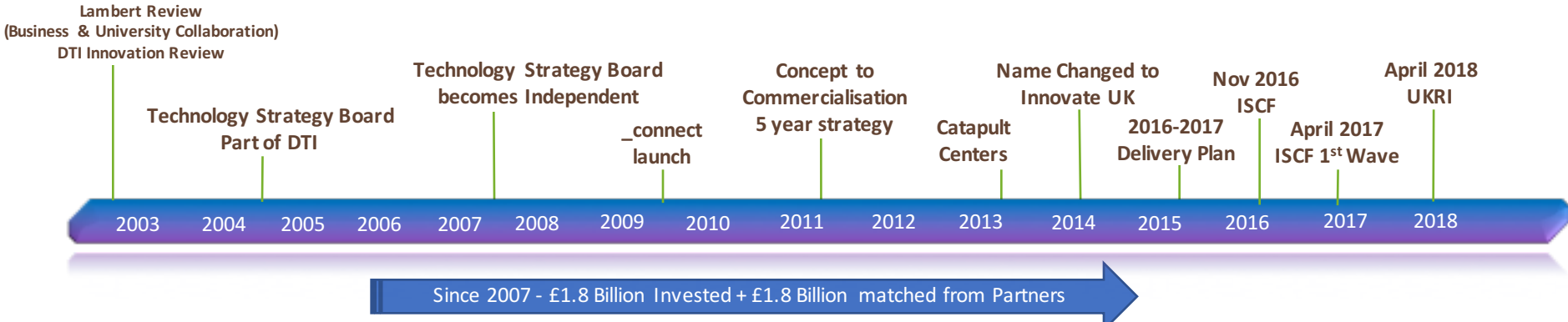
Innovate UK – A History

Collaborative R&D (CRD)
Catalysts
Launchpads
Innovation Vouchers
SBRI
Horizon 2020
Newton Fund



Knowledge Transfer Network (KTN)
Enterprise Europe Network (EEN)

Catapults
Knowledge Transfer Partnership (KTP)

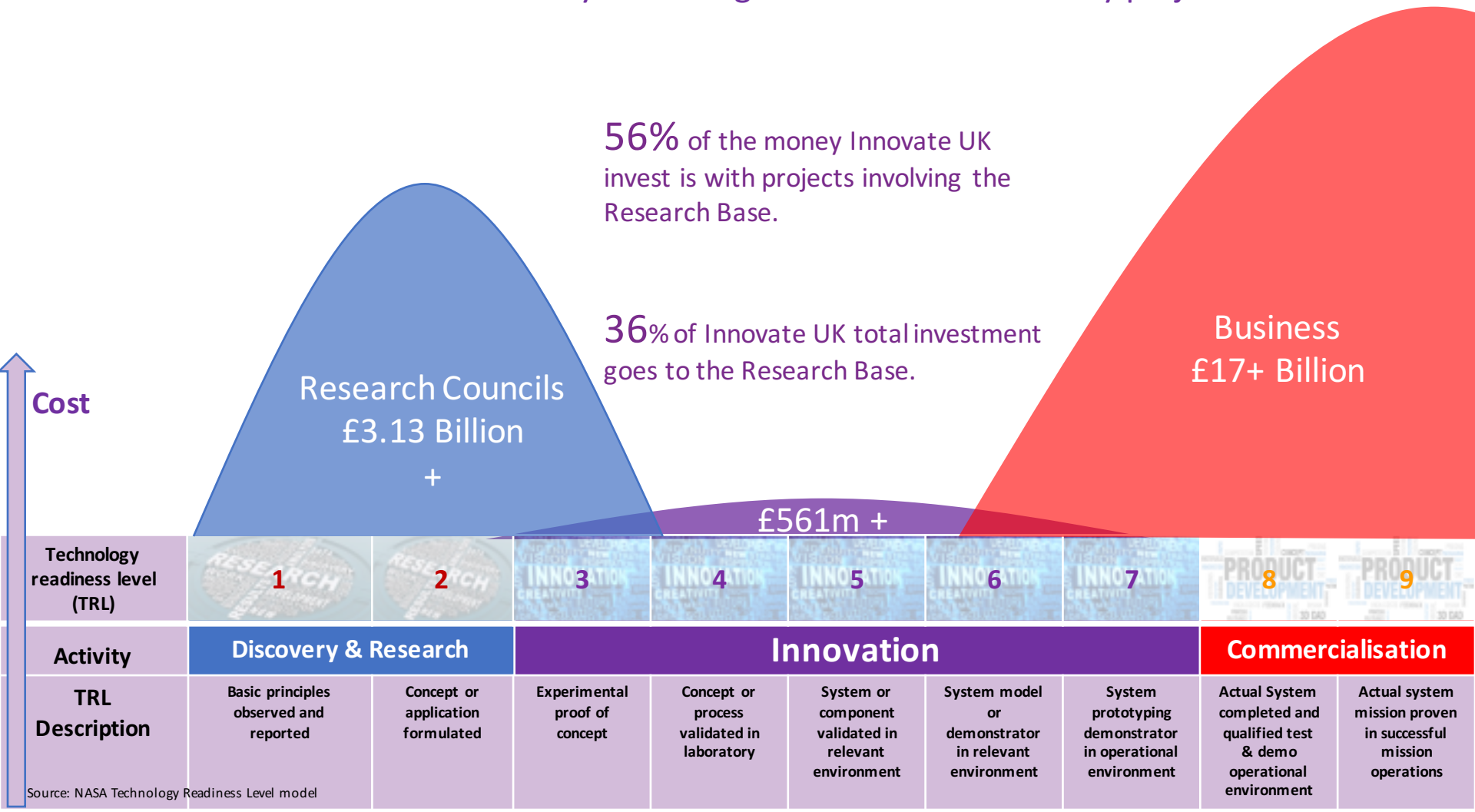


UK Research, Innovation and Development Funding

Innovate UK
"We fund risky technologies - We don't fund risky projects"

56% of the money Innovate UK invest is with projects involving the Research Base.

36% of Innovate UK total investment goes to the Research Base.



Innovate UK - Evolving funding models

Why change?

- Being **more strategic** in delivering innovation support
- Prioritising **grant funding for the riskiest and most complex** innovation activity
- **Learning** from international comparisons

New Additional Innovation Finance Products under consideration:

- Repayable advances
- Innovation loans
- Equity investment

Sector based approach to Industry support

Infrastructure Systems

£150M
2016-17 budget

Jan 2017
Next sector competition closes March ‘17

Health and Life Sciences

£117M
2016-17 budget

Feb 2017
Next sector competition closes April ‘17

Emerging and Enabling

£86M
2016-17 budget

Mar 2017
Next sector competition closes May ‘17

Manufacturing and Materials

£137M
2016-17 budget

~May 2017
Next sector competition

Open Programme

£71M
2016-17 budget

~June 2017
Next sector competition

Competitions schedule includes programmes run with partners – more details on Innovate UK webpage

Knowledge Transfer Network

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Who we are

As Innovate UK's network partner, KTN combines in-depth expertise in all sectors with the ability to cross boundaries. Connecting with KTN can lead to potential partners, horizon-expanding events, and innovation insights relevant to your needs.

We help business to grow the economy and improve people's lives by capturing maximum value from innovative ideas, scientific research and creativity.

Knowledge Transfer Network

- Operates UK wide
- Seek to ensure value is created from every great idea by support companies seeking funding for Collaborative R&D
- Manage UK Innovation Network
  - Connecting the **Unusual** suspects
- Cover all technologies and market sectors

KTN sectors/themes - breadth and depth

creative & digital advanced materials

design energy construction

robotics artificial intelligence

complex systems manufacturing

health infrastructure agri-food

data & trust transport bio-economy

Electronics Photonics Sensors ICT

We seek innovation within and between sectors and technologies

KTN USPs

- *Breath and depth across sectors and technologies*
- *Understanding of markets and route to market*
- *National remit:*
  - *convening and inputting industry needs to government*
  - *Knowledge of innovation infrastructures*

- 125 staff
- 60,000 members
- Free to join

Tools and capabilities

- Network events and workshops
- Newsletters & Reports
- Website – www.ktn-uk.org
- Advice on Access to Funding
- Support for Innovate UK competitions

Case Study – ARM and Iceotope

- **ARM** designs and licenses fast, low-cost, power-efficient RISC processors
- **Iceotope** have liquid cooling technologies for High Performance Computing (HPC)

- KTN introduced them to each other at knowledge dissemination event

- Great timing to fill a technology gap for a H2020 submission, led to an award of €13m
- Looking ahead to future opportunities for collaboration developing key HPC technology

Energy Harvesting Special Interest Group

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Energy Harvesting - previous SIG

- KTN ran an Energy Harvesting Group between 2011 and 2014, its focus was to accelerate UK innovation in the space and encourage the development of technology solutions

- 2 specific funding competitions ran, funding 17 projects

- Focus on Energy Harvesting Technologies etc.
  Several workshops held and reports generated

- **New SIG** will focus on the supply chain by engaging with user communities to identify needs and business opportunities

Energy Harvesting – new SIG

- We will be holding workshops to identify the applications in user markets and opportunities for new business.

- The SIG is led by Simon Yarwood at KTN, please feel free to contact him if you would like to be involved – simon.yarwood@ktn-uk.org

- Another KTN group has produced a report on the Power Economics of Computing, highlighting the low power requirements of EH devices.
- Download a free copy - http://bit.ly/ICTenergyusage

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Energy Harvesting SIG

- Areas of Interest

- **IoT** – the deployment of IoT based systems are still in their infancy but the provision of a power source is one of the critical areas of weakness.
  As the technology platforms mature, potential volume - 30Trillion devices?

- **Sensor Networks** – across all industries sensor networks are increasingly deployed. These require more power than IoT nodes again, EH is critical to thadoption.

- **Home Automation** –subsector of IoT and Sensor Networks ins Home Automation. This is an expanding market for sensors and actuators that, in general, have to be self-powered.

- **Non-contact charging** –increased interest in the ability to recharge batteries without having to connect to a power source from EV to Mobile Phones.
  Proposals have been made for sections of roads to designated charging lanes.

Energy Harvesting SIG

- Call to action

- **Promote**
  Help us highlight the opportunities for Energy Harvesting Technology

- **Engage**
  ”Join” the SIG – KTN website and LinkedIn Group

- **Contribute**
  Articles, news items, discussions, ideas etc.

- **Grow the “sector”**

Emerging and Enabling Technologies Competition Round 2

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Emerging & Enabling Technologies - Round 2

£15 million in new technologies and underpinning capabilities that improve existing industries.

Aim is to inspire the products, processes and services of tomorrow: those with the potential to unlock billions of pounds of value to industry and disrupt existing markets.

Registration deadline – NOON 3rd May 201

Application deadline – NOON 10th May 2017

Emerging & Enabling Priority Areas

There are 4 priority areas:

- Emerging Technologies
- Digital
- Enabling Capabilities: electronics, sensors and photonics (ESPs), robotics and autonomous systems, and creative economy
- Space Applications

Proposals must:

- show significant innovation in one of our priority areas
- show outputs that could be applied in more than one industry, sector or market
- improve business growth, productivity and/or create export opportunities for at least one UK SME involved in the project

Competition details

- Single stage competition

- Supporting total project cost of £35k - £2m
  of duration between 6 months and 3 years
  - Projects under £100k and 12 month duration led by a single SME
  - Projects over £100k awarded to a **consortium** featuring at least one SME

- A project must be lead by either a company or a RTO
- Company may be in up to 3 applications but can only lead 1
- **All projects must involve an SME**

Scope – Emerging Technologies

An emerging technology is one that is still emerging from, or has only recently emerged from, the research base

It disrupts existing markets and leads to new ways of improving our lives as well as sources of wealth generation.

Particularly looking to fund projects in:

- biofilms
- energy harvesting
- graphene and novel single-layer (2D) materials
- cutting-edge imaging technologies
- unconventional new computational paradigms such as biological computing

Scope – Digital

Demonstrate significant development in, or use of, one or more of:

- machine learning and artificial intelligence (AI)
- cybersecurity
- data analytics or ‘big data’
- distributed ledger technology (such as blockchain)
- internet of things
- immersive technology (such as virtual or augmented reality)
- innovative services or applications employing new forms of connectivity, including 5G

Scope – Enabling Capabilities

Electronics, sensors and photonics

Highly innovative projects are welcome from across the range of ESP technologies. Including:

- electronic systems
- large area electronics
- power electronics
- sensor systems
- photonics
- compound semiconductors

Scope – Enabling Capabilities

Robotics and autonomous systems

We are looking for innovations in the following areas:

- service robotics for professional or personal applications
- inspection and maintenance in extreme and challenging (hazardous) environments
- health and social care, including assistive technologies, patient care and robotic surgery
- next-generation farming
- next-generation manufacturing
- autonomous transport, including automotive, aerospace and rail applications
- AI technologies for autonomous systems

Scope – Enabling Capabilities

Creative Economy

We are looking for innovations in the following areas:

- enabling higher-quality, faster and more cost-effective creation, manipulation and/or consumption of 'real time' creative content
- creating richer and more engaging user experiences on new innovative platforms, such as virtual reality

Scope – Space

Proposals must have innovations in at least one of the following areas:

- satellite communications, such as new services or applications using satellite communications infrastructure.
- satellite navigation, such as new services or applications using global navigation satellite system (GNSS) infrastructure.
- earth observation and environmental monitoring services
- market or technical feasibility projects that will lead to future in-orbit service demonstrations

Projects that include development of new satellite instruments or hardware are eligible so long as they have a clear path to exploitation as part of a service or application.

Knowledge Transfer Partnerships (KTP)

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What is a KTP?

- A Knowledge Transfer Partnership is an opportunity for businesses to innovate by accessing the expertise in UK Universities/Colleges and RTOs (the knowledge base) and to embed it in their business for long term benefit

  - It does so by bringing a recent graduate (the Associate) to work for a company on a stretching but specific business improvement project. The associate gets management training and an academic mentor to support the project

- The aim is to embed academic knowledge into companies, transforming businesses through the application of knowledge to create new capabilities resulting in wealth creation

Funding Levels and Position

- 75% of projects are with SMEs
  - 50% employ less than 50 people
  - 15% are micro

- SMEs contribute 33% towards project cost (SMEs receive 66.7% grant funding); large companies 50%
  - Contribution to the KTP budget and top ups is between £20-30k per annum

- Majority of KTPs sit in TRL 5-7 range
- Average project is 26 months in duration (12-36 months possible)
- Highly focussed projects (TRL, Associate role)

KTP Summary

- KTP Project must be **strategic** to the company
- Company > **4 employees**
- Focus on **Innovation**, **Impact** and **Challenge**
- **Wealth generation** & **economic growth** essential
- **95% success rate** in KTP approvals

  from 2000 to date for North of Scotland projects

How the KTN can help

- Advice on project scope and eligibility criteria
- Help with identification of potential partners
  - Industry or academic
- Review of draft proposals
- Information on website
- Build a relationship with relevant KTM

Design Foundations

Investing in great ideas

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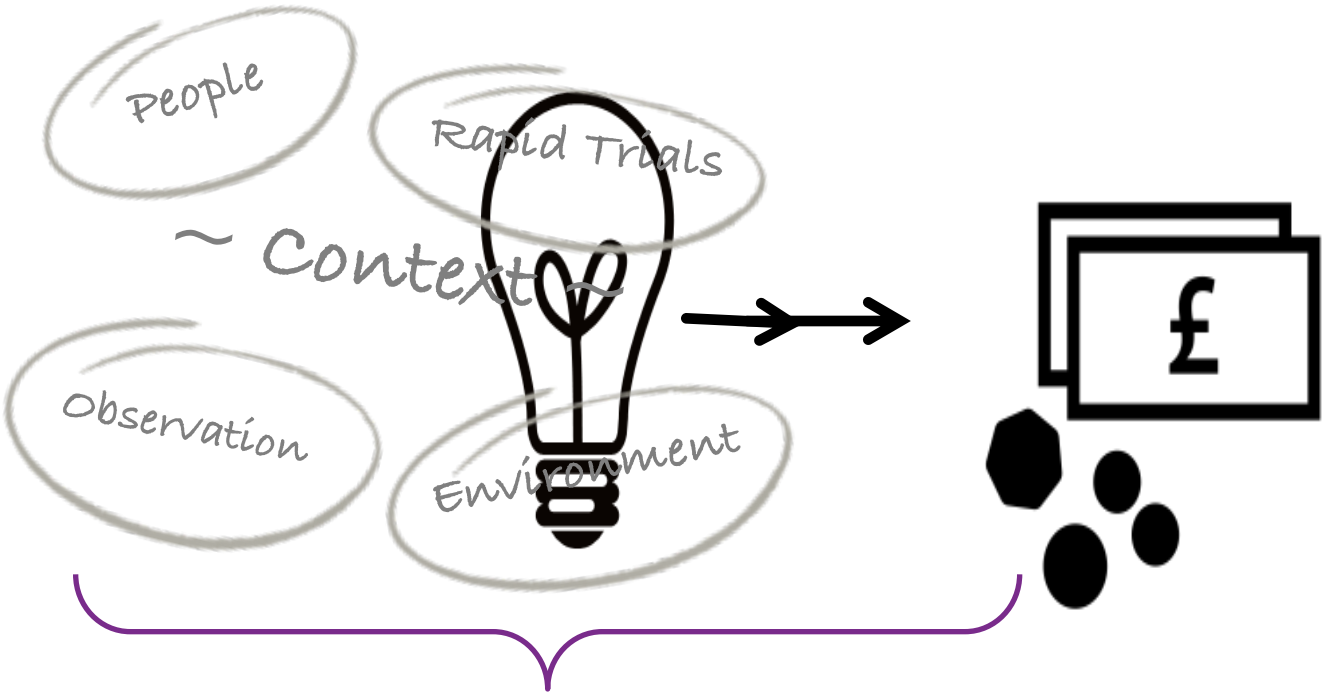
Innovation: "The successful exploitation of new ideas"



How do you generate better ideas?…

…Early-stage **design** thinking

To support projects that:

- Are **early-stage** (don't yet have a fixed idea of the eventual solution) and follow a **human-centered design** process
- Will lead to ongoing **activity** and commercial **value**
- Improve **innovation performance** by boosting design understanding and capability in business
- Represent a **new approach** for the applicant business
- Open sector scope – any sector, any tech, any industry
- For projects of up to a maximum value of £100,000
- Design of physical or digital products, services or business models

Key dates

Design Foundations Round 2	
Competition Opens	8th May 2017
Register online by	Midday 14th June 2017
Application Deadline	Midday 21st June 2017
Design Foundations Round 3	
Competition Opens	14th August 2017
Register online by	Midday 20th September 2017
Application Deadline	Midday 27th Sept 2017

Industry Strategy Challenge Fund (ISCF)

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Industrial Strategy Challenge Fund

Investing in science, research and innovation

We must become a more innovative economy and do more to commercialise our world leading science base to drive growth across the UK.

Industrial Strategy Challenge Fund

- Industry-led and powered by multi-disciplinary research and business: academic collaboration.
- Develop UK industries that are fit for the future, driving progress in technologies where the UK can become a world-leader in research and commercialisation

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Industrial Strategy Challenge Fund (ISCF)

- Part of Government's long-term plan for research and innovation putting them at the heart of industrial strategy
- Delivered by Innovate UK and the Research Councils (UKRI from 2018)
- Help the UK capitalise on its strengths
- Support business led collaborations with coordinated research efforts;
- Identify challenges that may well cut across boundaries of research
- Focus on areas with the potential to transform existing industries and create entirely new ones.

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UK R&D Funding – Additional funding

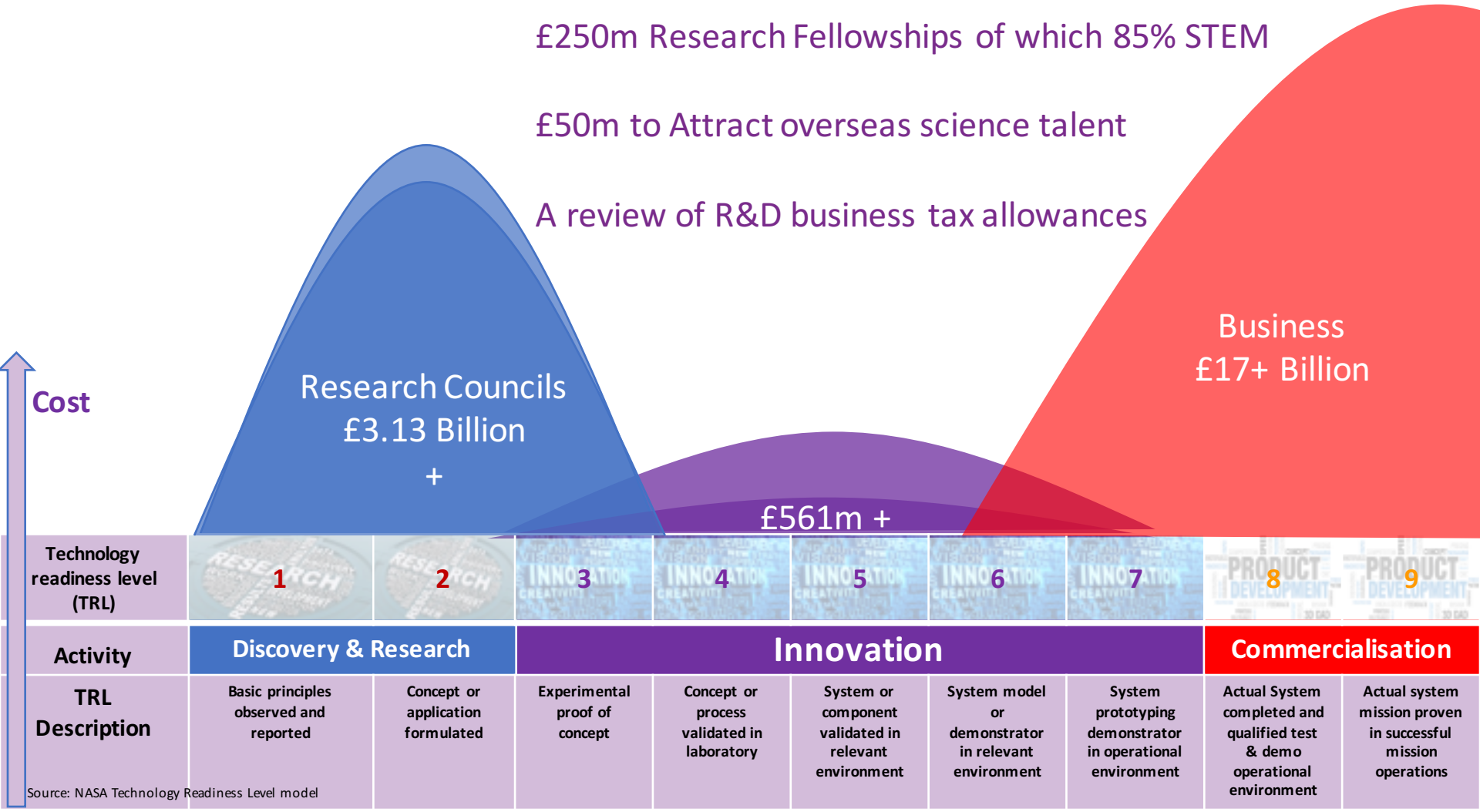
Additional Funding

£270m Research & Development

£250m Research Fellowships of which 85% STEM

£50m to Attract overseas science talent

A review of R&D business tax allowances



Source: NASA Technology Readiness Level model

ISCF - Challenge Areas

Bioscience & Biotechnology	Increase UK self-reliance in food, energy and materials production.
Leading Edge Healthcare & Medicine	Improve patient outcomes through cutting-edge, personalised therapies and new antimicrobials and establish the UK as a world leader in the development and commercialisation of cell and gene therapies.
Manufacturing & Materials of the Future	Ensure that the UK leads the world in the sustainable manufacturing and delivery of the next generation of products and components.
New Energy Technologies	Become the global lead in solving the energy challenge of supplying clean, affordable energy securely to ever more-demanding societies around the world.
Quantum Technologies	To create UK economic wealth, and an economy that works for everyone, by overcoming challenges using next generation quantum technologies in areas such a sub-surface imaging, GPS-free navigation, advanced sensing and communications.
Robotics and Artificial Intelligence (RAI)	To create UK economic wealth, and an economy that works for everyone, by overcoming challenges using RAI technologies in areas such as hazardous environments, autonomous transport, health & social care and advanced decision making with AI.
Space and Satellite Technologies	To create UK economic wealth, and an economy that works for everyone, by overcoming challenges using satellite-based technologies in areas such communications, navigation and earth observation.
Transformative Digital Technologies	To create UK economic wealth, and an economy that works for everyone, by overcoming challenges using digital technologies such as data, AI/ML, cyber security, immersive, HPC, modelling and 5G.
Integrated & Sustainable Cities	Establish the world's best smart city demonstrator, introducing 5G technologies and applications, attracting global mobile companies to the UK.
Technologies for the Creative Industries	To create UK economic wealth, and an economy that works for everyone, by overcoming challenges to anchor and grow the UK creative sector and its contribution to wealth generation and society.

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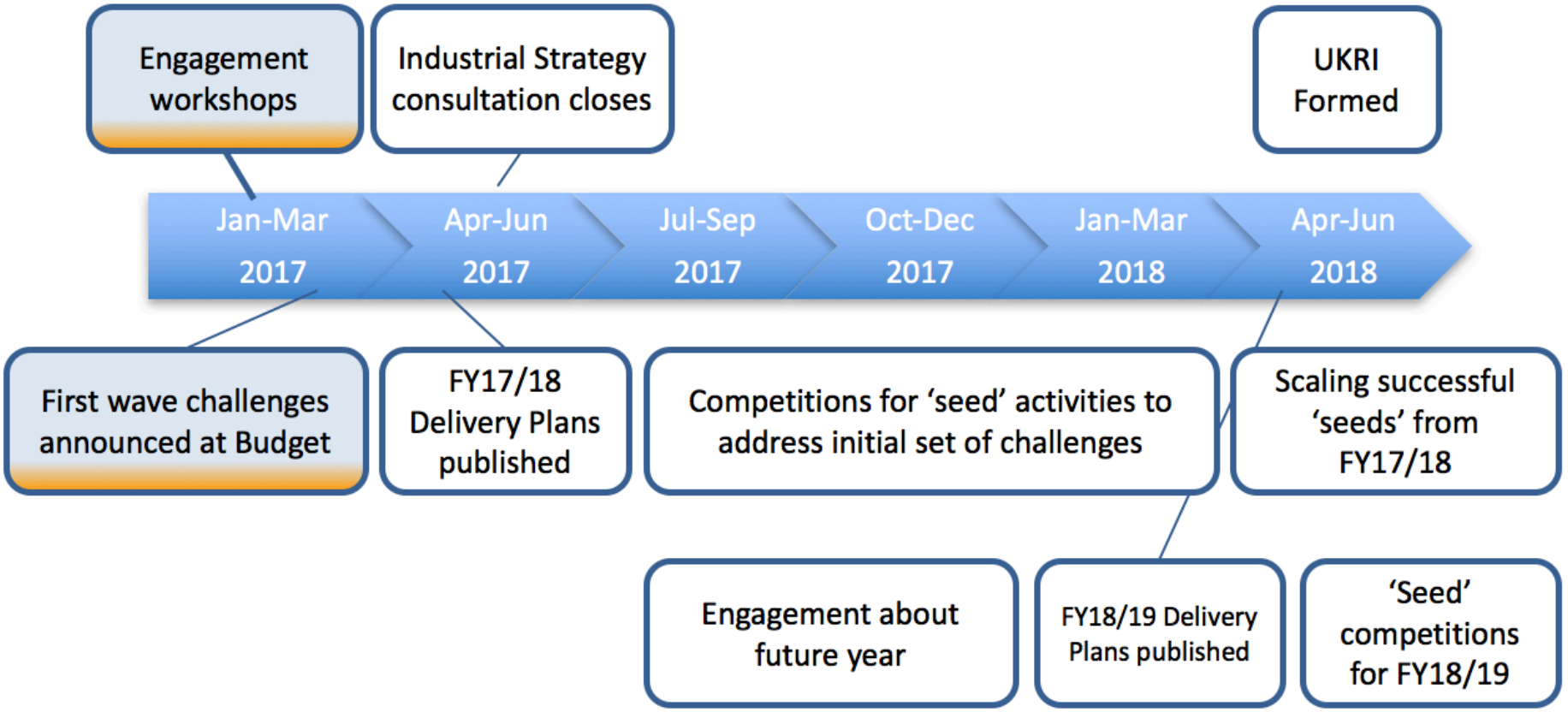
Next steps for ISCF…



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to accelerate innovation

The Future. Faster

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079 123 707 52

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