ENGINEERING AND PHYSICAL SCIENCES RESEARCH COUNCIL

EPSRC Update and Liquid Crystals Discussion

Simon Crook

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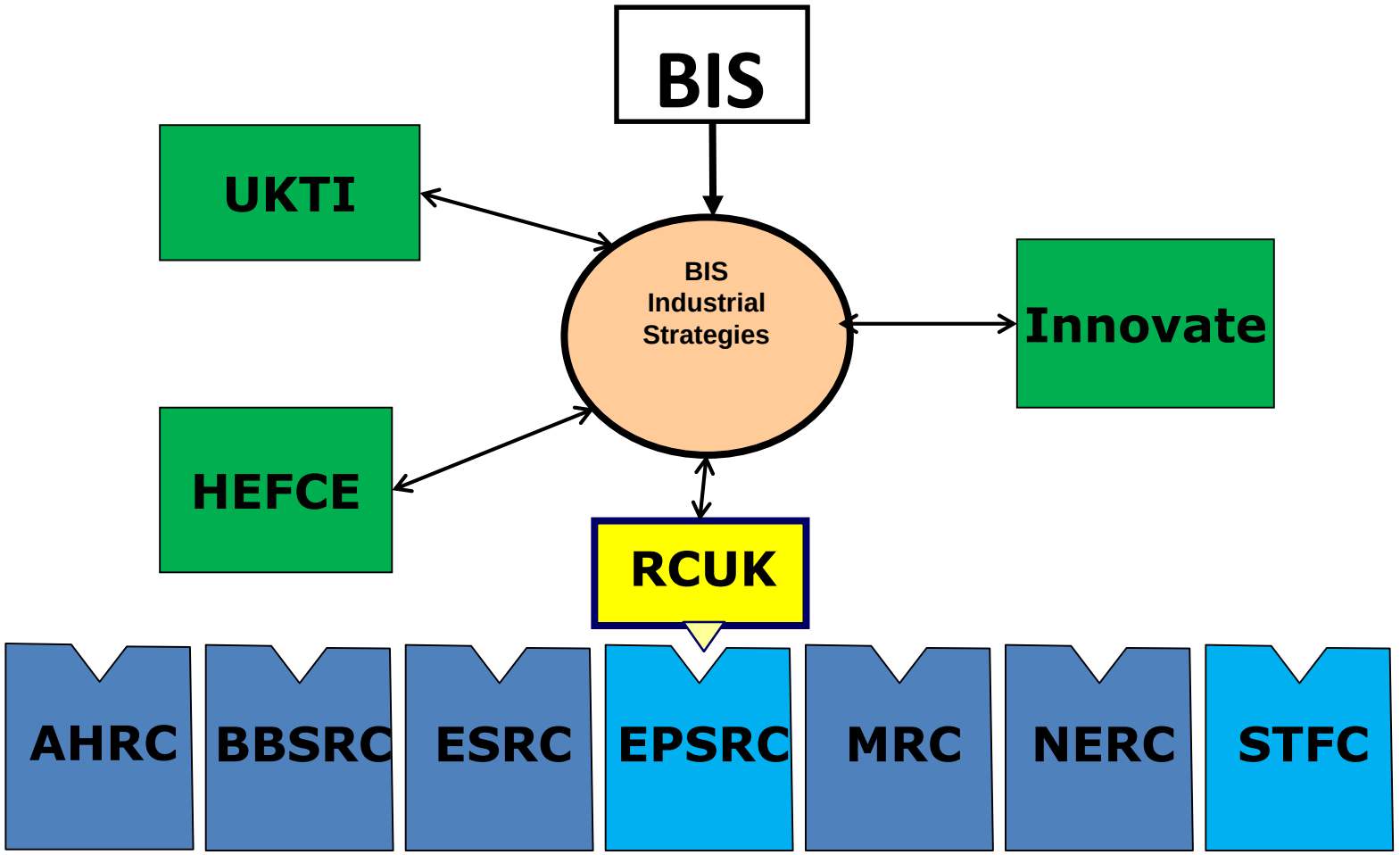
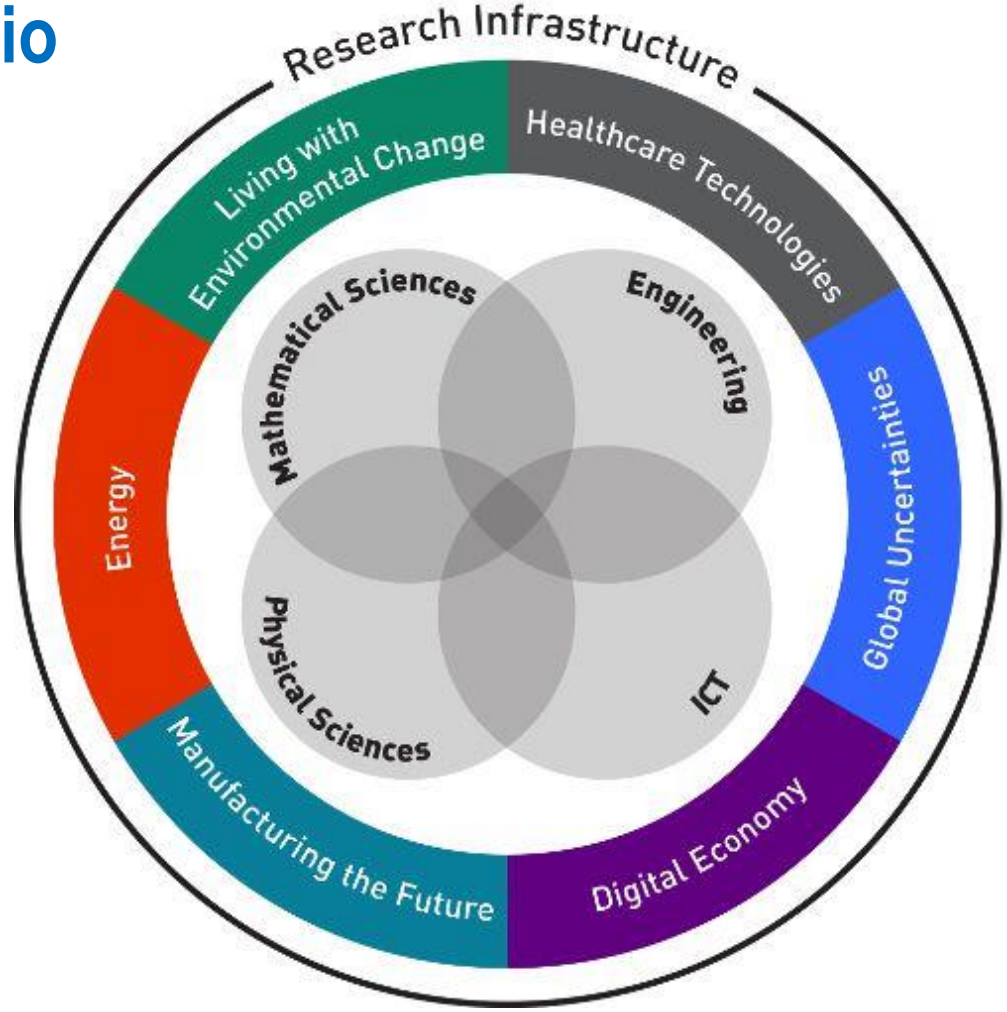
Overview of EPSRC - where we fit in Government



Our Portfolio



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EPSRC & Government - Budget Allocations 2015-16

- Commissioning letter sent to CEO 17 April 2013
- Impact of +10% and -10% and plans for flat cash allocation
- Council no change in Strategic Plan or current Delivery Plan
- Relationship with great Eight Technologies and Industrial Strategies
- Outcome by ~~July 2013~~ actually decided Early 2014 – Flat cash
- Extra £270M announced for Quantum Technologies over 5years – to include National Network of Hubs
- £85M for capital equipment spent early last year, other large capital bids likely and have happened

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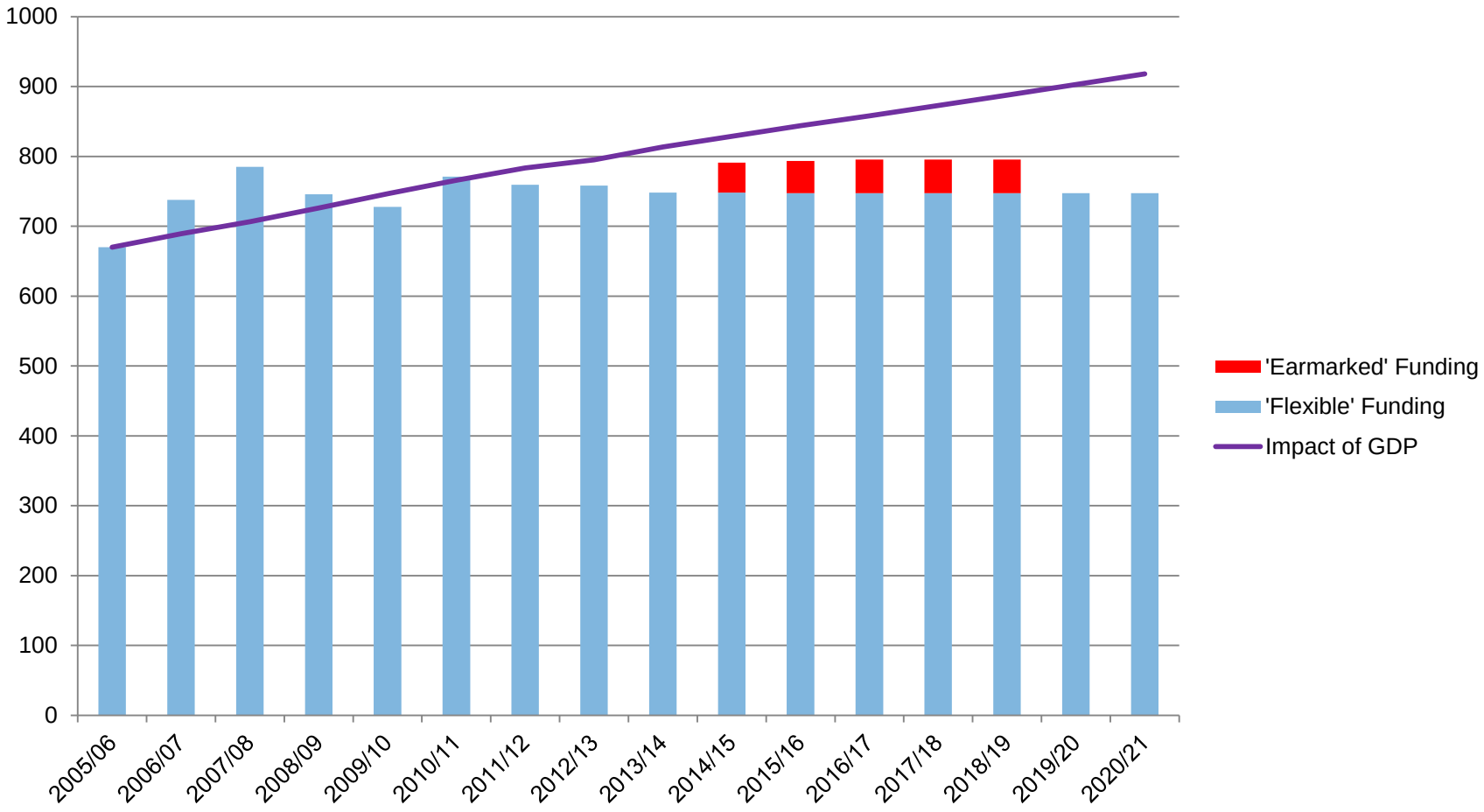
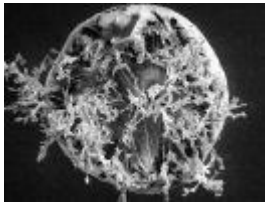
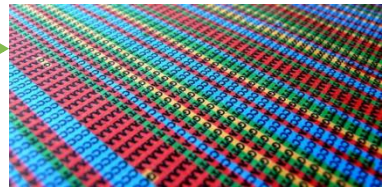
Resource Funding, showing Impact of GDP Inflation



EPSRC – The Research Council for Growth



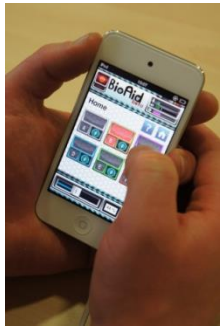
Greater understanding of corrosion to design more efficient and longer-lasting jet engines



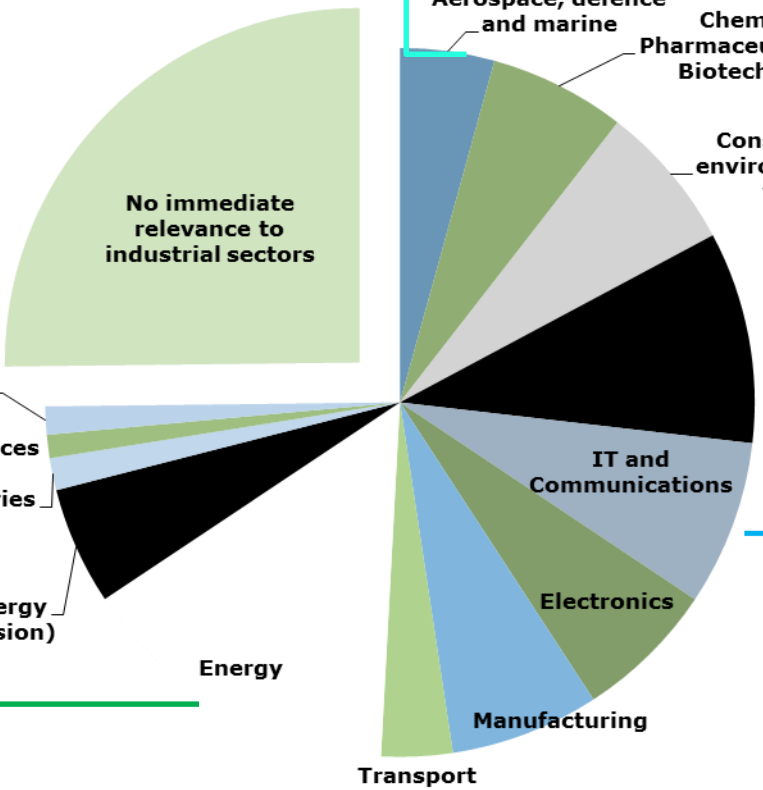
Low-cost DNA sequencing

3D-printing buildings

Wave-energy converter



Hearing aid mobile app



> 70% of EPSRC's £3.7bn portfolio of research and PhD training has clear relevance to key UK industrial sectors

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Recent Government Developments

THE BIS INDUSTRIAL SECTOR STRATEGIES

Early 2013

Aerospace

Nuclear

Offshore wind

Oil and Gas

Spring 2013

Automotive

Information Economy

Education

Agri-tech

Summer 2013

Construction

Professional Business Services

Life Science Strategy Dec 2011

Life Science Strategy one-year-on Dec 2012

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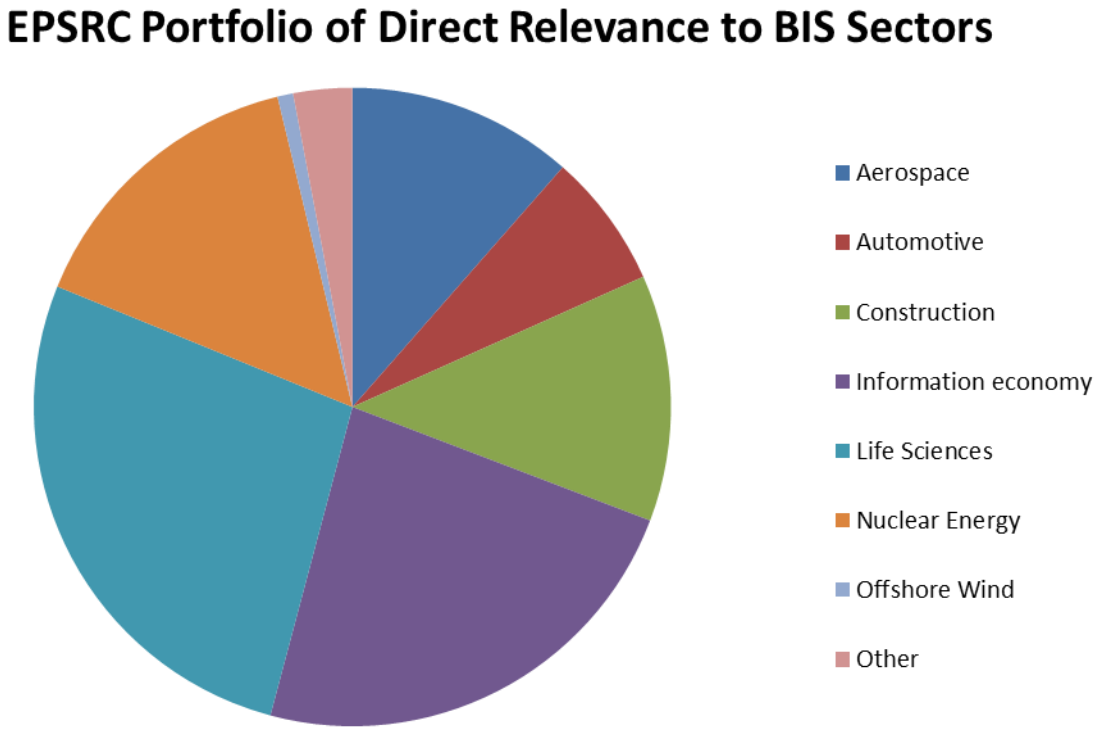
EPSRC – The Research Council for Growth



Over 40% of our portfolio of £3.7Bn is of direct relevance to the 11 BIS Industrial Sector Strategies

EPSRC Centres for Doctoral Training priority areas mapped to the Eight Great Technologies

Advanced Materials (26)	Big Data (23)	Energy (19)
Engineering Sciences	Digital Identity	Engineering Sciences
Materials Technologies	Digitally Connected Citizens	Bioenergy
Process Engineering	New Digital Ventures	Carbon Capture and Storage and Clean Fossil Energy
Structural Integrity & materials behaviour	Autonomous Systems and Robotics	End Use Energy Demand in Buildings, Transport and Industry
Sustainable Built Environments	National Infrastructure Systems	Energy Storage
Healthcare Device Innovation	Digital Healthcare	Hydrogen and Fuel Cells
Therapeutics and Nanomedicine	Medical Imaging	Nuclear
Integrative Technologies	Data to Knowledge	Power Networks
Complex Manufactured Products	High Performance Embedded and Distributed Systems	Solar
Distributed Manufacturing	ICT for Manufacturing	Wind and Marine Energy
Future Industrial Systems	Next Generation Interaction Technologies	National Infrastructure Systems
Innovative Production Processes	Underpinning Communication and Computer Science Training	Power Electronics
Lightweight Systems	Distributed Manufacturing	Sustainable Built Environments
Sustainable Use of Materials	Core Mathematics and its Interfaces	High Performance Embedded and Distributed Systems
Industrially Focused Mathematical Modelling	Industrially Focused Mathematical Modelling	Mathematics of Highly Connected, Real-World Systems
Computational & Theoretical Physical Sciences	Mathematics of Highly Connected, Real-World Systems	Functional Materials
Condensed Matter Physics	Mathematics of Weather, Oceans and Climate	Photonic Materials, Metamaterials & Plasmonics
Functional Materials	New Mathematics in Biology and Medicine	Plasma & High Energy Density Physics
Materials Characterisation	Statistics	Polymer, Soft Matter & Colloid Science
Measurement and Sensing	Computational & Theoretical Physical Sciences	
New Physical Sciences for Biology and Healthcare	Condensed Matter Physics	
Novel and Efficient Chemical Synthesis	Towards Quantum Technologies	
Photonic Materials, Metamaterials & Plasmonics	Engineering Sciences	
Plasma & High Energy Density Physics		
Polymer, Soft Matter & Colloid Science		
Sustainable Chemistry		

Robotics & Autonomous Systems (13)	Regenerative Medicine (10)	Synthetic Biology (8)	Agri-Science (4)	Space (2)
Autonomous Systems and Robotics	Engineering for Life and Health	Engineering for Life and Health	Water	Integrative Technologies
Data to Knowledge	Medical Imaging	Process Engineering	Mathematics of Weather, Oceans and Climate	Engineering Sciences
High Performance Embedded and Distributed Systems	Regenerative Medicine	Synthetic Biology	Novel and Efficient Chemical Synthesis	
ICT for Manufacturing	Therapeutics and Nanomedicine	Complex Manufactured Products	Engineering Sciences	
Integrative Technologies	New Mathematics in Biology and Medicine	New Mathematics in Biology and Medicine		
Next Generation Interaction Technologies	Functional Materials	New Physical Sciences for Biology and Healthcare		
Underpinning Communication and Computer Science Training	Materials Characterisation	Novel and Efficient Chemical Synthesis		
Future Industrial Systems	New Physical Sciences for Biology and Healthcare	Engineering Sciences		
Innovative Production Processes	Polymer, Soft Matter & Colloid Science			
Mathematics of Highly Connected, Real-World Systems	Engineering Sciences			
Measurement and Sensing				
Engineering Sciences				
Healthcare Device Innovation				

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Available funding: £350M

Total value of EPSRC Funding requested: >£1.6bn

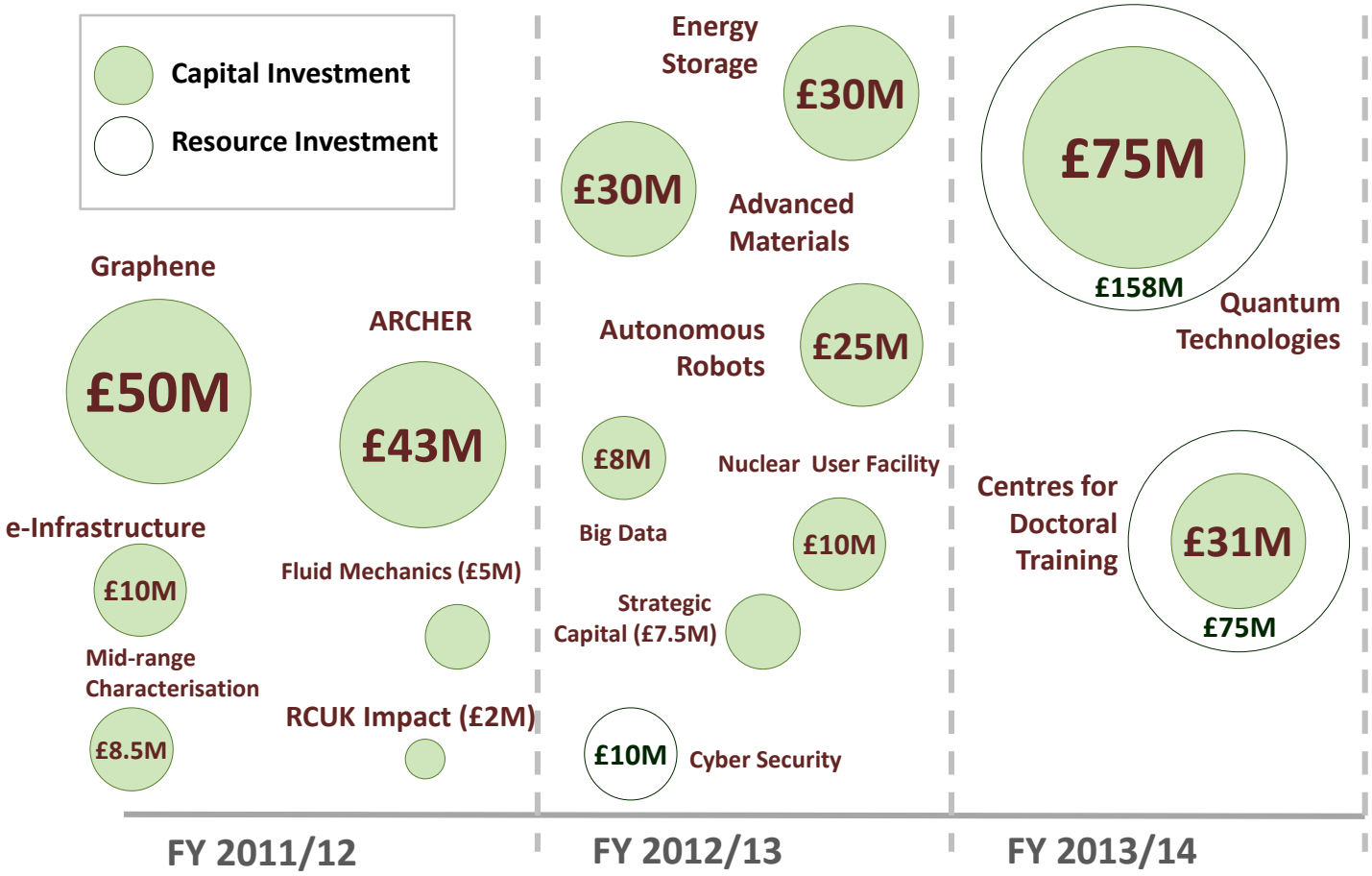
Number of partners involved in outlines: >1500

Number of supporting letters from partners: >2500

Total value of non-EPSRC contributions to Centres: >£1bn

Examples of Industrial partners in 2013 CDT competition

Additional EPSRC budget allocations since 2011



In 2013/14 BIS announced the establishment of the Newton Fund. EPSRC has been allocated £14m of funding over five years.

In March 2014 BIS announced £42m of funding over five years for the Alan Turing Institute that has been formally allocated to EPSRC.

In December BIS invited business cases in 3 large projects and capital clusters including Wind tunnels; NMR; Engineering Structures; NNUF; Xfel; Hartree…

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The Evolving University Ecosystem

- Cost recovery – Matched Funding
- Tuition fees
- The importance of ‘place’
- Shared approaches to ensure efficient use of resources
- Open access
- Shrinking public expenditure

Changing Funding Environment for Materials

Advanced Materials

New Manchester materials centre. Further interest from government in materials in general. In discussion with JSPS for next call with Japan

Materials Grand Challenges

We are looking to announce a number of materials grand challenges, Nigel Birch is leading this for EPSRC

Quantum Technologies

Effectively a new research Theme funded within EPSRC, how do we embed this into full research plans longer term?

Balance of Research!

New funding is great but…..

Liquid Crystal Funding Trends (treat with care!)

Overview

Obtained data for the last 11 years using keywords in titles and abstracts: mesophase, liquid crystal, blue phase, nematic, smectic.

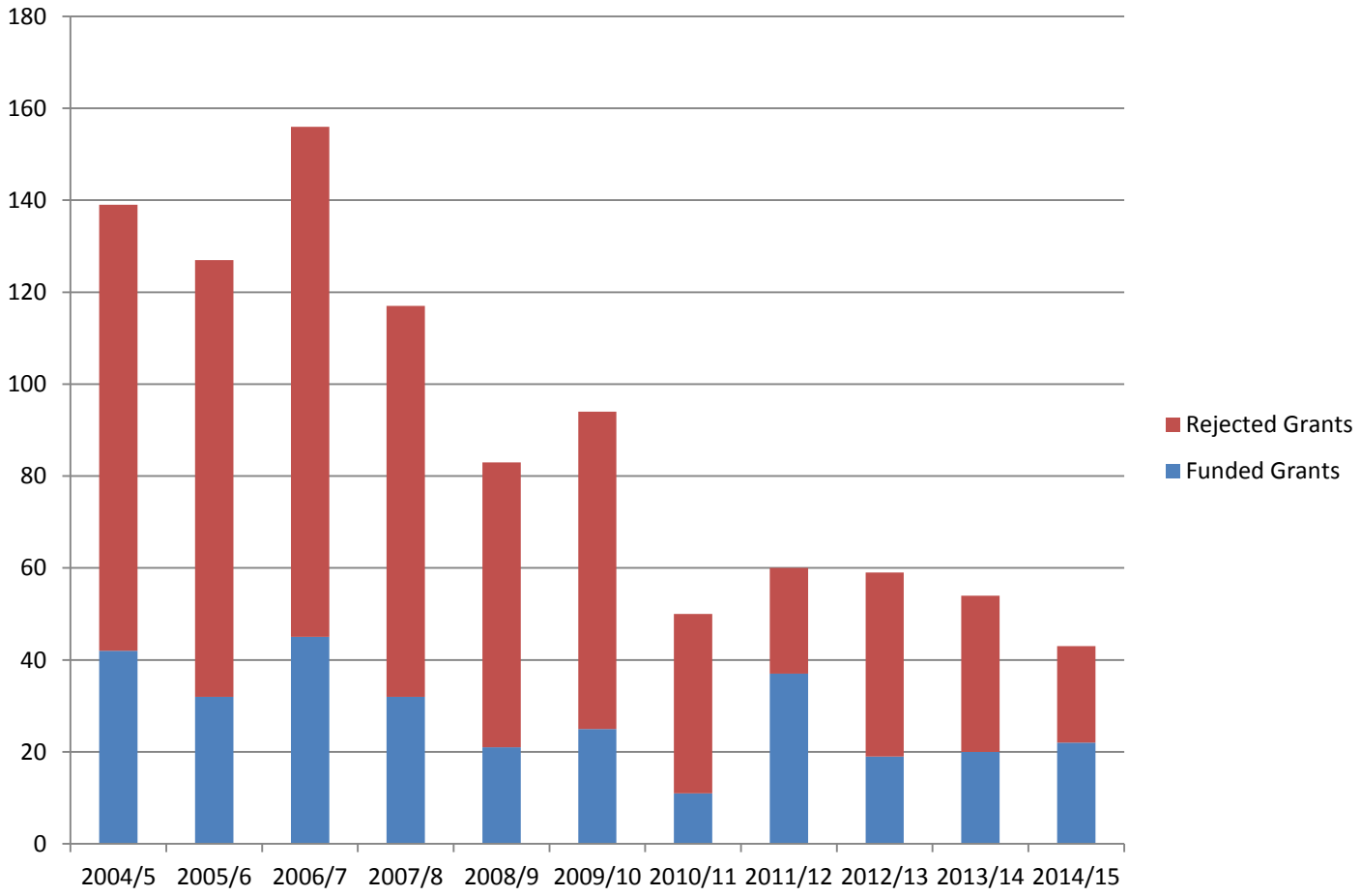
978 applications. 306 funded, 672 rejected (31.3%)
718 were standard/responsive, 505 rejected (29.7%)

First Grants: 69 applications, 25 awarded (36.2%)

Platform Grants: 7 applications,5 awarded
Programme Grants: Involved in 4

Advanced Fellows: 21 applications,**none** awarded
Senior Fellows: 5 applications, 2 awarded
Career Fellows: 19 applications, 6 awarded
Leadership Fellows: 4 applications, 3 awarded

Liquid Crystal Applications by Number



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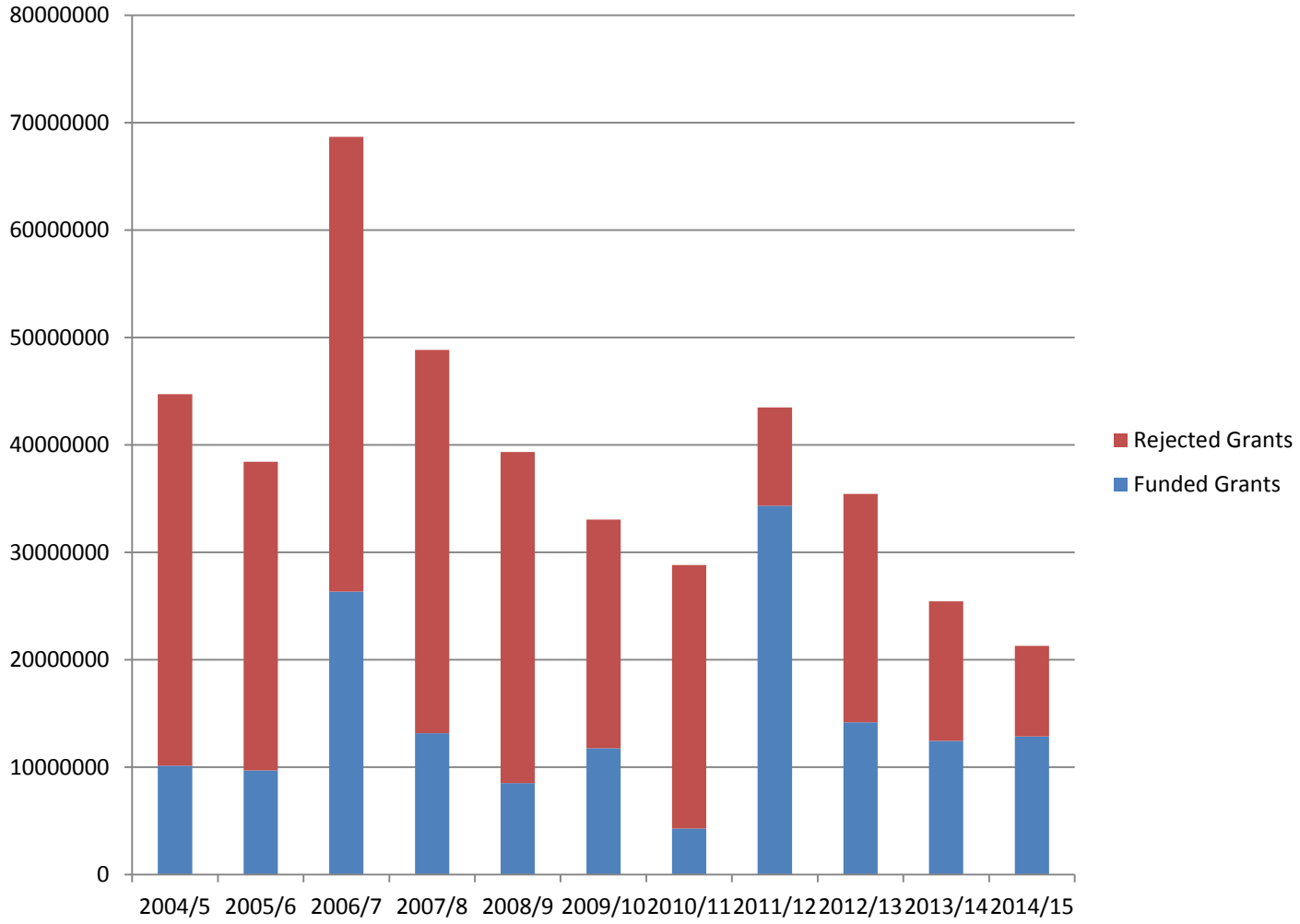
Liquid Crystal Applications by Funds



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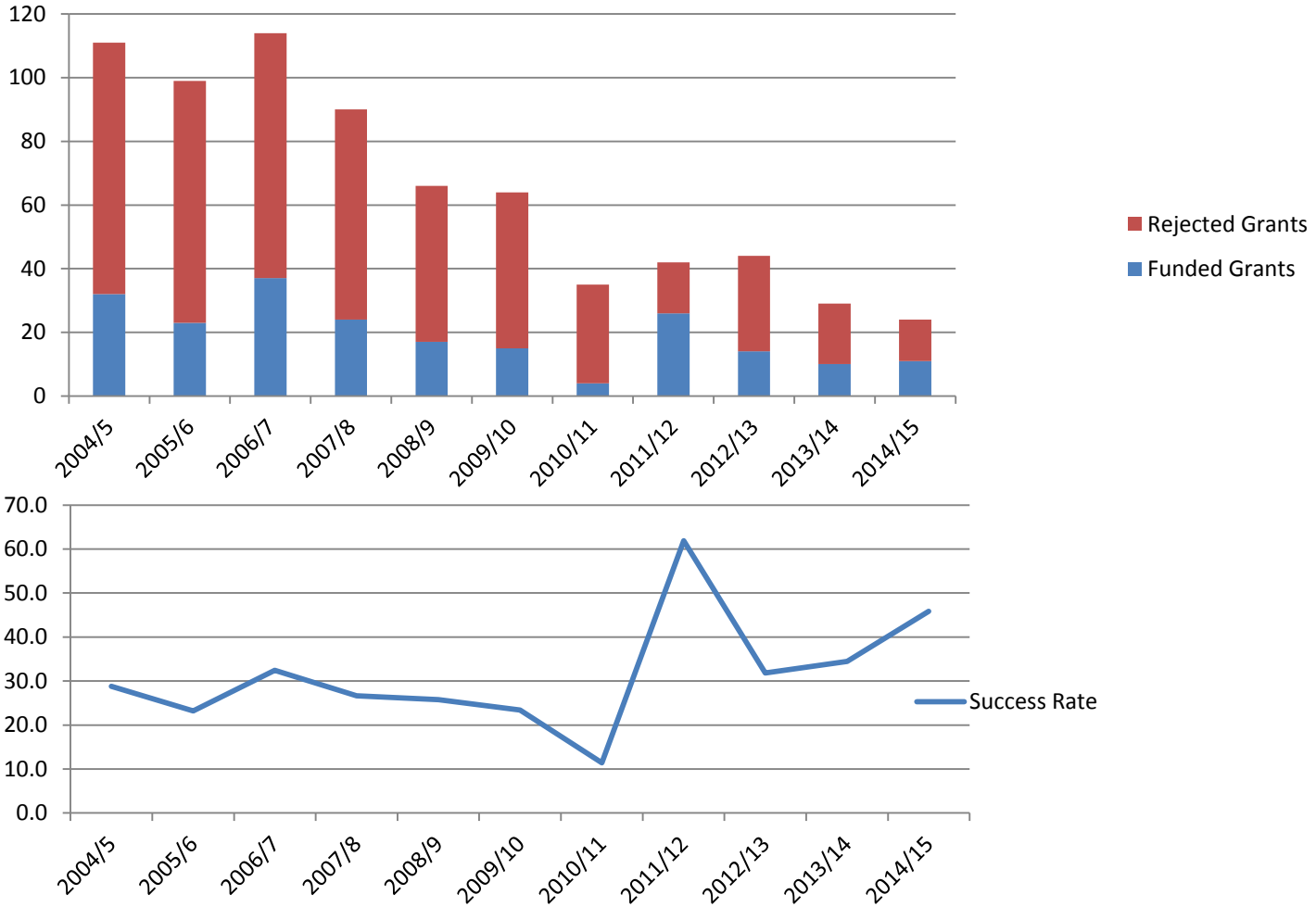
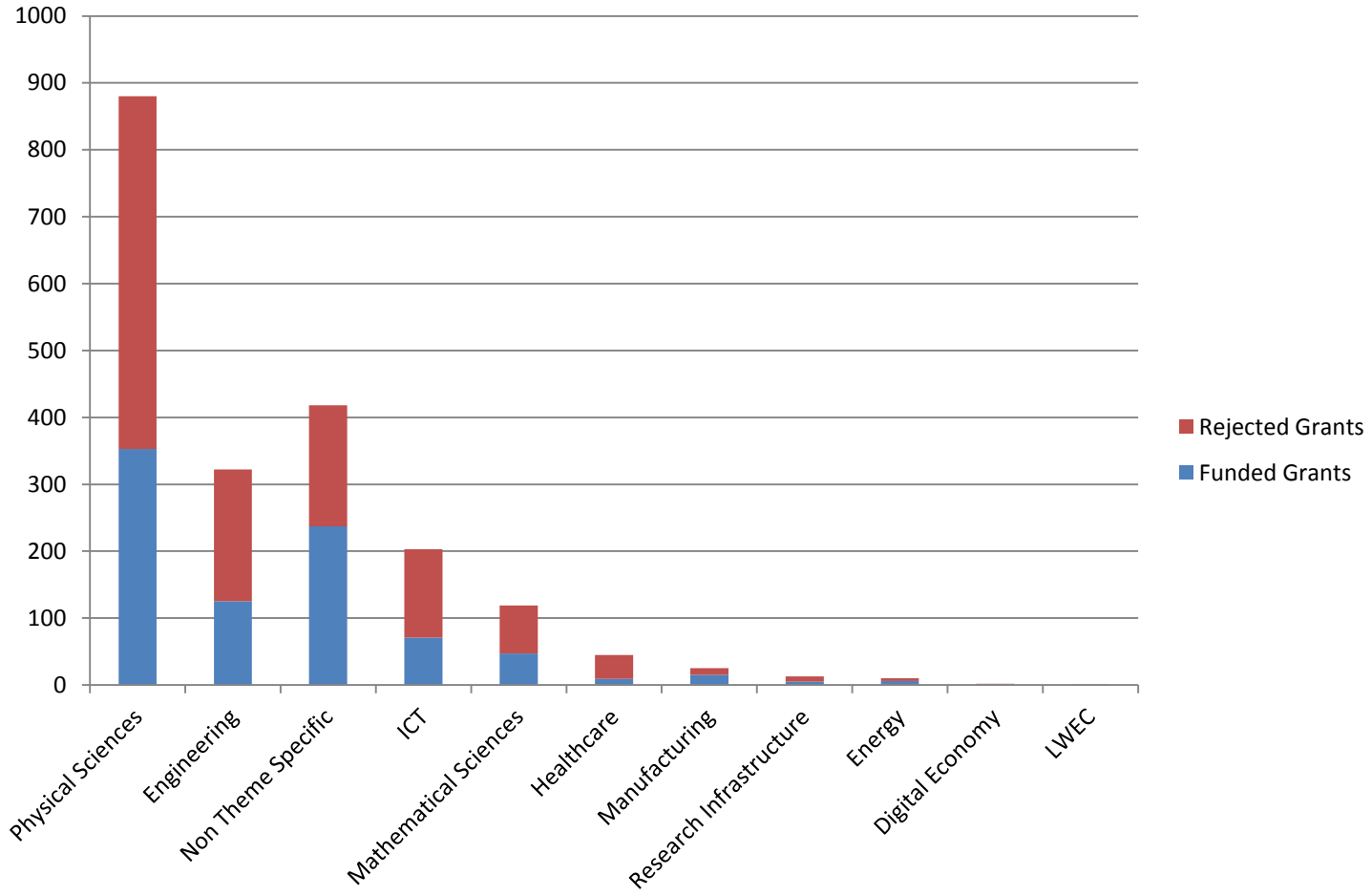
Standard - Liquid Crystal Applications 2004-2015



Liquid Crystal Applications by Theme 2004-2015



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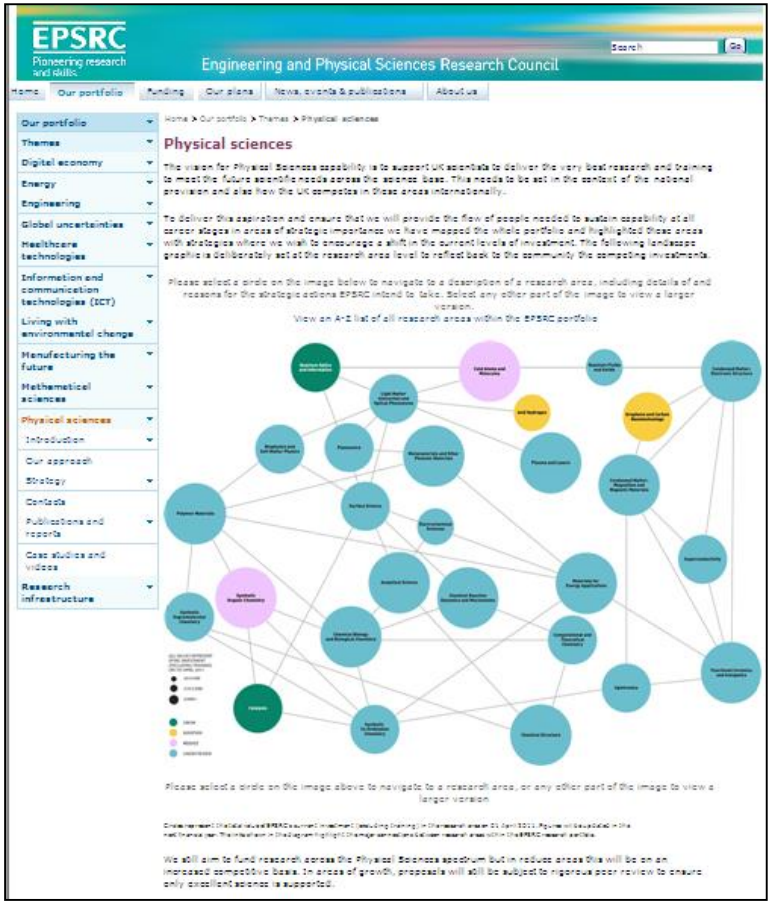
Demonstrating the Added Value of EPS

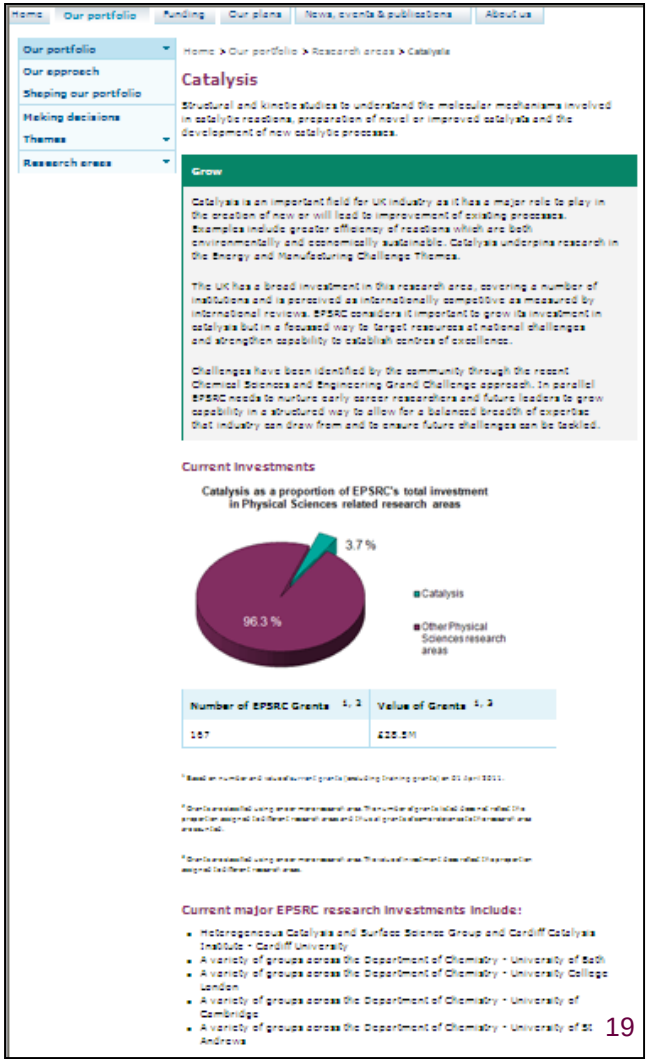
- Elections coming up, new CSR bids, we have to plan as normal!
- What are the big new research areas that Physical Sciences will generate?
- How can we better make the case for the importance of PS underpinning the rest of science and industry
- How can liquid crystals add to the message for the next government? New technologies, impact, new science……

EPSRC portfolio

Overview and analysis of entire EPSRC portfolio

Available at: http://www.epsrc.ac.uk/ourportfolio/Pages/default.aspx





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QUESTIONS

RESEARCH COUNCILS UK

Gateway to research BETA

Key data from the seven UK Research Councils in one location.

Search for and analyse information on publicly funded UK research. Please provide feedback on your experience to gateway@rcuk.ac.uk so we can improve and develop Gateway to Research when the final live system is launched at the end of 2013.

Please enter a search term... Search

gtr.rcuk.ac.uk

What Is a Research Council?

- A non departmental government body holding a royal charter to Fund basic, strategic and applied research.
- Funds come from the public purse.
- Scope is from studentship up to large scale scientific facilities.
- Peer Review is used in grant decision making.
- EPSRC has a budget of around £800M

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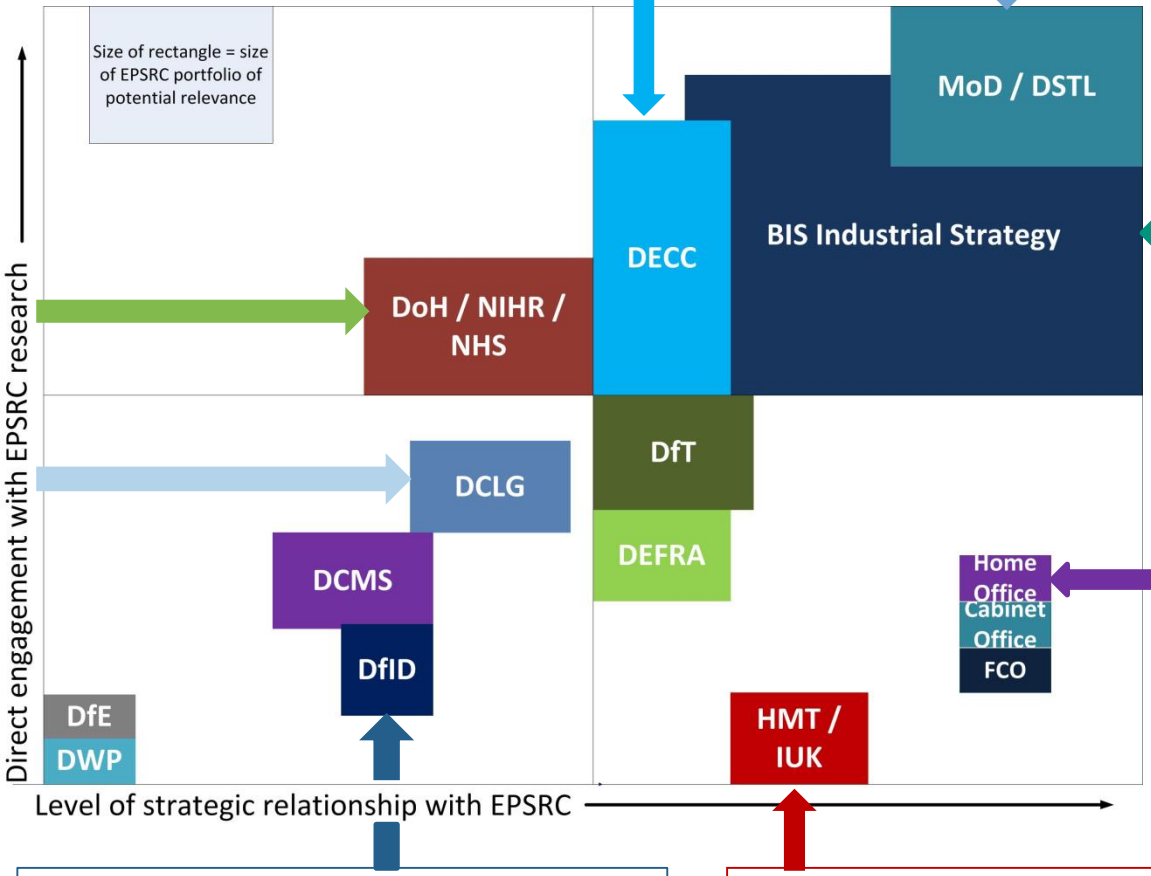
EPSRC – Relationships with Government Departments (it's not just companies!)

UK Carbon Capture and Storage Research Centre (with DECC, TSB, and ETI)

Strategic RCUK relationship led by EPSRC. Partners on >£90M EPSRC research

Digital stethoscope to help GPs spot the first signs of heart disease

Helping '**map the underworld**' of infrastructure without digging up roads – more than 60 partners including local authorities



Industrial Strategy: providing input and coordinating expert advice on key sectors

Cyber Security CDTs: developing talented people able to handle complex and dynamic cyber threats

£40 hand-held antenatal scanner could save the lives of women and children around the world

Infrastructure Business Models research centres announced in the National Infrastructure Plan

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