From research results to policy outcomes: delivering a return on public investment in research

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**Thoughts on public sector research management and 'bridging the gap'
Presentation to the 4th 'Bridging the Gap' conference on 15 May 2008 in Slovenia**

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Some personal background:
Starting with farmer owned research programmes followed by….

The North of England´Arable Centre, now part of The Arable Group, United Kingdom

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Some personal background:
conducting public funded research supporting policy development followed by

Federal Agricultural Research Centre, Braunschweig, Germany

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Leading public research investment supporting policy development and delivery

Department of Food, Environment and Rural Affairs, and Houses of Parliament, UK

Modernising Government
March 1999

Policy making:

The process by which governments translate their political vision into programmes and actions to deliver "outcomes" - desired changes in the real world
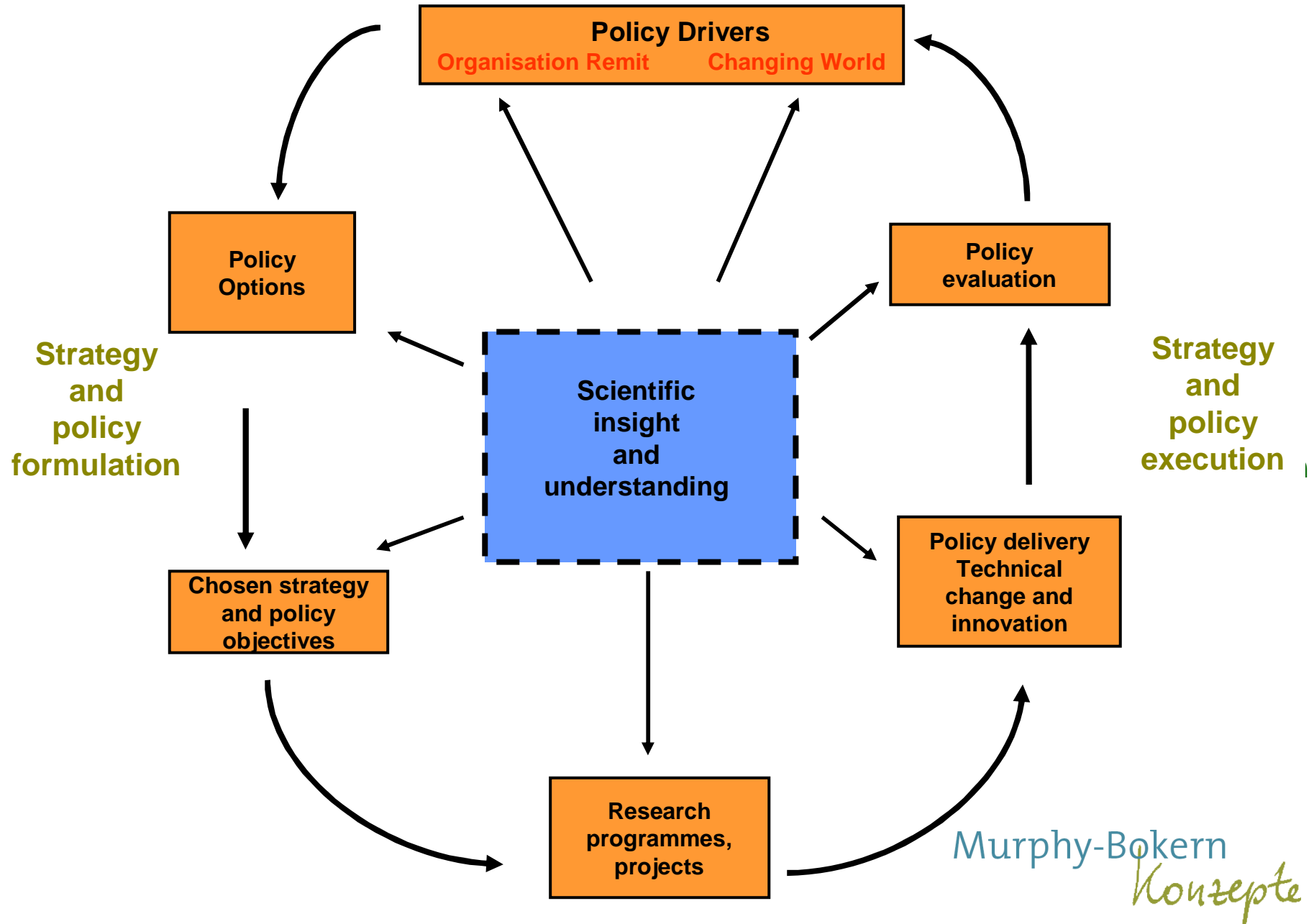
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Science (a policy maker's definition):

  The study of how the world works

**From research results to policy outcomes:
Evidence based policy development and delivery**

Policy Drivers
Organisation Remit   Changing World

Policy Options

Policy evaluation

Strategy and policy formulation

Scientific insight and understanding

Strategy and policy execution

Chosen strategy and policy objectives

Policy delivery Technical change and innovation
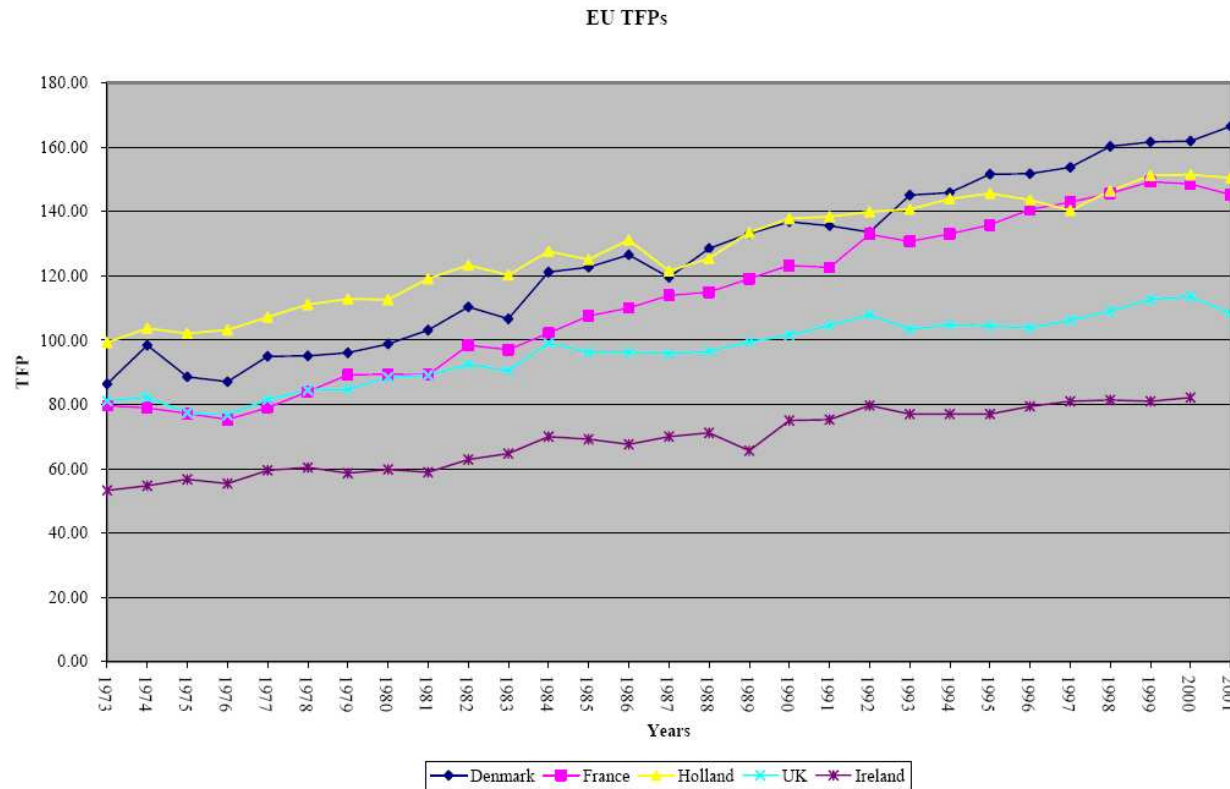
Research programmes, projects

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From research results to policy outcomes:
delivering a return on public investment in research – a UK experience

Between 1995 and 2005 Defra invested

- ca 200 million Euros in agri-environment research

- ca 300 million Euros in sector facing agricultural research

Weak bridge to policy outcomes, particularly delivery
through technical change and innovation

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Research investment decisions matter in the long-term:
Total Factor Productivity of agriculture in the UK, NL, Fr and Dk.

EU TFPs

Explaining the decline in UK agricultural productivity growth.
(Ref: Competitiveness of UK Farming: Measuring and Explaining Productivity Change. AES/Defra Conference, Sustainable Farming and Food. 30 January 2003. Bailey et al., presented by Colin Thirtle.

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From research results to policy outcomes: delivering a return on public investment in research – words matter

- Policy outcomes

- Delivering a return

- Investment

The words normally used: 'funding', 'funder', grants etc. induce a malaise – a lack of focus on returns damaging delivery, toleration of unstable investment and thus the sustainability of the research base

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Traditionally, research serving public policy has often been science led under the 'Haldane Principles' laid down by Viscount Haldane in 1918

Science driven research activities	→	Policy options	→	Policy delivery, technical change

Advantages

Fosters science and policy opportunities – indentifies new hazards and opportunities

Disadvantages

Poor focus on user needs
Lack of relevance of research outputs
Not responsive to policy change

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Traditionally, research serving public policy has often been science driven but….


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┌─────────────────────┐      ┌─────────────────────┐      ┌─────────────────────┐
│   Science driven    │ ───► │   Policy options    │ ───► │ Policy delivery,    │
│  research activities│      │                     │      │  technical change   │
└─────────────────────┘      └─────────────────────┘      └─────────────────────┘
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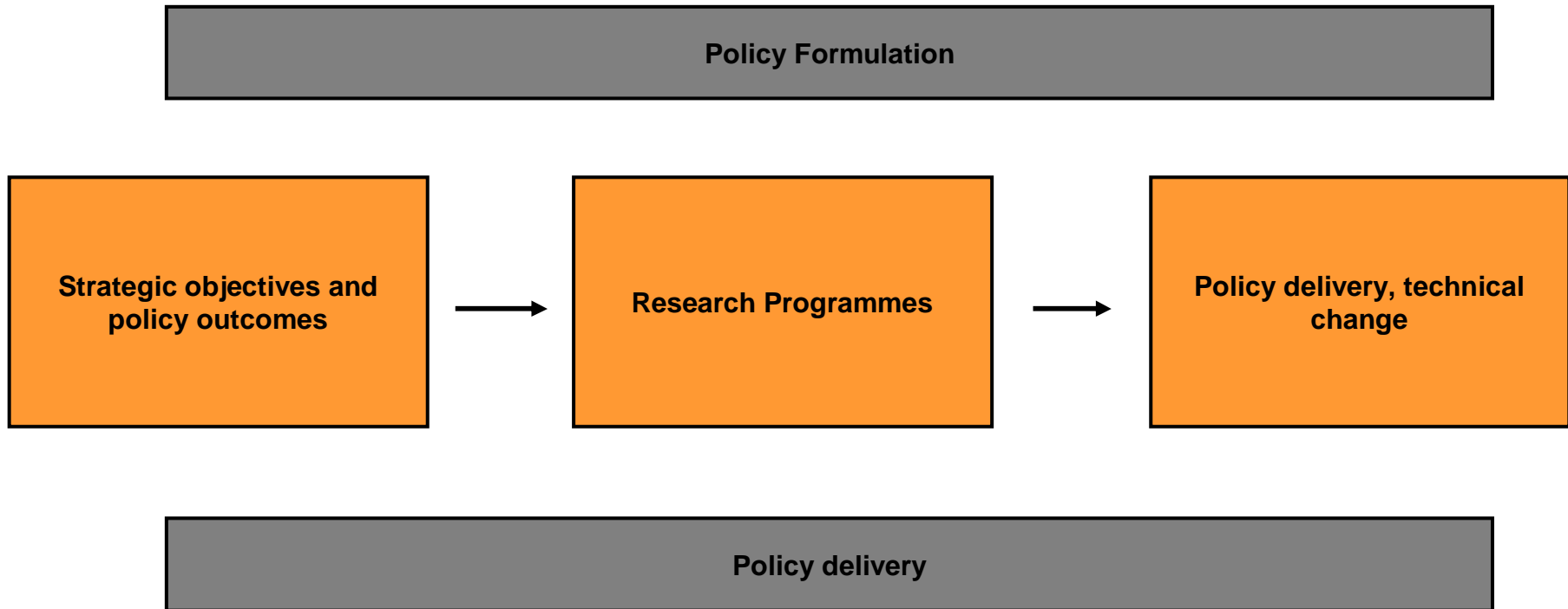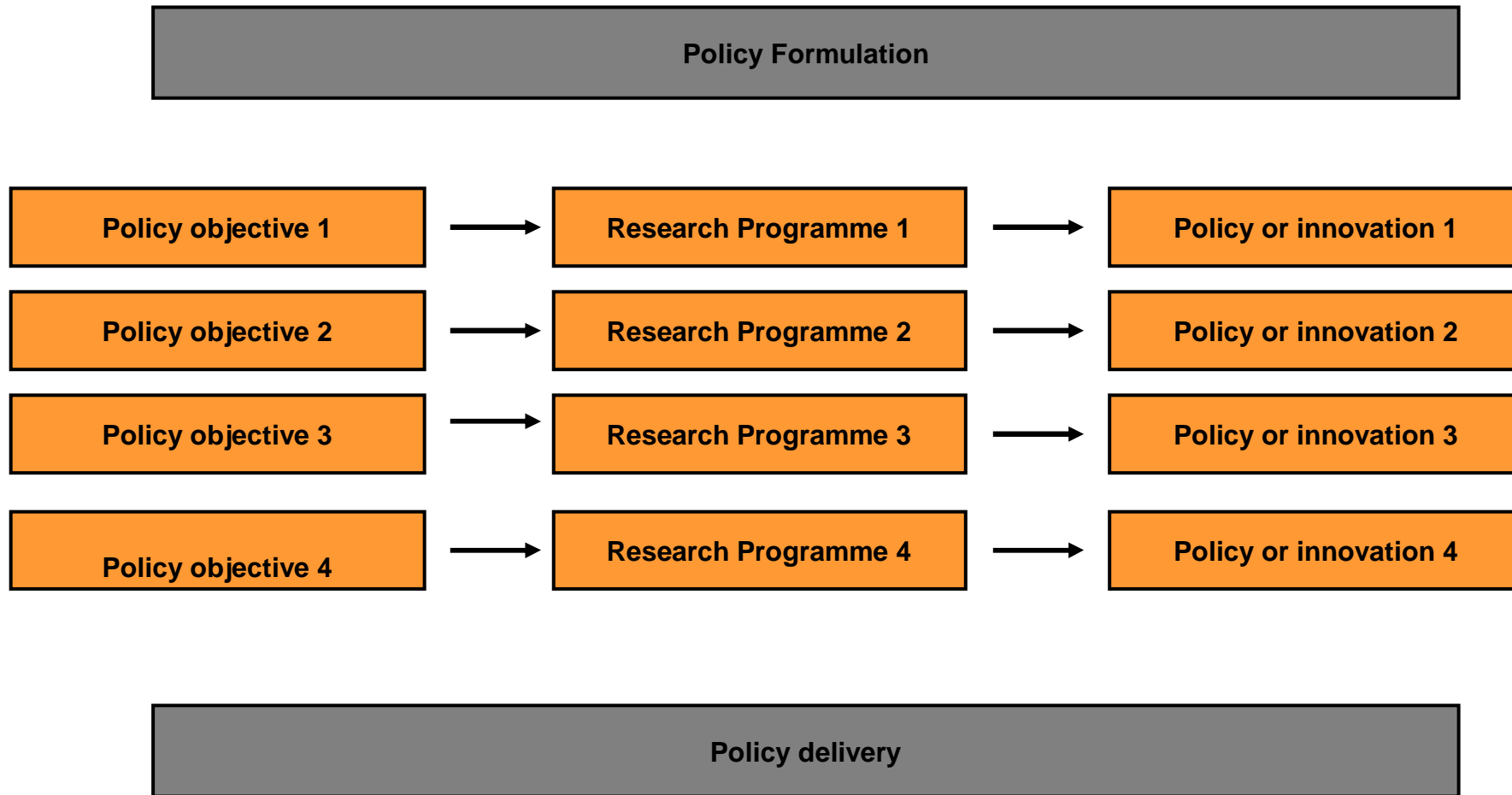*"the country's needs are not so trivial as to be left to the mercies of a form of scientific roulette"*

Lord Rothschild, 1972

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Policy making bodies have responded by investing in policy led research and…

Policy Formulation

Strategic objectives and policy outcomes → Research Programmes → Policy delivery, technical change

Policy delivery

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Gone as far as tramlining research investment onto current policy objectives

Policy Formulation

Policy objective 1	→	Research Programme 1	→	Policy or innovation 1
Policy objective 2	→	Research Programme 2	→	Policy or innovation 2
Policy objective 3	→	Research Programme 3	→	Policy or innovation 3
Policy objective 4	→	Research Programme 4	→	Policy or innovation 4

Policy delivery

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Research tramlined onto policy (user) needs is plausible, but……

Policy Formulation

Policy objectives	→	Research Programmes	→	Policy or innovations
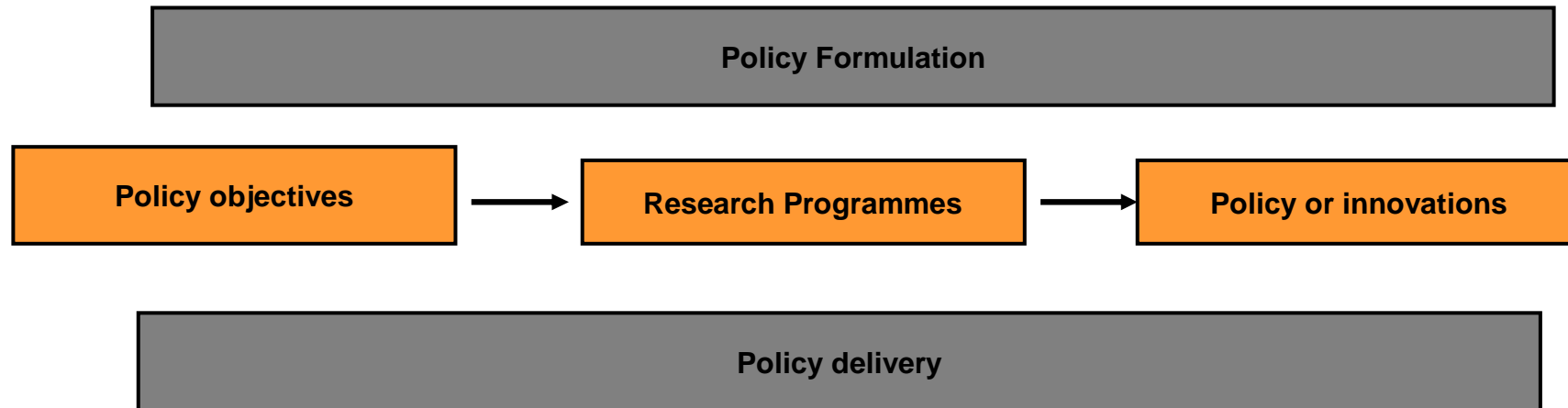
Policy delivery

Scientists deliver knowledge and understanding, not policy or innovation outcomes.
Fragmentation of the science base.
Duplication of research effort – differing policy areas have overlapping research needs.
Fragmentation of effort leading to inaccessible and unusable outputs.
Instable investment – the flap of a butterfly's wing in policy can cause a storm in the research community.
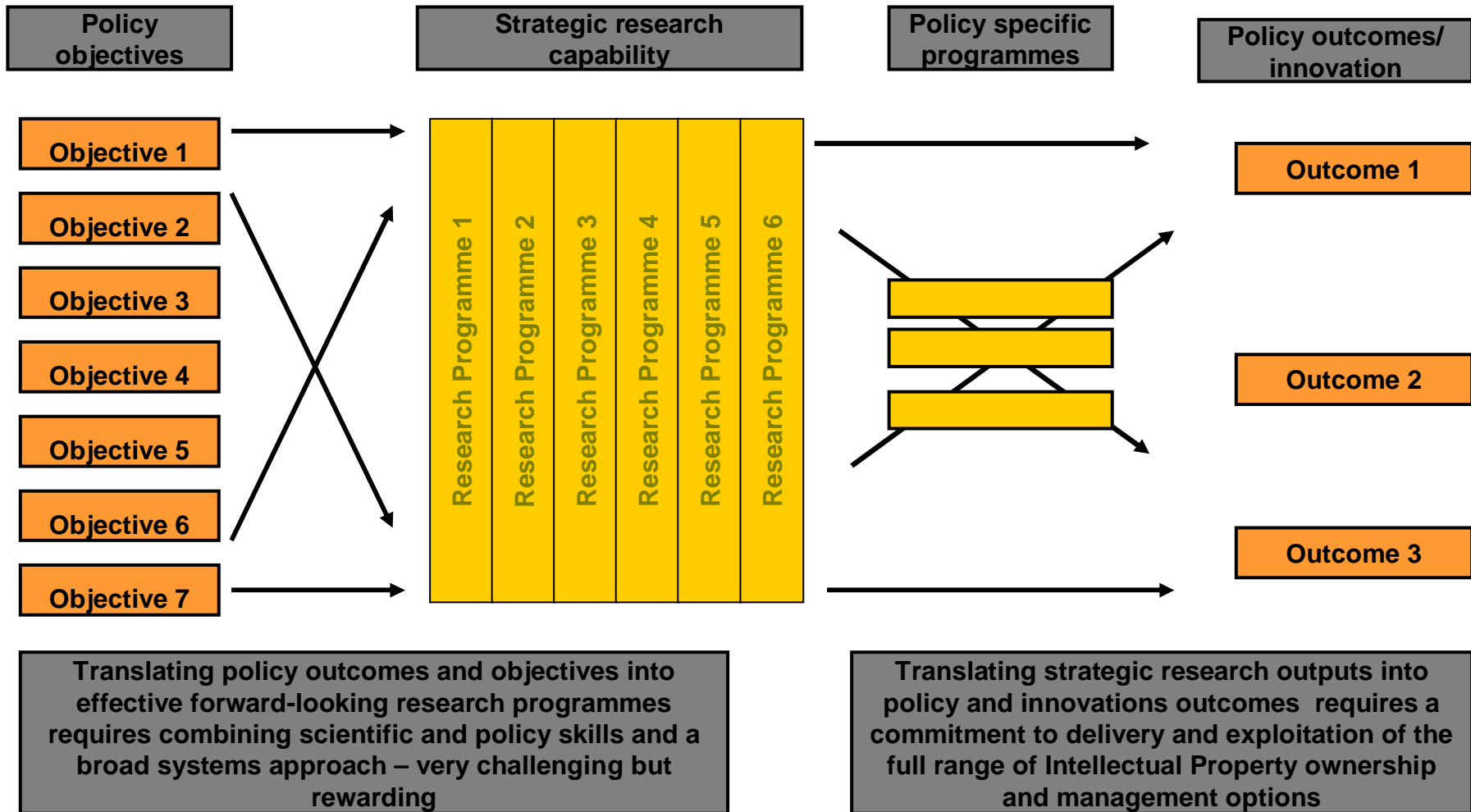Late delivery – research follows policy, policy has moved on.

There is a huge difference between policy led and policy driven research – policy organisations can drive strategic research but may struggle to lead strategic research

So….

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Policy outcomes need to be articulated into robust coherent strategic research capability and

Strategic research outputs need to be articulated into policy outcomes and innovation

Policy objectives

- Objective 1
- Objective 2
- Objective 3
- Objective 4
- Objective 5
- Objective 6
- Objective 7

Strategic research capability

Research Programme 1
Research Programme 2
Research Programme 3
Research Programme 4
Research Programme 5
Research Programme 6

Policy specific programmes

Policy outcomes/ innovation

- Outcome 1
- Outcome 2
- Outcome 3

Translating policy outcomes and objectives into effective forward-looking research programmes requires combining scientific and policy skills and a broad systems approach – very challenging but rewarding

Translating strategic research outputs into policy and innovations outcomes requires a commitment to delivery and exploitation of the full range of Intellectual Property ownership and management options

'Intelligent decoupling'

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**Delivering a return on public investment in research:
Leading technical change and innovation**

Traditional emphasis on telling users of research outputs
what to do –e.g. in agricultural extension:

'getting the message across'

'knowledge transfer'

'changing behavior'

In other words – doing things to passive research users -
this is patronising and disempowering

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Delivering a return on public investment in research
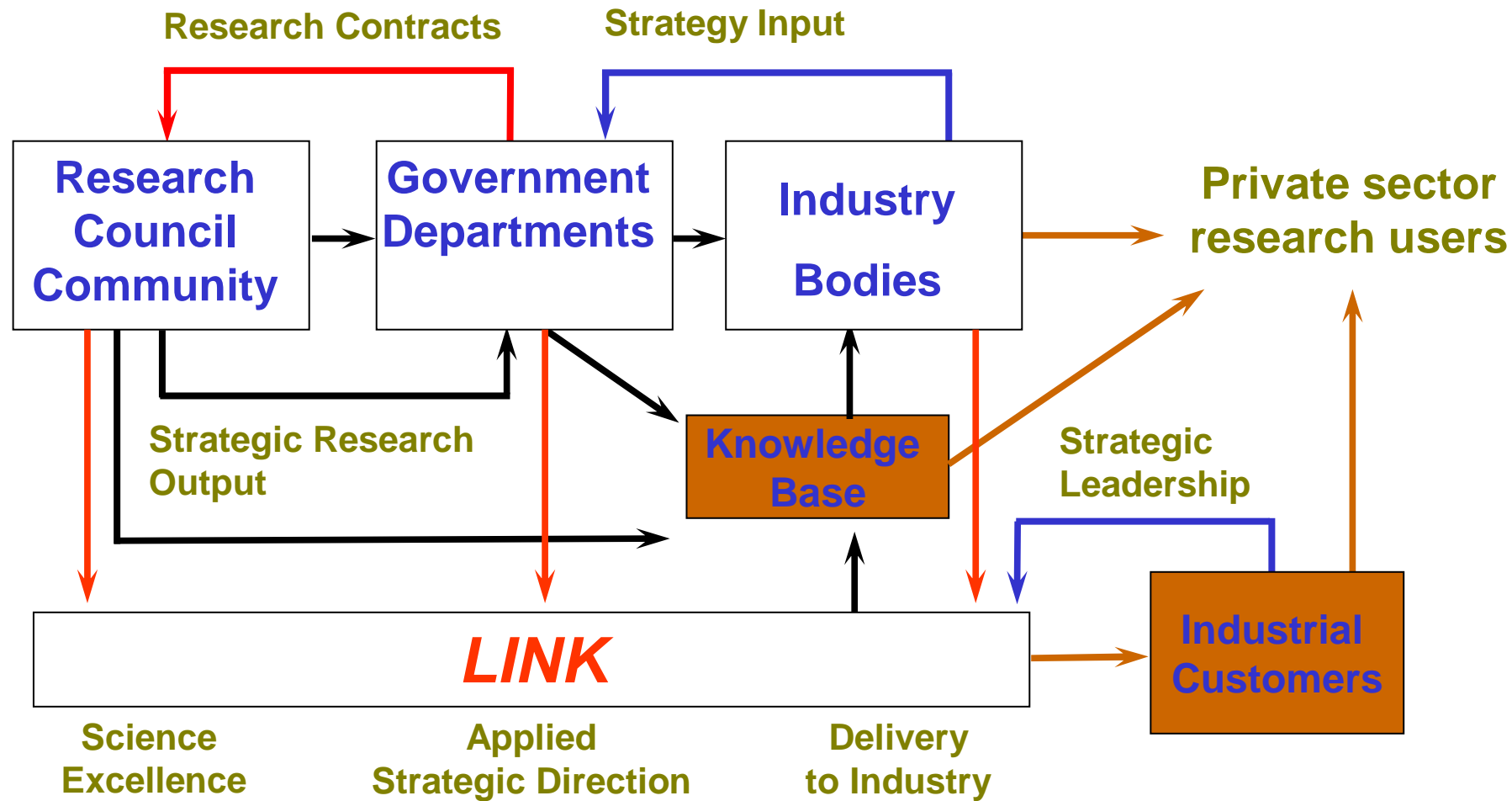
Understanding empowers

Provide access to knowledge – <u>knowledge access</u>
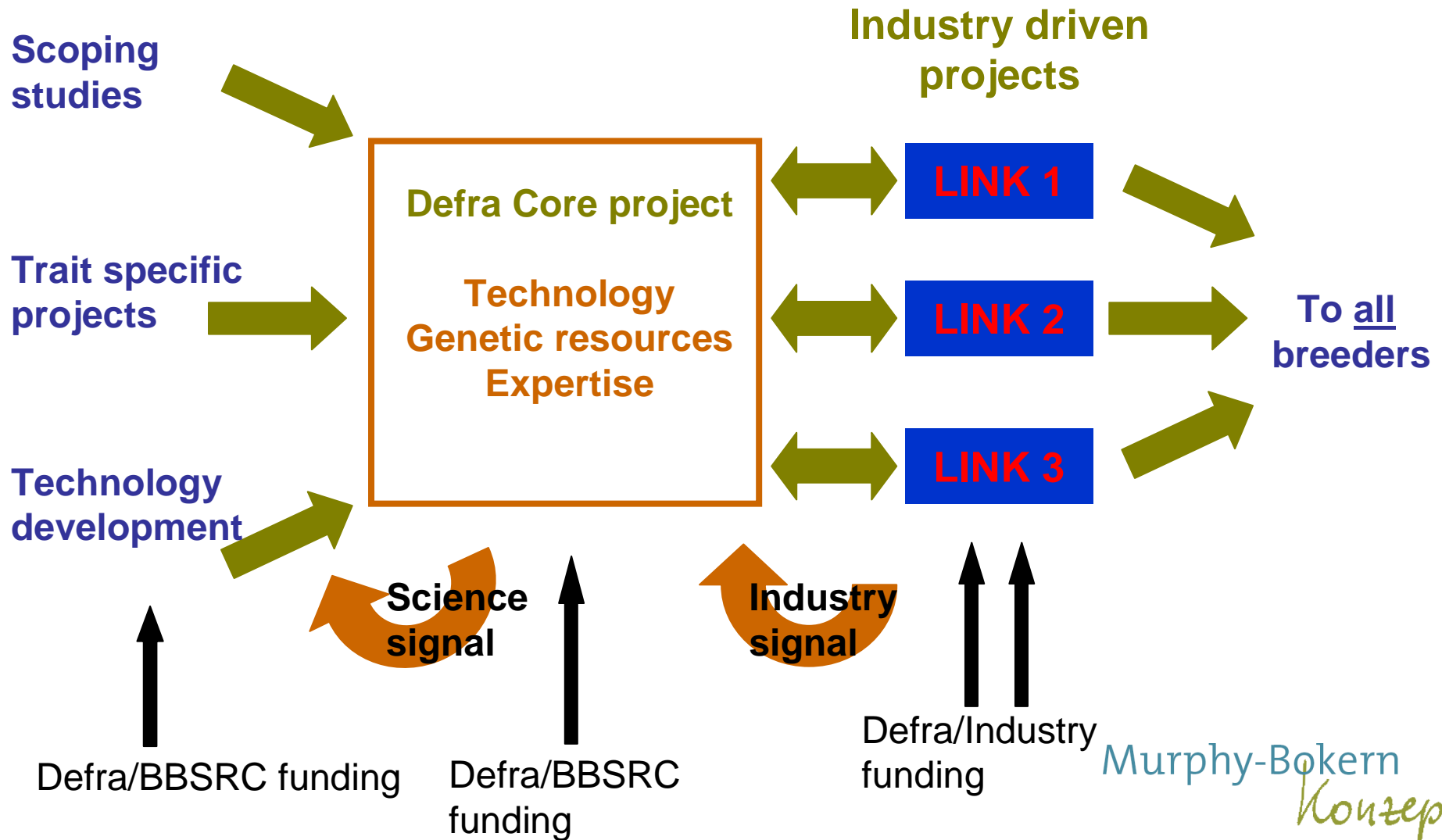
Foster <u>knowledge acquisition</u>

Be realistic about the commercial value of IP

Bundle research outputs into usable technologies – e.g. seeds and decision support systems

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Embedding research users into research programmes – e.g. LINK in the UK

Research Contracts

Strategy Input

Research Council Community	Government Departments	Industry Bodies

Private sector research users

Strategic Research Output

Knowledge Base

Strategic Leadership

LINK

Industrial Customers

Science Excellence

Applied Strategic Direction

Delivery to Industry

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Embedding delivery partners into research programmes –
The Defra Crop Genetic Improvement Networks
'a functioning system of supply and demand'

Scoping studies

Trait specific projects

Technology development

Defra Core project

Technology
Genetic resources
Expertise

Industry driven projects

LINK 1

LINK 2

LINK 3

To all breeders

Science signal

Industry signal

Defra/BBSRC funding

Defra/BBSRC funding
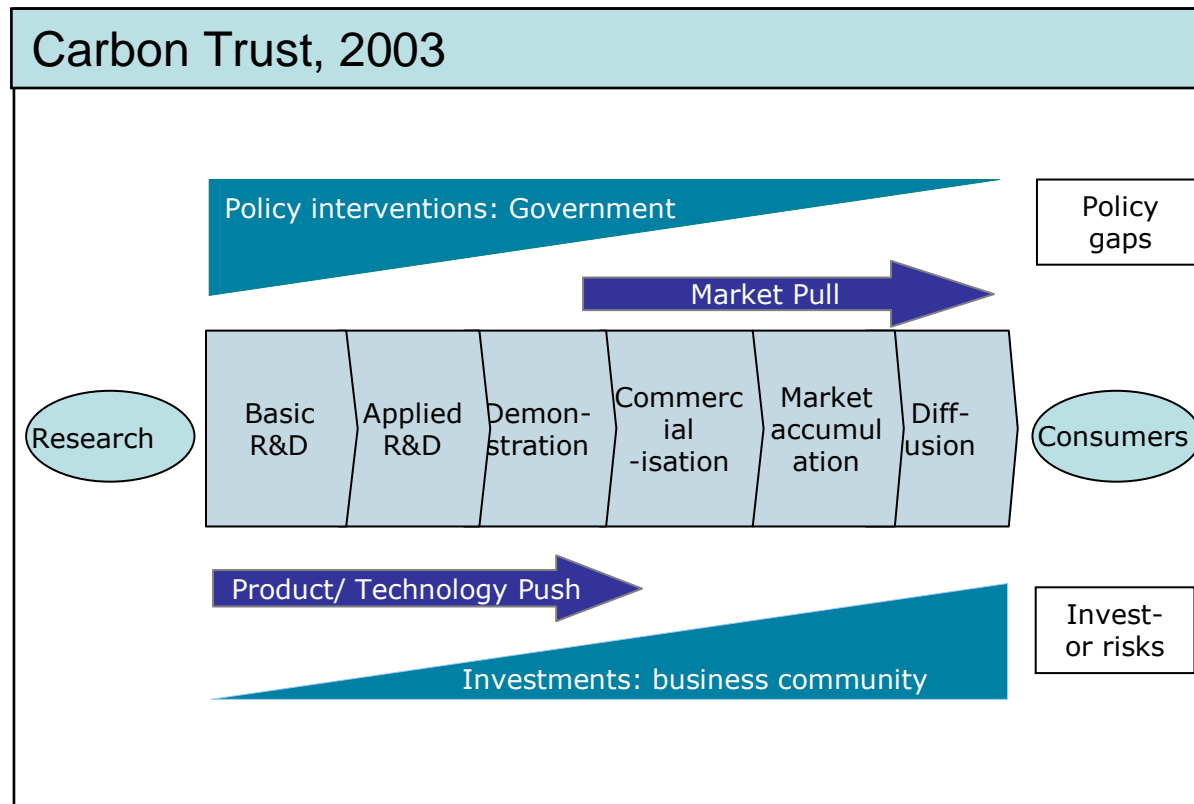
Defra/Industry funding

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Delivering a return on public investment in research – seeing the investment through
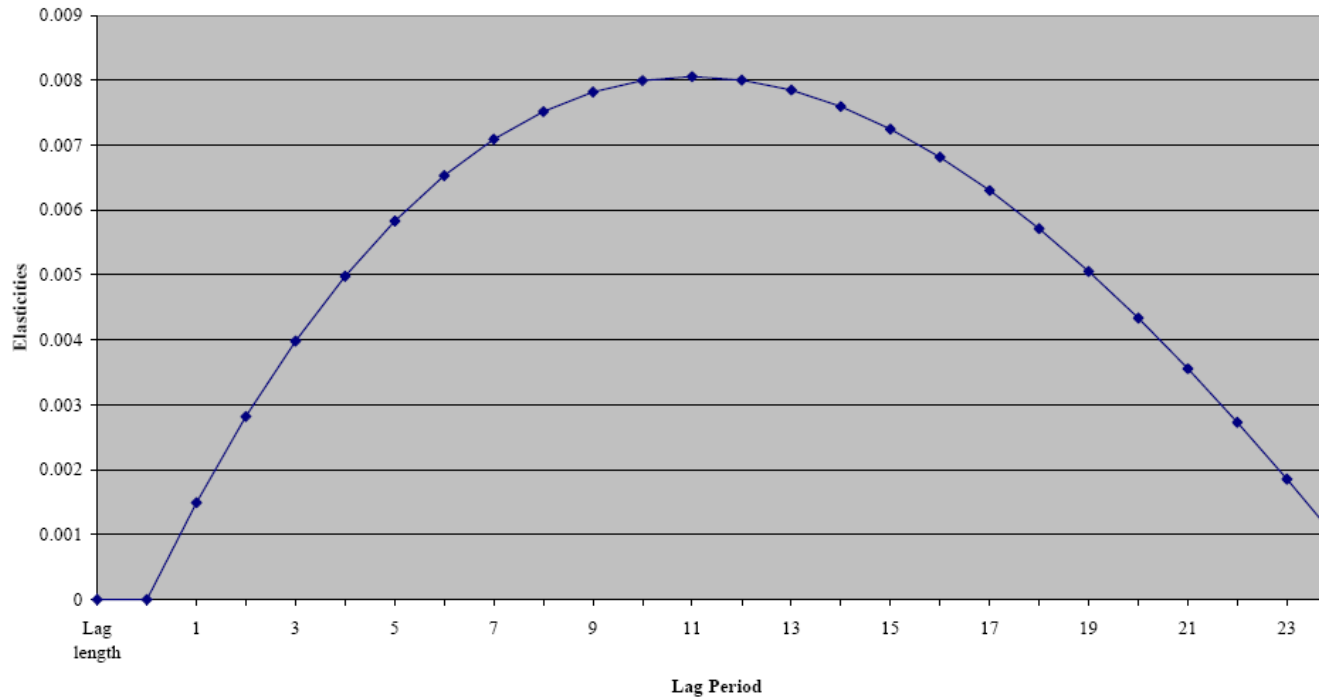
Lagged impact of R&D on productivity. (Ref: Competitiveness of UK Farming: Measuring and Explaining Productivity Change. AES/Defra Conference, Sustainable Farming and Food. 30 January 2003. Bailey et al., presented by Colin Thirtle.

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Conventional models for technology innovation consider a single journey from research to market/use

Carbon Trust, 2003

Research

Policy interventions: Government

Market Pull

Basic R&D | Applied R&D | Demon-stration | Commercial-isation | Market accumulation | Diff-usion

Consumers

Policy gaps

Product/ Technology Push

Investments: business community

Invest-or risks

Source: Inducing Innovation for a low-carbon future: drivers, barriers and policies, Foxon, 2003

Ref: Carbon Trust, 2007

The Carbon Trust's approach to technology innovation addresses 4 necessary journeys

Technology journey

| Proof of principle (Fundamental research) | Proof of concept (Applied research) | Proof of viability (Early demon-stration) | Proof of scalability (Full demon-stration) | Proof of value (Marketable product) | Proof of quality (Optimised product) |

+

Company journey

| 1 or 2 individuals (sweat equity) | Form venture (or new unit) (Friends & family) | Bring in first outsider (Angel or seed) | Recruit specialists (Venture Capital) | Grow operational staff (IPO) | 30-50 employees (Revenue) |

Market journey

| No interaction (Technology push) | Markets identified (Indifference) | Market Field trial (Recognition) | Early adopt-ers & niches (Benefit quantified) | Rational economic purchase (Market pull) | Technology & market evolution (Feedback) |

Regulation journey

| General Regulation neutral or negative | General Regulation neutral | Specific Regulation positive | General Regulation positive | General Regulation neutral or positive |

Delivering a return on public investment in research:
The Carbon Trust approach

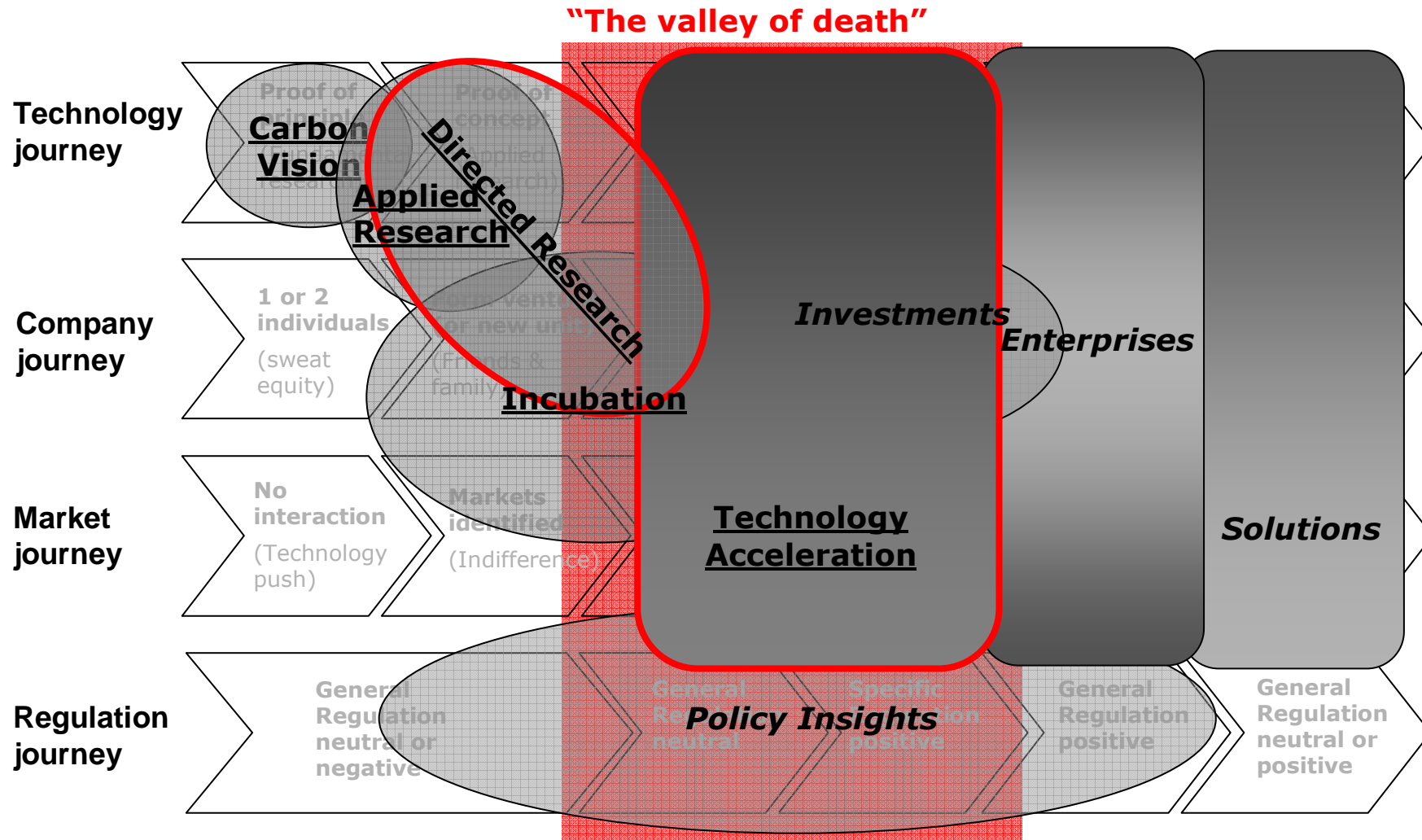**Working with the grain of capital markets**

Carbon Trust <u>Innovations</u>
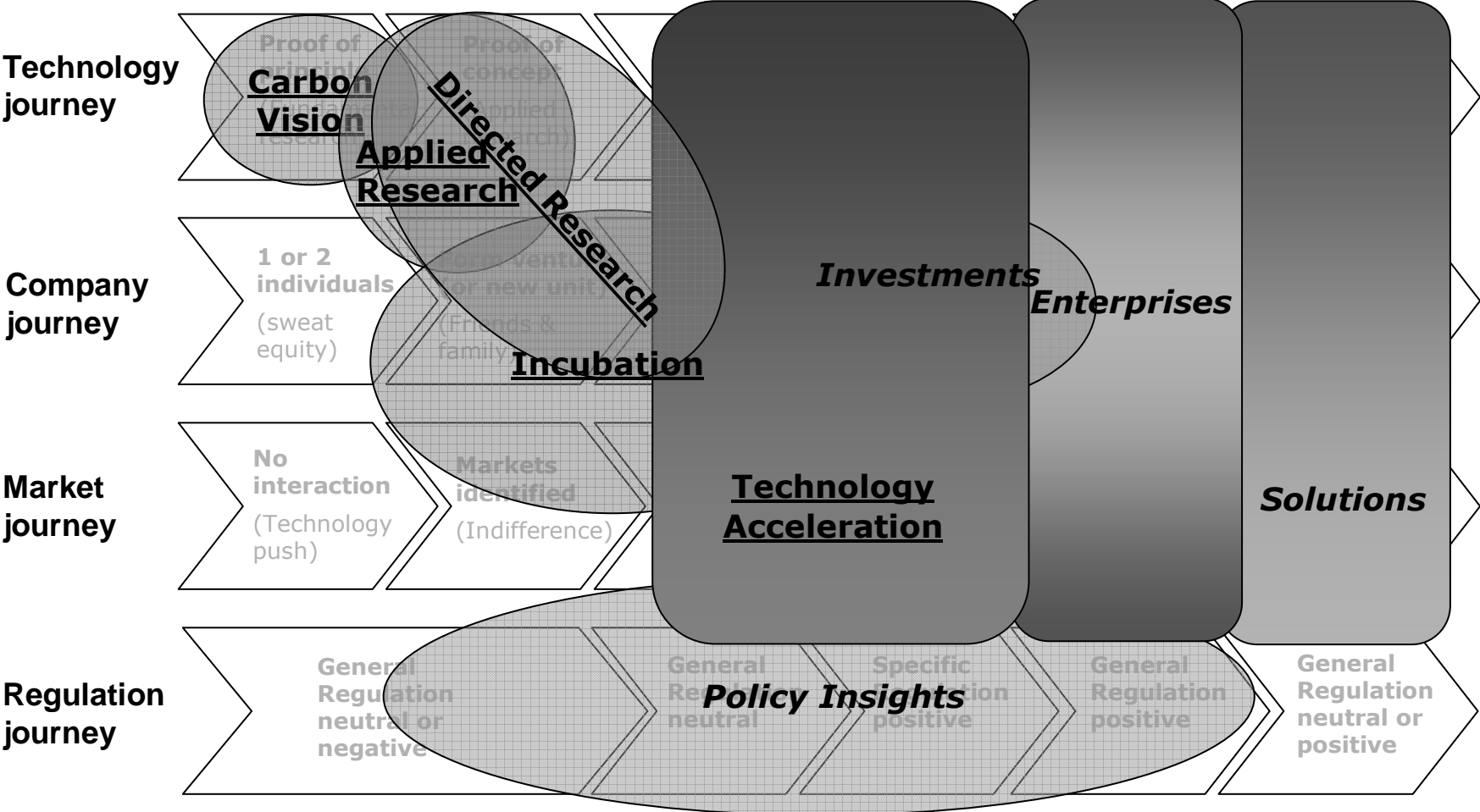
Directed Research is designed to work with existing Carbon Trust Technology Acceleration programme to bridge the "valley of death"

"The valley of death"

Technology journey

Carbon Vision

Applied Research

Directed Research

Proof of principle (Fundamental research)

Proof of concept (Applied research)

Company journey

1 or 2 individuals (sweat equity)

Spin-out (new venture or new unit) (Friends & family)

Incubation

Investments

Enterprises

Market journey

No interaction (Technology push)

Markets identified (Indifference)

Technology Acceleration

Solutions

Regulation journey

General Regulation neutral or negative

General Regulation neutral

Specific Regulation positive

Policy Insights

General Regulation positive

General Regulation neutral or positive

From research results to policy outcomes

- **<u>Invest</u> coherently in clear research targets and capability**

- **Balance science led and policy driven research**

- **Assess market failure realistically – additive public investment**

- **Invest in appropriate near-market research**

- **Translate policy outcomes into research targets**

- **Embed delivery into the research**

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From research results to policy outcomes

- Foster system understanding to enhance transferability of research

- Provide access to research outputs – free research data and information are the oxygen of the translation process – free web publishing

- Foster active knowledge acquisition

- Value IP realistically – aggressive IP policies damage delivery

- Commercialisation and widespread exploitation of IP are not the same

- See the research investment through to the delivery of usable knowledge and technology

- Foster equality of esteem for fundamental, strategic and applied research, and research delivery.

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Thank you for your attention

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Research strategy - Programme management   - Policy development - Translations