

What is Responsible Innovation?

Translating Research Policy into Research Practice

Responsible Innovation:

Industrial Biotechnology and Engineering Biology online event

Prof. Phil Macnaghten

25 January 2021



Today's talk

- Models of responsibility in science
- What is responsible innovation
- A framework of responsible innovation
- Translating research policy into research practice

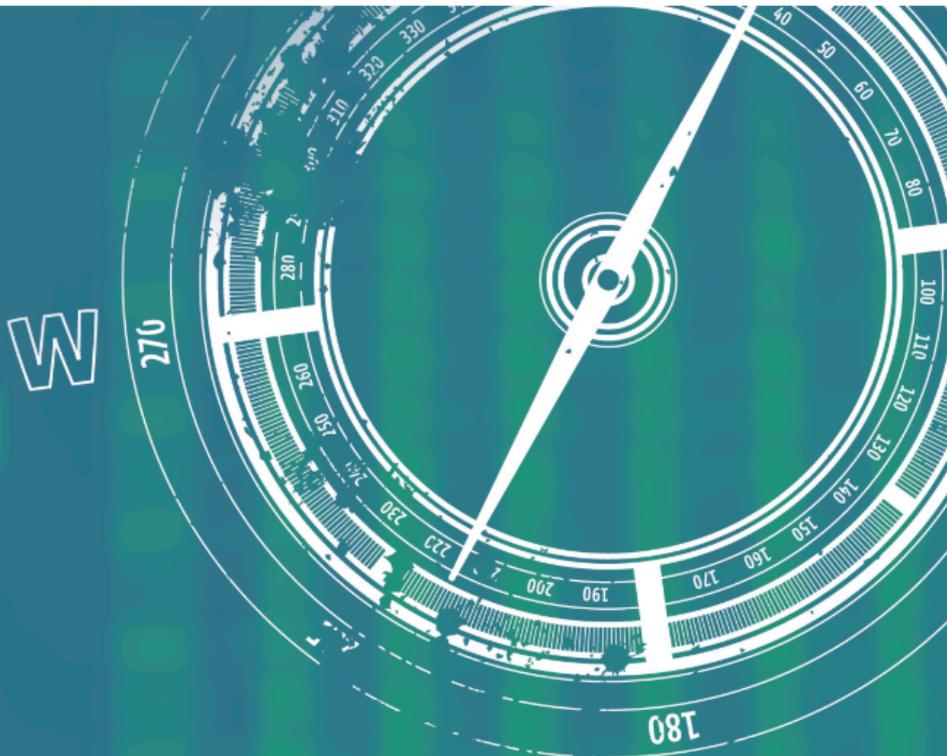
Responsibility 1.0: Research integrity

Robert Merton, 1942: To produce reliable knowledge accomplished by enforcing institutional norms (CUDOS)

- Communalism
 - all scientists should have common ownership
- Universalism
 - scientific validity is independent of status
- Disinterestedness
 - scientific institutions act for the benefit of a common scientific enterprise
- Organised Skepticism
 - scientific claims should be exposed to critical scrutiny

Associated with the linear model

- Innovation seen as inherently steerless and 'good'
- Basic scientists do not and should not consider applications
- But applications will emerge from basic science
- And the nations that support the basic science will gain economic rewards
- Macro-economic justification of Research and Innovation



Netherlands Code of Conduct for Research Integrity

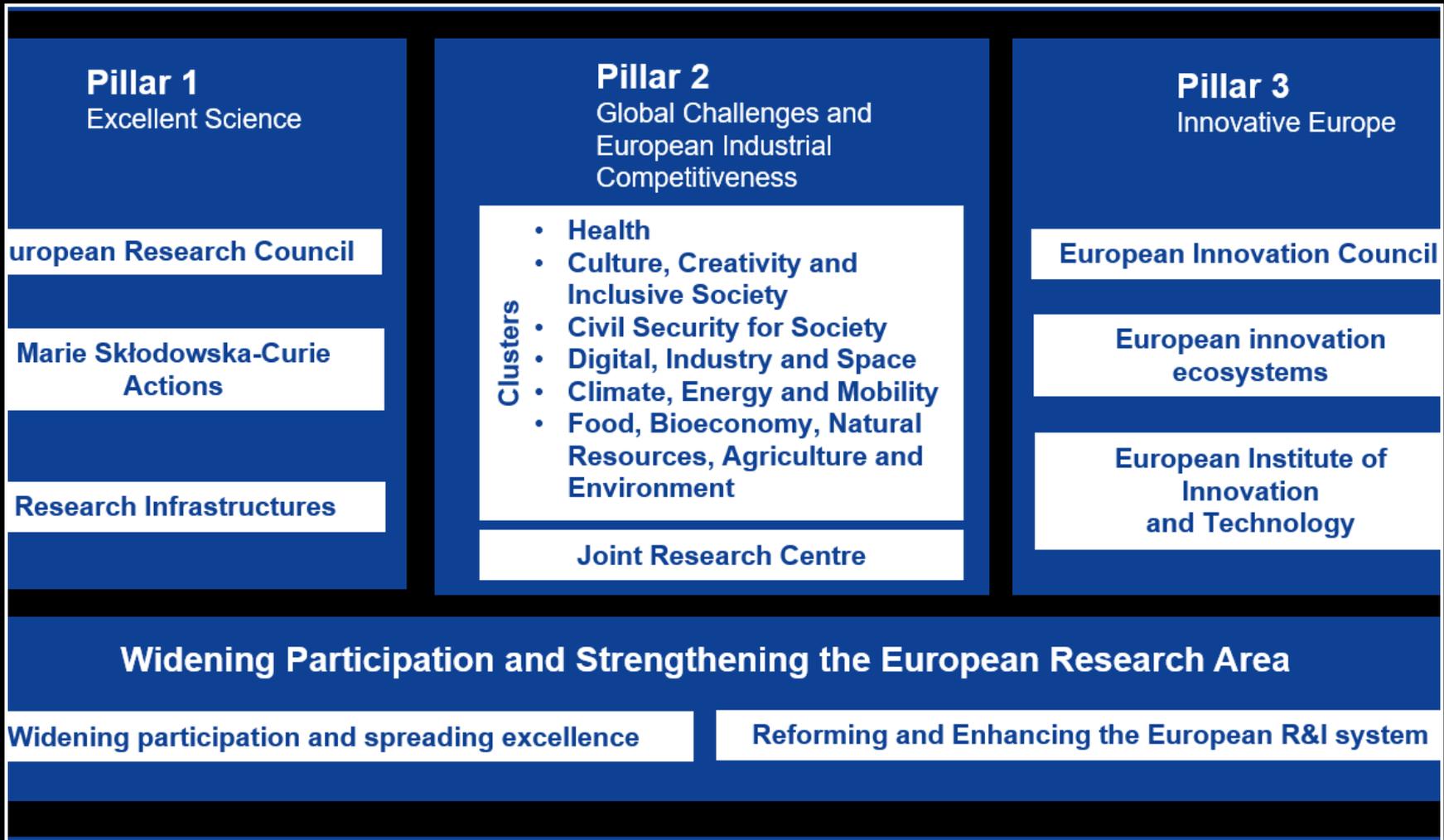
2018

- Honesty
- Scrupulousness
- Transparency
- Independence
- Responsibility
 - “Responsibility means, among other things, acknowledging the fact that a researcher does not operate in isolation and hence taking into consideration – within reasonable limits – the legitimate interests of human and animal test subjects, as well as those of commissioning parties, funding bodies and the environment. Responsibility also means conducting research that is scientifically and/or societally relevant.”



Responsibility 1.0: Supporting people

- Equality
- Diversity
- Inclusion



Responsibility 2.0 Science for Society

MISSION AREAS:

Soil health and food



Cancer



Adaptation to climate change, including societal transformation



Climate-neutral and smart cities



Healthy oceans, seas, coastal and inland waters



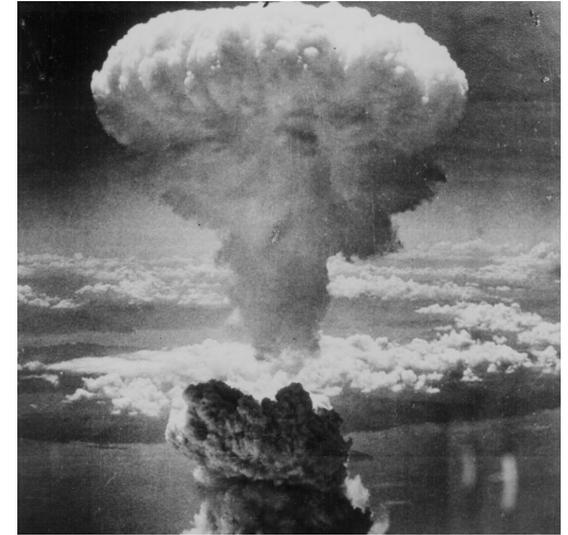
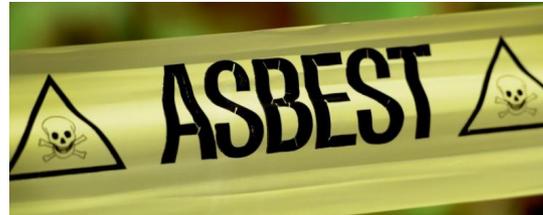
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‘New science and innovation – new dilemmas’



Good intentions do not always lead to good outcomes

Responsibility 3.0: Science with and for Society (responsible innovation)

“a way to open up research and innovation activities, allowing all societal actors to work together during the whole research and innovation process in order to better align both the process and its outcomes with the values, needs and expectations of European society”

(European Commission 2013)

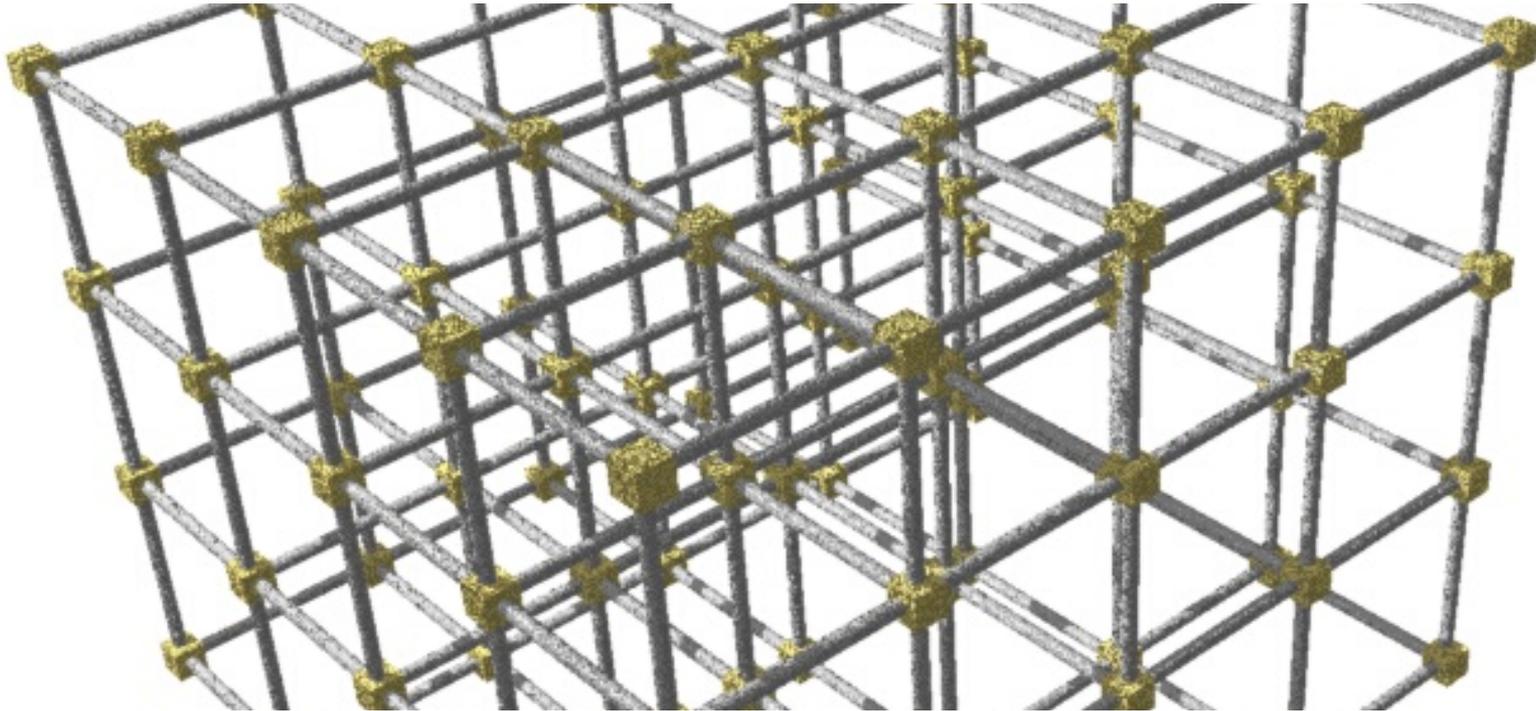
“taking care of the future through collective stewardship of science and innovation in the present”

(Stilgoe, Owen and Macnaghten 2013)

A (radical)
rationale for
responsible
innovation

“unless we find ways to shape science and innovation in tune with widely shared social values, future changes will occur without explicit societal shaping, commonly driven by the power of incumbent interests and the delegation of ‘the good’ to market forces”

How to build a framework for responsible science governance

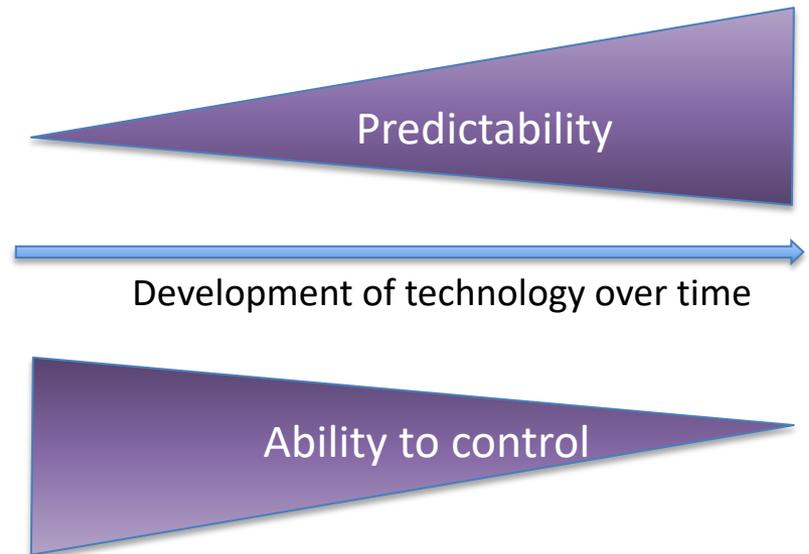


CHALLENGE

1

Collingridge's control dilemma

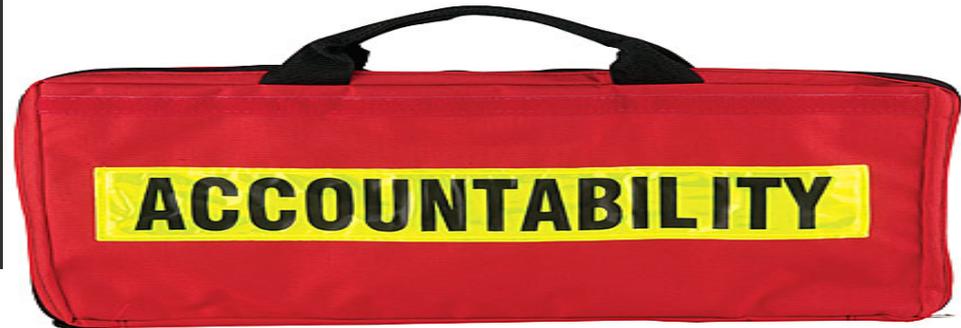
- When a technology is young enough to influence its future trajectory, you can't know where it will lead
- When a technology is mature enough for you to have a good idea of its consequences, it's too late to change it – it's *locked-in*



**RESPONSIBLE
GOVERNANCE**



RESPONSIVENESS



- From retrospective... (*accountability* and *liability*)
- ... to prospective (*care* and *responsiveness*)
- ... and collective
- Reconfiguring role responsibilities and general responsibilities
- Second-order (or meta-)responsibilities

Reconfiguring responsibility

CHALLENGE

2



**Where Are We
Going?**

Response: Responsive science

Responsible innovation needs to respond to kinds of questions that publics typically ask of scientists and innovators, or would like to see scientists ask of themselves



- a. Purposes
- b. Trust
- c. Inclusion
- d. Speed and direction
- e. Ethics and trade-offs

New lines of questioning on responsibility aligned with public concerns

| <i>Product questions</i> | <i>Process questions</i> | <i>Purpose questions</i> |
|--|--|---|
| What are the likely risks and benefits ? | How should research and innovation take place? | Why should this research be undertaken? |
| How will the risks and benefits be distributed ? | How should standards be drawn up and applied? | Why are researchers doing it? |
| What other impacts can we anticipate? | How should risks and benefits be defined and measured? | Are these motivations transparent and in the public interest? |
| How might these change in the future? | Who is in control? | Who will benefit? |
| What don't we know about? | Who is taking part? | What are they going to gain? |
| What might we never know about? | Who will take responsibility if things go wrong? | What are the alternatives? |
| | How do we know we are right? | |

Research (research and) innovation:

Anticipation

- From predictive to participatory
- Expectations and Imaginaries
- Tools
 - Anticipatory Governance
 - Vision assessment
 - Scenarios
- Barriers to anticipation
- Guston, 2012; van Lente, 1993;
- Fortun, 2005; Barben et al, 2008



Inclusion

- The 'new' scientific governance
- Dialogue and 'mini-publics'
- The challenge of legitimacy
 - Input and outputs
- Wilsdon and Willis, 2004; Grove-White et al, 1997;
- Goodin and Dryzek, 2006; Irwin et al, 2013;
- Lovbrand et al 2011



Responsible innovation

Reflexivity

- From 1st to 2nd order
- Tools
 - Codes of conduct
 - Midstream Modulation
- Wynne, 1993; Schuurbiens, 2011;
- Swiestra, 2009; Fisher et al, 2006



Responsiveness

- Answering and reacting
- Diversity and resilience
- Value-sensitive design
- De facto governance
- Political economy of innovation
- Responsibility as metagovernance
- Pellizoni, 2004; Collingridge, 1980; Friedman, 1996; Stirling, 2007; Kearnes and Rip, 2009



What is possible?

What is plausible ?

'What if' questions

What is known?

' A n t i c i p a t i o n '

Increasing resilience
Shaping agendas for socially-robust research

| Dimension | Indicative techniques and approaches | Objectives of techniques and approaches |
|--------------|---|--|
| Anticipation | Foresight Horizon scanning Scenarios Technology assessment Risk assessment Life-cycle assessment Vision assessment Socio-literary techniques | Identification and appraisal of possible and plausible impacts of research and innovation pathways |

How diverse
is the group?

How serious and
continuous is the
discussion?

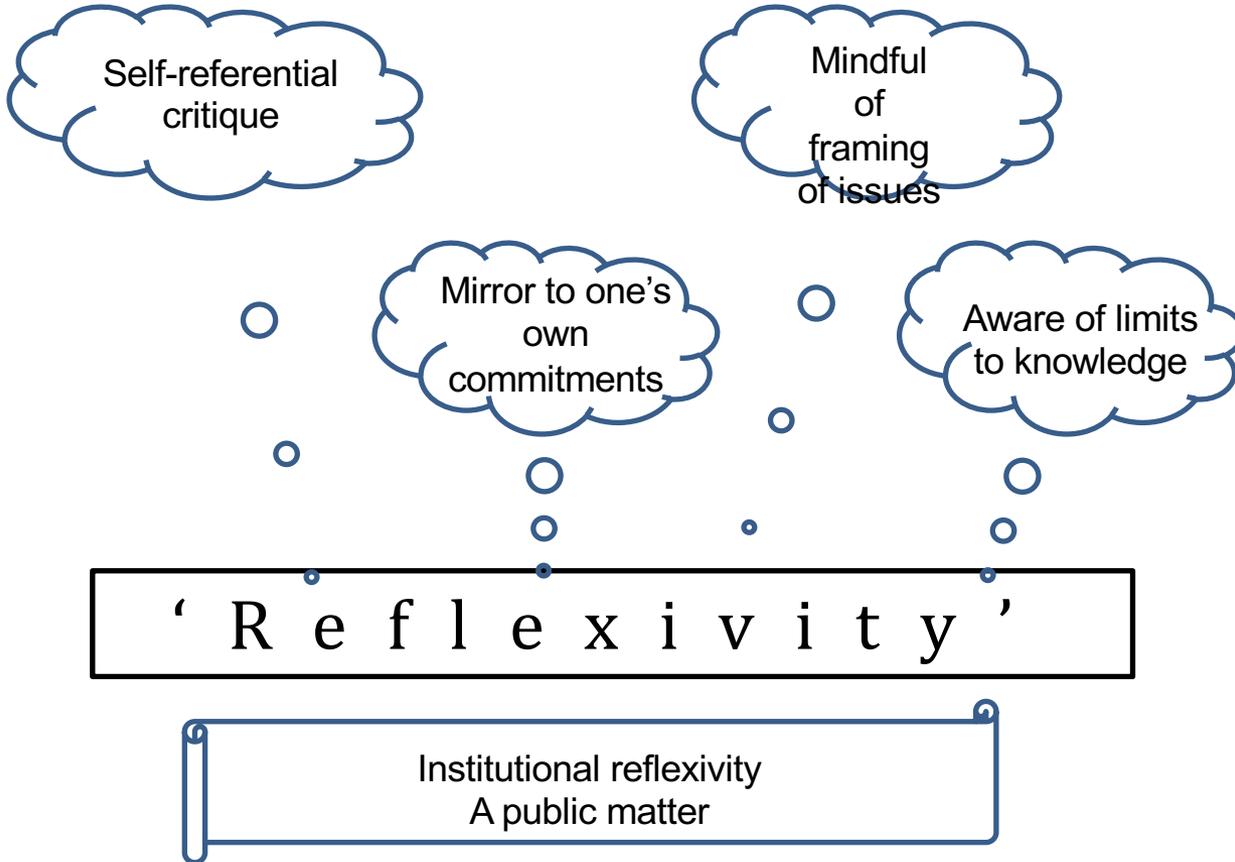
How early
are citizens
consulted?

How much
care is given
to group
design?

' I n c l u s i o n '

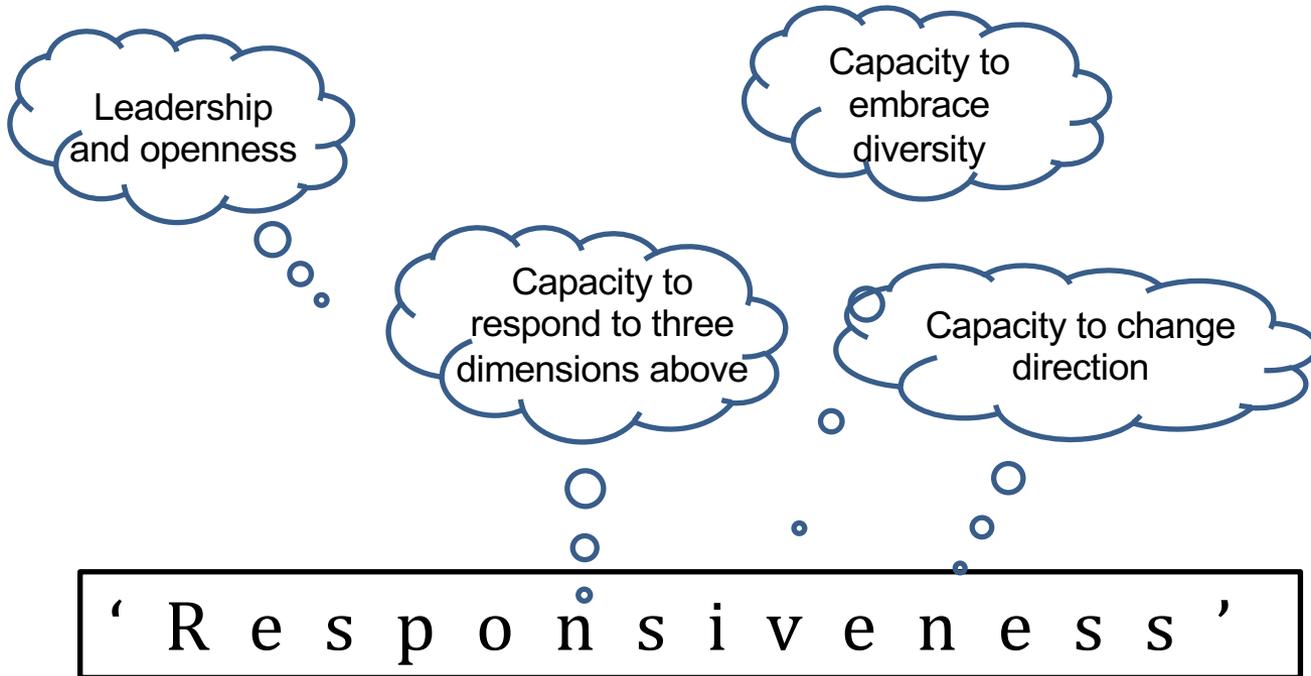
Quality of dialogue as a learning exercise

| Dimension | Indicative techniques and approaches | Objectives of techniques and approaches |
|-----------|---|--|
| Inclusion | Consensus conferences Citizen assemblies Focus groups Science shops Deliberative mapping Multi-stakeholder partnerships Lay membership of expert bodies User-centred design Open innovation | Public and stakeholder deliberation on the visions, impacts and broader socio-economic questions associated with research and innovation |



| Dimension | Indicative techniques and approaches | Objectives of techniques and approaches |
|-----------|--------------------------------------|---|
|-----------|--------------------------------------|---|

| | | |
|-------------|--|---|
| Reflexivity | Multidisciplinary collaboration and training Embedded social scientists and ethicists in laboratories Mid-stream modulation Ethical technology assessment | Socio-technical integration and interdisciplinarity in research and innovation practice |
|-------------|--|---|



Commitment to the public interest
Alignment of actors

| Dimension | Indicative techniques and approaches | Objectives of techniques and approaches |
|----------------|--|---|
| Responsiveness | Constitution of grand challenges and thematic research programmes Regulation and standards Open access and other mechanisms of transparency Niche management Value-sensitive design Moratoriums Stage-gates Codes of conduct Alternative intellectual property regimes | Policy and governance mechanisms for the practical implementation of responsible innovation |

'Formal Adoption by EPSRC in 2013'

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RESEARCH

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- Facilities and equipment ▾
- Centres and major investments ▾
- Case studies
- Partnerships ▾
- Framework for Responsible Innovation ▲
- Anticipate, reflect, engage and act (AREA)
- Support
- Expectations
- Acknowledgements and resources

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FRAMEWORK FOR RESPONSIBLE

INNOVATION

EPSRC is committed to develop and promote Responsible Innovation. This site reaffirms our own commitment and sets out our expectations for the researchers we fund and their research organisations.

INTRODUCTION

Responsible Innovation is a process that seeks to promote creativity and opportunities for science and innovation that are socially desirable and undertaken in the public interest. Responsible Innovation acknowledges, that innovation can raise questions and dilemmas, is often ambiguous in terms of purposes and motivations and unpredictable in terms of impacts, beneficial or otherwise. Responsible Innovation creates spaces and processes to explore these aspects of innovation in an open, inclusive and timely way. This is a collective responsibility, where funders, researchers, stakeholders and the public all have an important role to play. It includes, but goes beyond, considerations of risk and regulation, important though these are.

As a public funder of research, we have a responsibility to ensure that our activities and the research we fund, are aligned with the principles of Responsible Innovation, creating value for society in an ethical and responsible way. EPSRC does not wish to be prescriptive about how Responsible Innovation is embedded in the research and innovation process. We recognise that some researchers are already well engaged

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Home > Research > Framework for Responsible Innovation > Anticipate, reflect, engage and act (AREA)

ANTICIPATE, REFLECT, ENGAGE AND ACT (AREA)

A Responsible Innovation approach should be one that continuously seeks to:

Anticipate – describing and analysing the impacts, intended or otherwise, (e.g. economic, social, environmental) that might arise. This does not seek to predict but rather to support an exploration of possible impacts and implications that may otherwise remain uncovered and little discussed.

Reflect – reflecting on the purposes of, motivations for and potential implications of the research, and the associated uncertainties, areas of ignorance, assumptions, framings, questions, dilemmas and social transformations these may bring.

Engage – opening up such visions, impacts and questioning to broader deliberation, dialogue, engagement and debate in an inclusive way.

Act – using these processes to influence the direction and trajectory of the research and innovation process itself.

Dynamics of institutionalisation at the EPSRC

- 2013–2018
 - Institutionalisation of RI partial and limited in both scope and reach
 - 2018–
 - 2019 Delivery Plan featured RI comprehensively
 - work stream in its Strategic Advisory Network to consider the strategic direction for RI
 - Centres for Doctoral Training (115)
 - Mandatory part of training (following 2016 mid-term review)
 - Opportunity for further embedding of RI in doctoral programmes in ways that are substantive, meaningful, creative, adequately resourced and supported by supervisors
 - Synthetic Biology Research Centres
 - Instances of experimentation around RI as an integrated approach
-
- Practices
 - How and why do OLD practices and behaviours persist?
 - How and why do OLD practices and behaviours fade?
 - How and why are OLD practices and behaviours modified?
 - How and why do NEW practices and behaviours emerge?
 - How and why do NEW practices and behaviours spread?
 - How can responsible innovation practices and behaviours be encouraged?
 - Forces
 - Legitimation
 - Entrepreneurship
 - Decoupling
 - Encountered competing
 - Institutional logics
 - Responsibility norms
 - Epistemic practices
 - RI as a decadal project



Take home messages

1. Responsibility is about doing science with and for society
2. Responsible innovation is not simply about risk as defined by institutional science
 - It is also about innovation, about the kinds of society we value and wish science and innovation processes to collectively contribute towards
 - It is also about control, about who will take responsibility if things go wrong
3. The need for public engagement research to seek to determine the frames of reference from within people's own lifeworld
4. AIRR dimensions are a template for implementation



Thank you
