UK Research Council Experiences in the Evaluation of Economic Impact

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Context

Department for Innovation, Universities and Skills (DIUS)

bbsrc
biotechnology and biological sciences research council

Science & Technology Facilities Council

E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL

EPSRC
Engineering and Physical Sciences Research Council

RESEARCH COUNCILS UK

NATURAL ENVIRONMENT RESEARCH COUNCIL

Arts & Humanities Research Council

MRC Medical Research Council

Leading science for better health

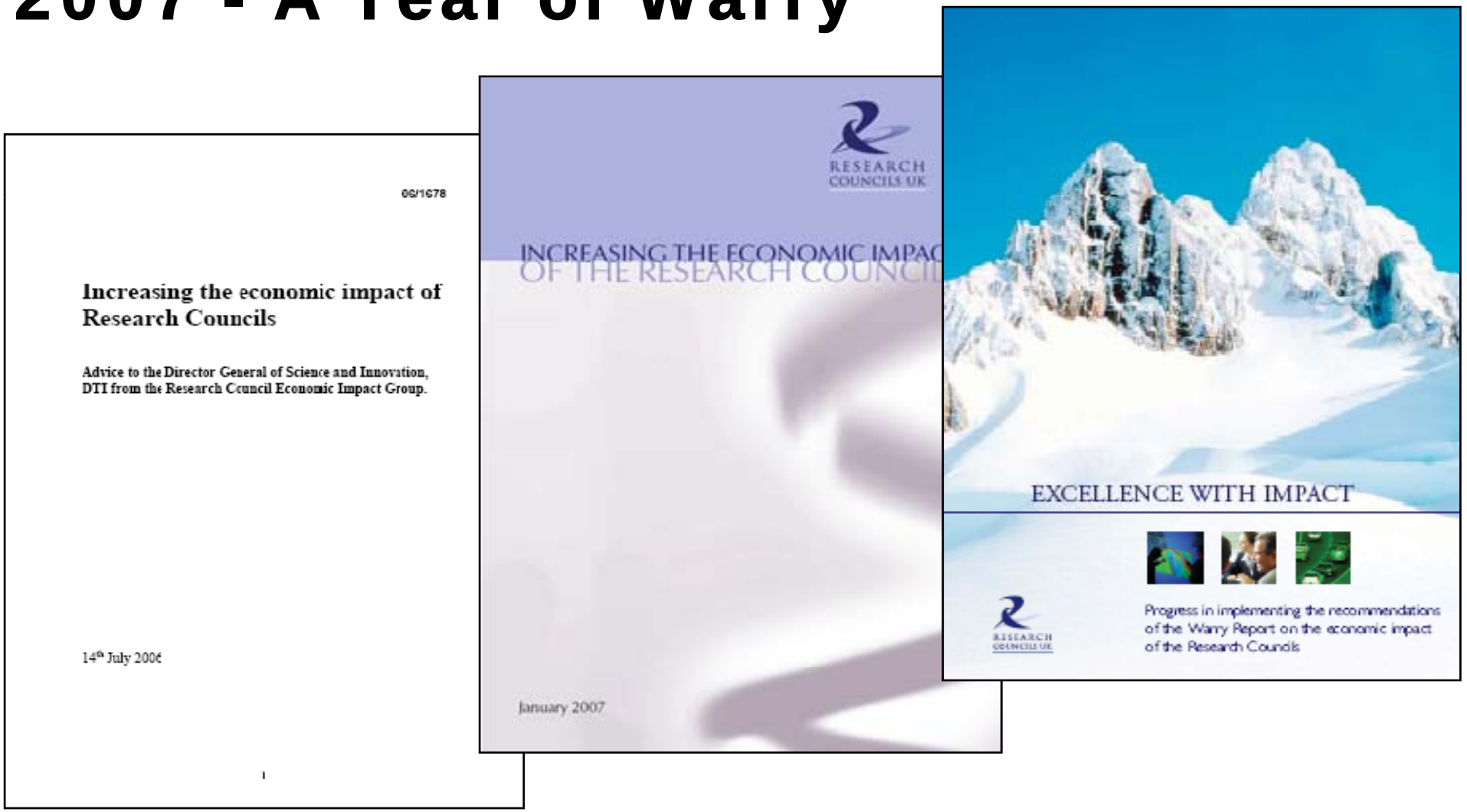
The first DIUS strategic objective is to:

"Accelerate the commercial exploitation of creativity and knowledge, through innovation and research, to create wealth, grow the economy, build successful businesses and improve quality of life"

EPSRC Purpose: Charter

- Support high quality basic, strategic and applied research, and related postgraduate training
- Advance knowledge and technology to meet the needs of users and beneficiaries
- Thereby contribute to the UK's continued economic competitiveness and quality of life

2007 - A Year of Warry



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Increasing the economic impact of Research Councils

Advice to the Director General of Science and Innovation, DTI from the Research Council Economic Impact Group.

14th July 2006

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RESEARCH COUNCILS UK

INCREASING THE ECONOMIC IMPAC
OF THE RESEARCH COUNCI

January 2007

EXCELLENCE WITH IMPACT

RESEARCH COUNCILS UK

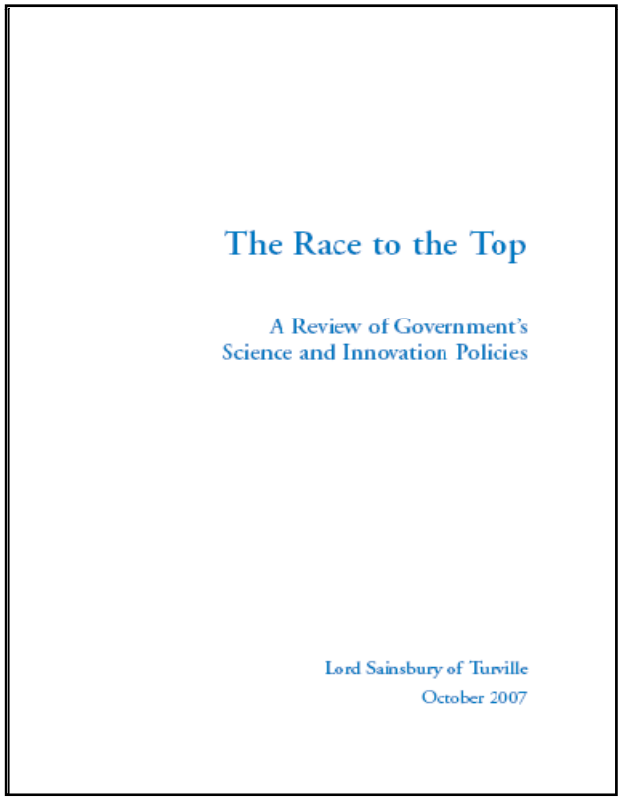
Progress in implementing the recommendations of the Warry Report on the economic impact of the Research Councils

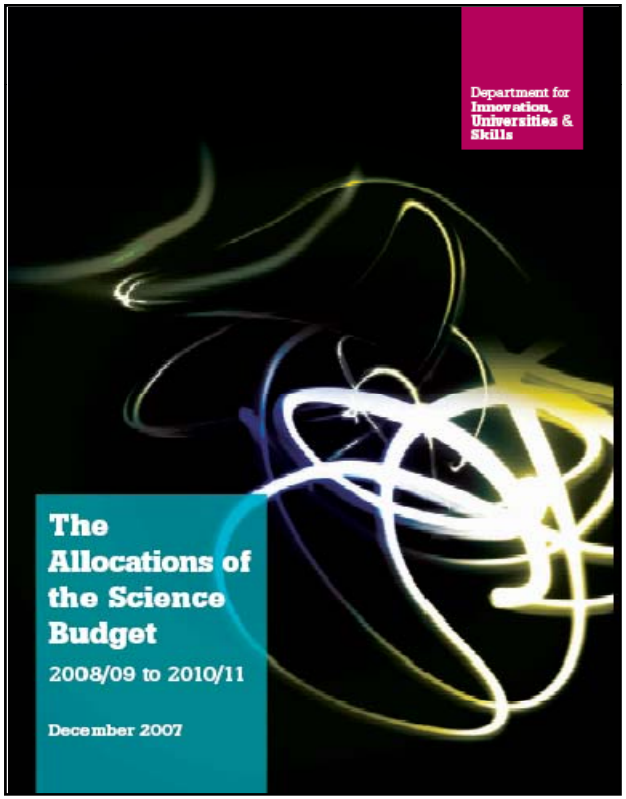
Excellent Research With High Economic Impact

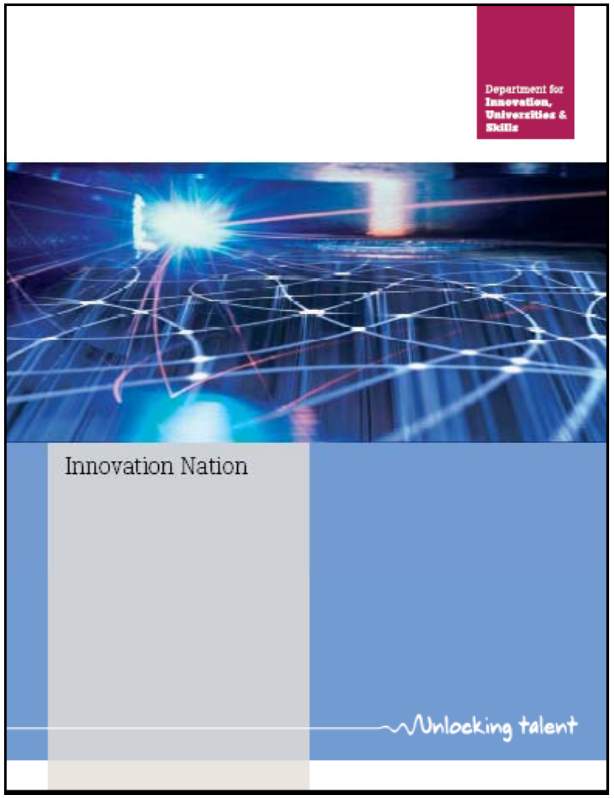
- Defines '*RCUK centre of gravity*'

- Delivered through:
  - Multidisciplinary research programmes
  - Partnerships
  - Business processes (e.g. peer review)
  - Consistent message to research and user communities
  - Understanding and demonstrating impact

New Contexts – Same Messages!







A Causal Relationship!

Increased investment in research and training

↳ Increased expectations of benefits from research and training

↳ Increased obligation to ***demonstrate*** a greater impact from research and training

Towards Better Exploitation Delivery Plan, 2008-2011

Key EPSRC objectives:

- Accelerate research exploitation
- Mission programmes with key stakeholders
- Increase targeted, user-focused PhD training
- Enhance knowledge and people flow through partnerships and funded initiatives
- Publicise opportunities for and successes in KT

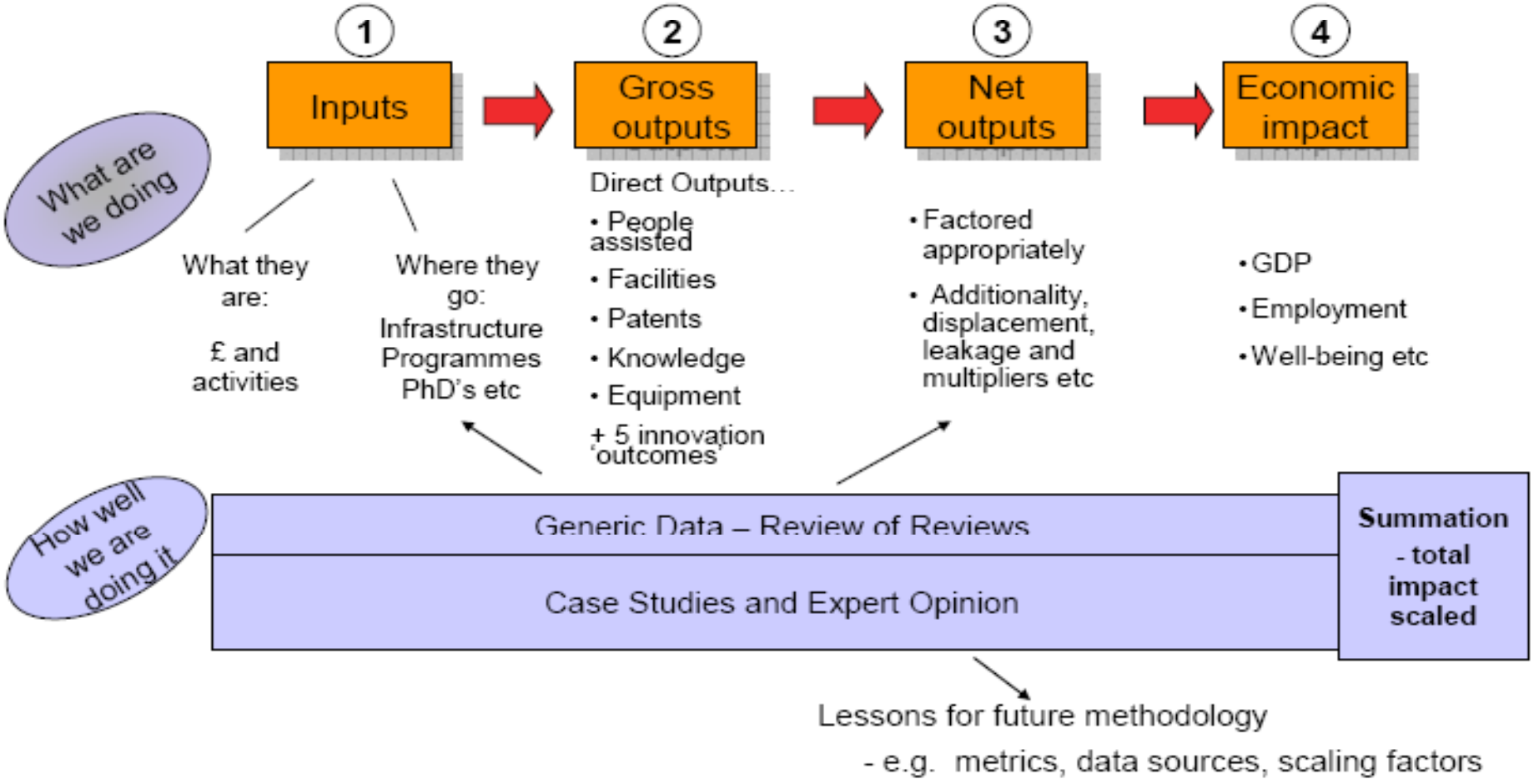
Demonstrating Economic Impact – The Story so Far …

Demonstrating Economic Impact

- Economic Impact Study - PA Consulting/SQW. Various reports - Oct 2007/Jan 2008.
- User Satisfaction Survey – PWC, Sept 2007.
- Knowledge Transfer Categorisation and Harmonisation – DTZ, Sept 2007.

Economic Impact Study - PA Consulting/SQW

- RCUK commissioned PA/SQW to undertake a "baseline" economic assessment of the UK Research Councils and develop a methodology for ongoing assessment.
- Conceptual, methodological and practical difficulties were **not** overcome.
- Much empirical data gathered (via case studies, review of data sources and published literature).
- Clarified need for output data.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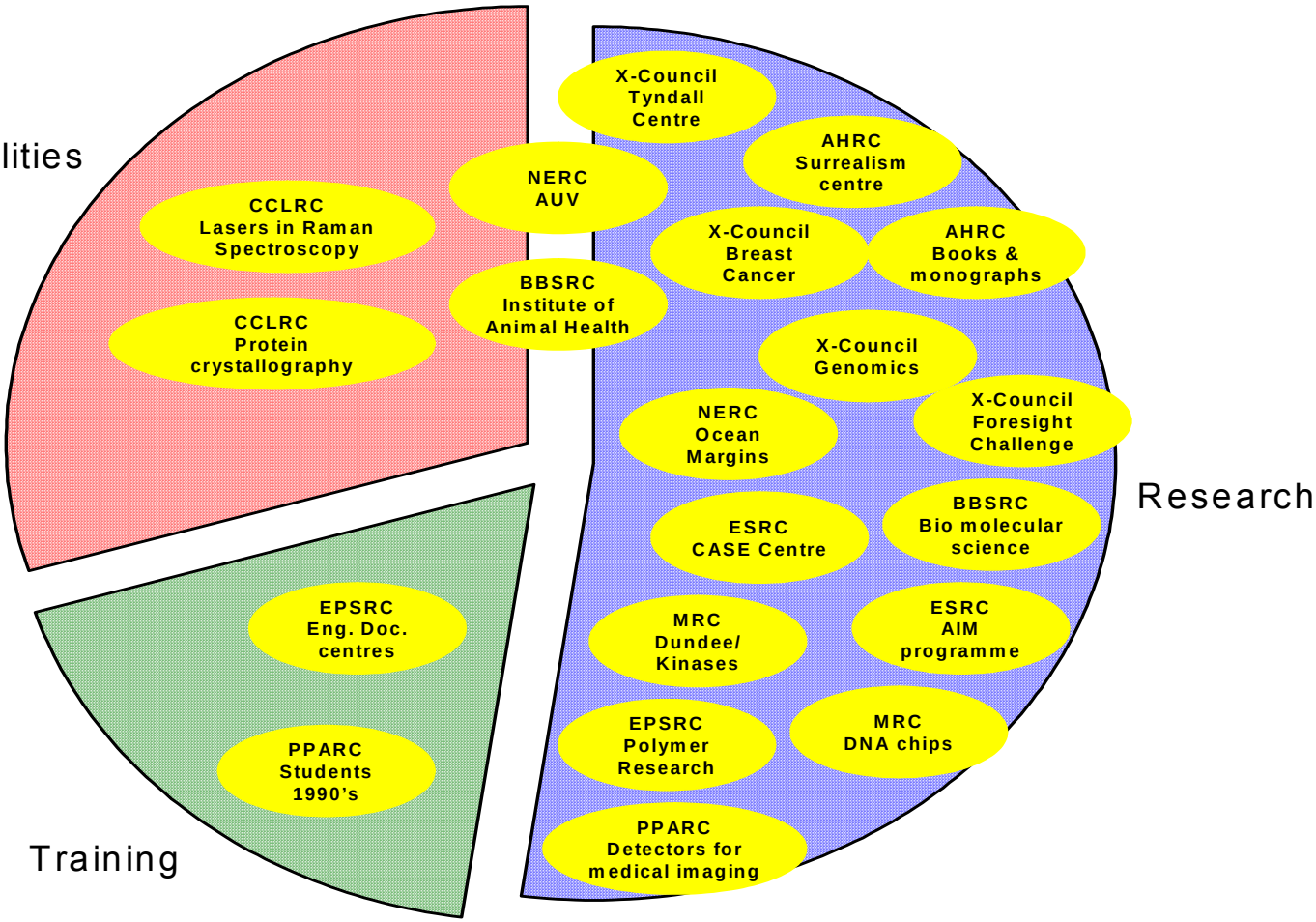
Inputs
2
Gross outputs
3
Net outputs
4
Economic impact
What are we doing
What they are:
£ and activities
Where they go:
Infrastructure
Programmes
PhD's etc
Direct Outputs…
• People assisted
• Facilities
• Patents
• Knowledge
• Equipment
+ 5 innovation 'outcomes'
• Factored appropriately
• Additionality, displacement, leakage and multipliers etc
• GDP
• Employment
• Well-being etc
How well we are doing it
Generic Data – Review of Reviews
Case Studies and Expert Opinion
Summation - total impact scaled
Lessons for future methodology
- e.g. metrics, data sources, scaling factors

Case studies mapped onto an aggregation of RCs' grant funding

18 case studies, mainly in research but also facilities and training



Note: Other non monetary accounting and non grant expenditure is excluded

INTRINSIC OF IMPACT ASSESSMENT (demonstrating causation in a complex system!)

Systems and Multipliers

- linear models of innovation are being superseded by dialectical, systemic understandings of innovation
- The wider societal impacts from research are influenced by external, interacting factors (‘multipliers’) beyond the control of the research base

Timing and Attribution

- Time lags (sometimes decades) between research outputs and eventual outcomes

Project Fallacy

- Connecting a major research impact with specific research project.

Problems demonstrating Cultural and Policy Impacts

- Research is not the only influence on policy makers!
- It is often very difficult to value such outputs.

Recommendations

- Establish Balanced Scorecards distinct from evaluation activities (evaluation to inform indicators for the BSCs) as decision making tools.
- BSCs and evaluations to utilise common set of basic indicators and data.
- Indicators to reflect differences between disciplines and funding modes between Councils i.e. different.

Suggested Indicators

- Selecting the Area for Investment
  - Extent to which users are involved in identifying prog areas.
  - Extent to which UK users have capacity of exploit results
- Investments
  - Reflect current expenditure by RCs e.g. collaborative grants.
- Outputs from Investments
  - Results of projects, trained people, potential contributions i.e. not actual impact.
- Transfer and Adoption of Outputs
  - Direct measures of economic impact (e.g. licensing) and indicators (e.g. spin outs).

- See http://www.rcuk.ac.uk/innovation/impact/default.htm for actual suggested indicators

Outputs and Outcomes Collection Project (Outcome/Impact)

- Collaboration
- Follow-on Funding
- Measures of Esteem
  - Prizes
  - Awards
  - Professional Activities
  - Honours
- Exploitation
  - Patent
  - Spin-out company (turnover, employees, etc.)
  - Licence agreement.
  - Other data sharing
  - Changes (processes, practices, policies, etc.)
  - New products

Developing the Agenda

- Economic Impact Reporting Framework
  - Based on DIUS Model of Economic Impact
  - Metrics and Indicators

- Beyond case studies ... economics ... narratives ...

Overall economic impacts

Increased productivity

Improved welfare

Innovation outcomes and outputs

Technological innovation

Wider innovation

Knowledge generation

Human capital

Stock of publicly available knowledge

Investment in the research base and innovation

Expenditure on R&D

Expenditure on Innovation

Demand for innovation

Private and public sector attitudes and capacities to develop innovation outputs.

Knowledge exchange efficiency

Ease of co-operation/collaboration; transit of information flows.

Framework conditions

Attractiveness of UK to overseas investment; the IP framework; public engagement; sustainability; standards

Economic Impact Reporting Framework

- Collaboration intensity: expenditure on collaborative research with users and % of total net spend on research grants
- Collaborator investment: resource contribution of users reported on completed grants per annum
- Employer investment: resource contribution of employers to collaborative postgraduate training
- Enterprise support: expenditure on programmes to promote commercialisation and enterprise
- Collaboration intensity: expenditure on collaborative and vocational postgraduate training

- Strategy formulation: user representation on EPSRC policy and advisory bodies
- Collaborator satisfaction: % of collaborators satisfied with their research grant partnership
- First destination of EPSRC-funded PhDs
- First destination of EPSRC-funded research assistants (PGRAs and PDRAs) (2004-05)
- Strategic partners: number of organisations that engage with EPSRC through a Strategic Partnership agreement
- Strategic partnership activities: number of activities in which EPSRC engages formally in a jointly funded venture with its Strategic Partners
- Research reach: number of organisations collaborating on current research grants
- Research exploitation: number of commercialisation activities (eg, follow on industry funding licensing, patents, spinouts) reported on EPSRC research grants

- Joint publications with Industry as % of all publications arising from EPSRC Research Grants
- Percentage of assessed grants with at least one paper with a co-author from industry
- Training reach: Number of user organisations engaged in collaborative training
- PhD Career Trajectories: % of ex-PhD students that take up employment in industry, commerce or public sector
- Research Career Trajectories: % of ex-research staff that take-up employment in industry, commerce or public sector
- % of EPSRC-funded PDRAs and PGRAs in business and public services
- % of EPSRC-funded PhDs first destination in business and public services

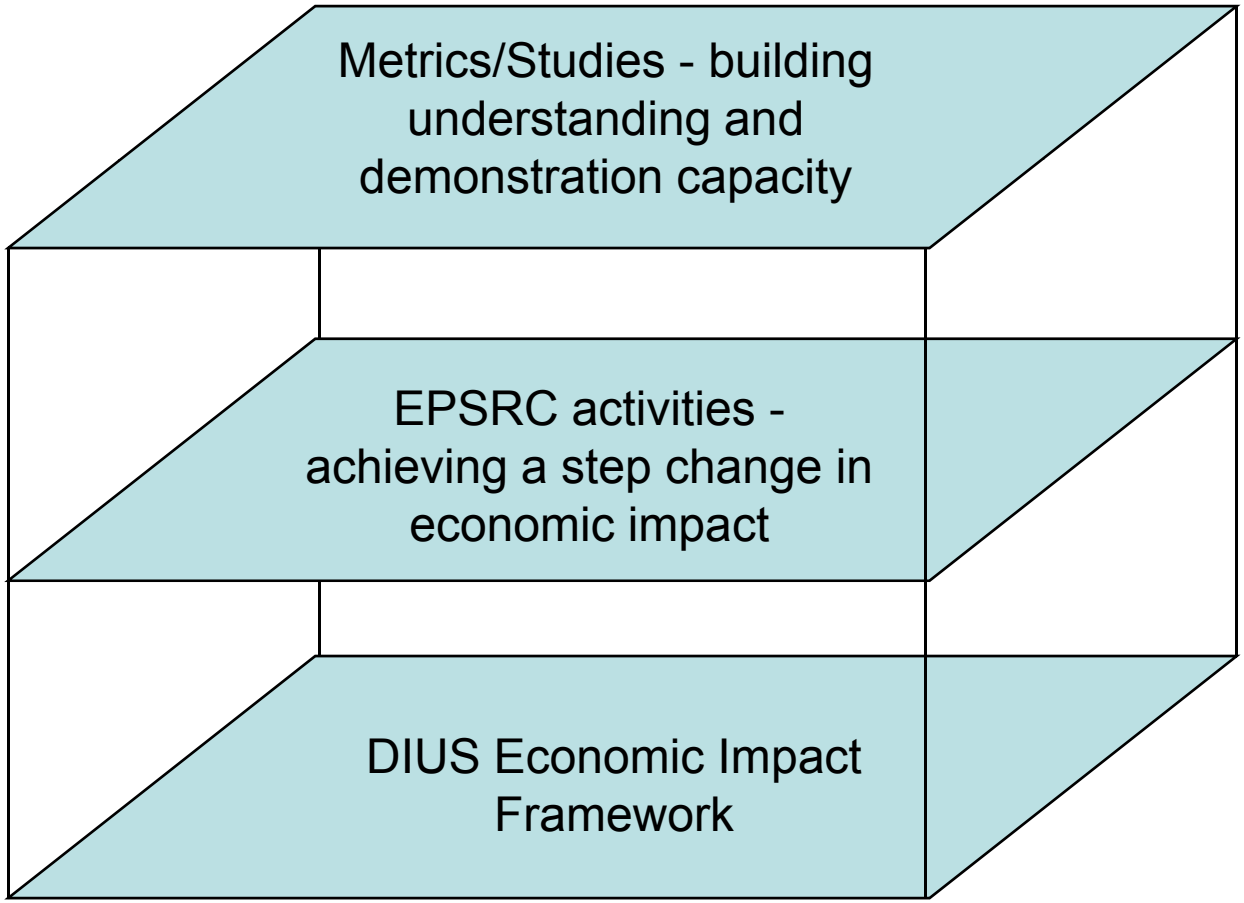
Developing the EPSRC's Agenda

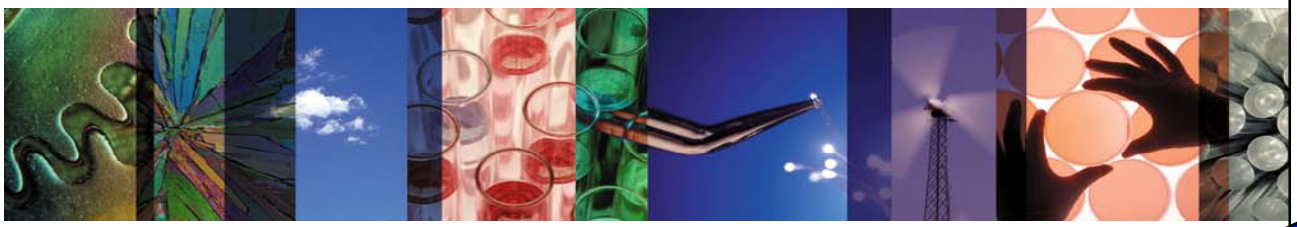
- Narrative
- Economic Impact Reporting Framework
- Economic Studies

Developing the Economic Impact Baseline

- Model of EPSRC's role in delivering Economic Impact (Sept 2008)
- Develop outline narrative based on this model and agreed plan to populate with qualitative and quantitative evidence (Oct 2008)
- Draft EI baseline narrative - seek feedback from DIUS (Feb 09)
- EI Baseline finalised – Mar 09

EPSRC's Economic Impact Model





Human capital

Evaluation of user-led doctoral training, KTAs

Human capital ≡ skilled scientists and engineers

Value of EPS Ph.D.

Renewing the research base

Improving innovation capacity/capability of business to absorb through understanding of the research base

Not for profit, public sector, social welfare, etc.

Case Study/(ies)

Case Study/(ies)

Evaluation of fellowships, S&I awards, 1st grants, challenging engineering

New or improved products/processes/services

Policy/welfare impacts

Economic Impact Narrative

- What is the role of EPSRC in delivering EI
  - Providing trained people – human capital
  - Research – knowledge generation
  - KT activities – knowledge exchange efficiency
- What actions are we taking to increase the EI in each of the above areas, why and what has lead to this balance?
- How will we demonstrate the impact of our actions?
- What past activities have resulted in the greatest impact?
- What gaps have we identified and how will we address them?

Economic Impact Studies

- In collaboration with the IoP, RAS and STFC - an assessment of the economic impact arising from fundamental physics.
- Jointly with the RSC - an assessment of the economic impact arising from fundamental chemistry (due to report April 2009).
- From the physics and chemistry studies we hope to derive a methodology, collection of techniques which could be applied on a periodic basis to all areas of our portfolio (likely to be meaningful only on a 5 – 10 year timescale).
- An assessment of the value of the EPS Ph.D.

Other Examples

- RCUK: Long-term career path study (i.e. benefits in addition to increased salary).
- MRC: “Medical research - assessing the contribution to society“. Launch - 25th and 26th November, London.
- NERC: Economic Benefits of Environmental Science – November 2006.
- BBSRC: Making a difference (economic and societal impacts of a BBSRC Institute) Sept 2006.
- ESRC: Evaluating the impact of ESRC funding, Oct 2007.
- AHRC: Assessment of impact of 5 representative funded awards, Sept 2006.

Personal reflections …

Conclusion

- Metrics and Indicators are only part of the story.
- Need to better understand the ecosystem and organisation's role therein.
- Periodic (non-frequent) in-depth studies in focused areas.
- Fundamental constraints are real!

Thank you for your attention

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Discussion