



The role of the university in turbulent times: Navigating the conversation
between today and tomorrow in pursuit of sustainability

Phil Macnaghten

Higher Education Management for Sustainable Universities – 20 Years of Dialogue
on Innovative Higher Education Strategies: November 09/10, 2021 (online)

The talk

- A sustainable university
 - Responsibility 1.0 scientific integrity
 - Responsibility 2.0 science for society
 - Responsibility 3.0 science with and for society
- A framework of responsible innovation
- Next steps for dialogue in turbulent times





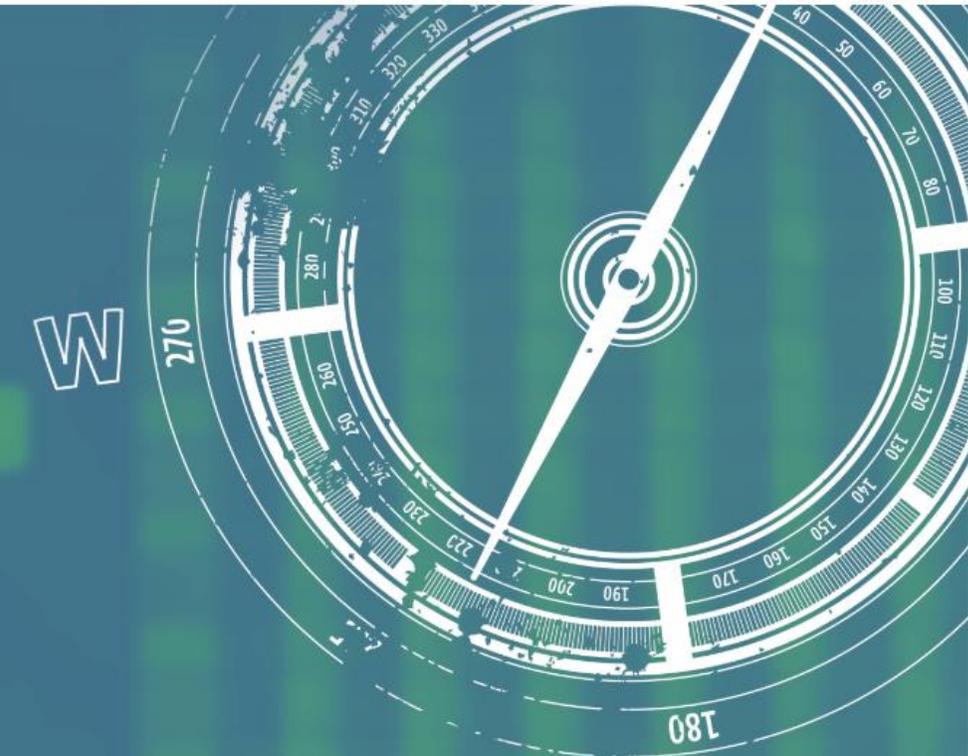
Responsibility
1.0 science
with integrity

Robert Merton, 1942: To produce reliable (and reproducible) 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

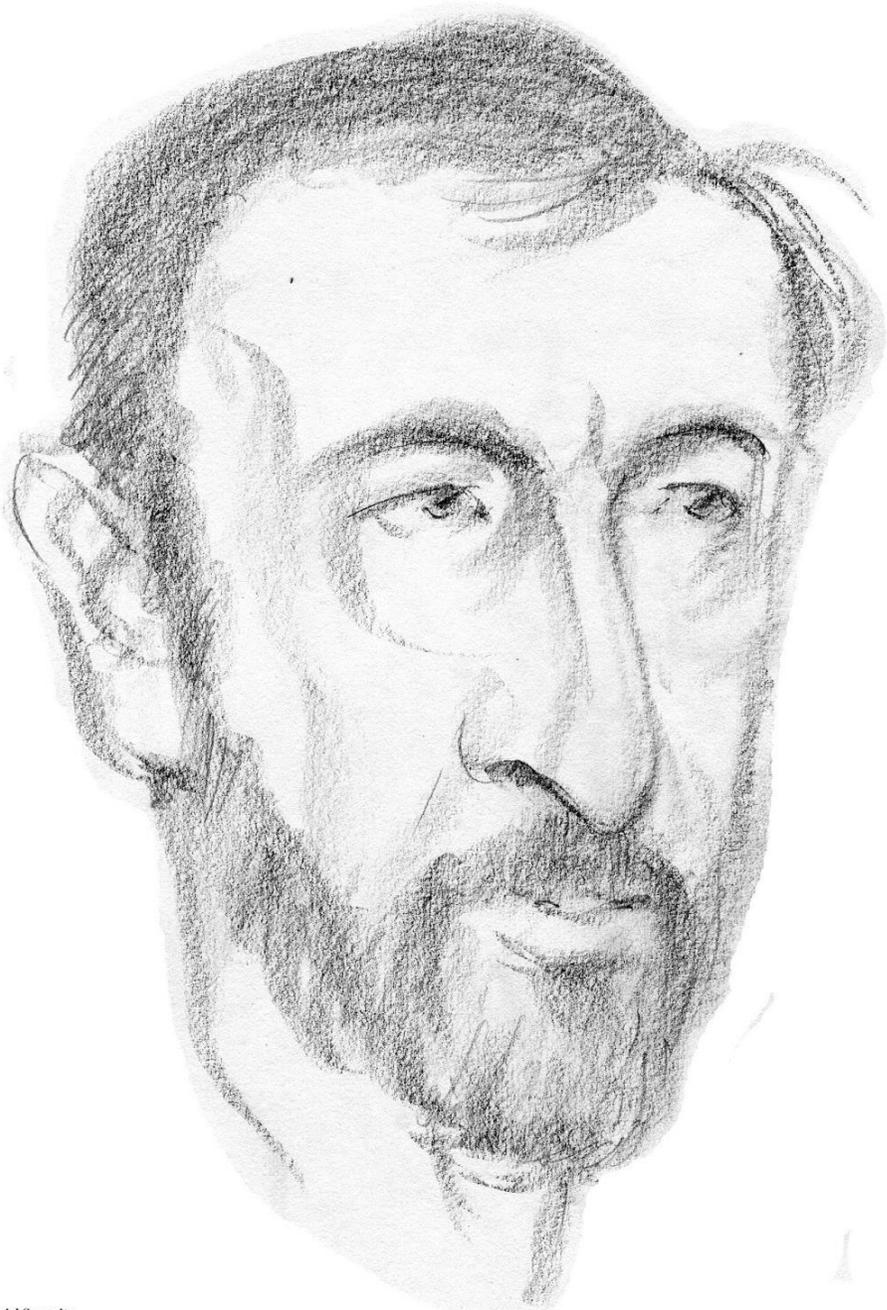
2018

-
- ✓ 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.”



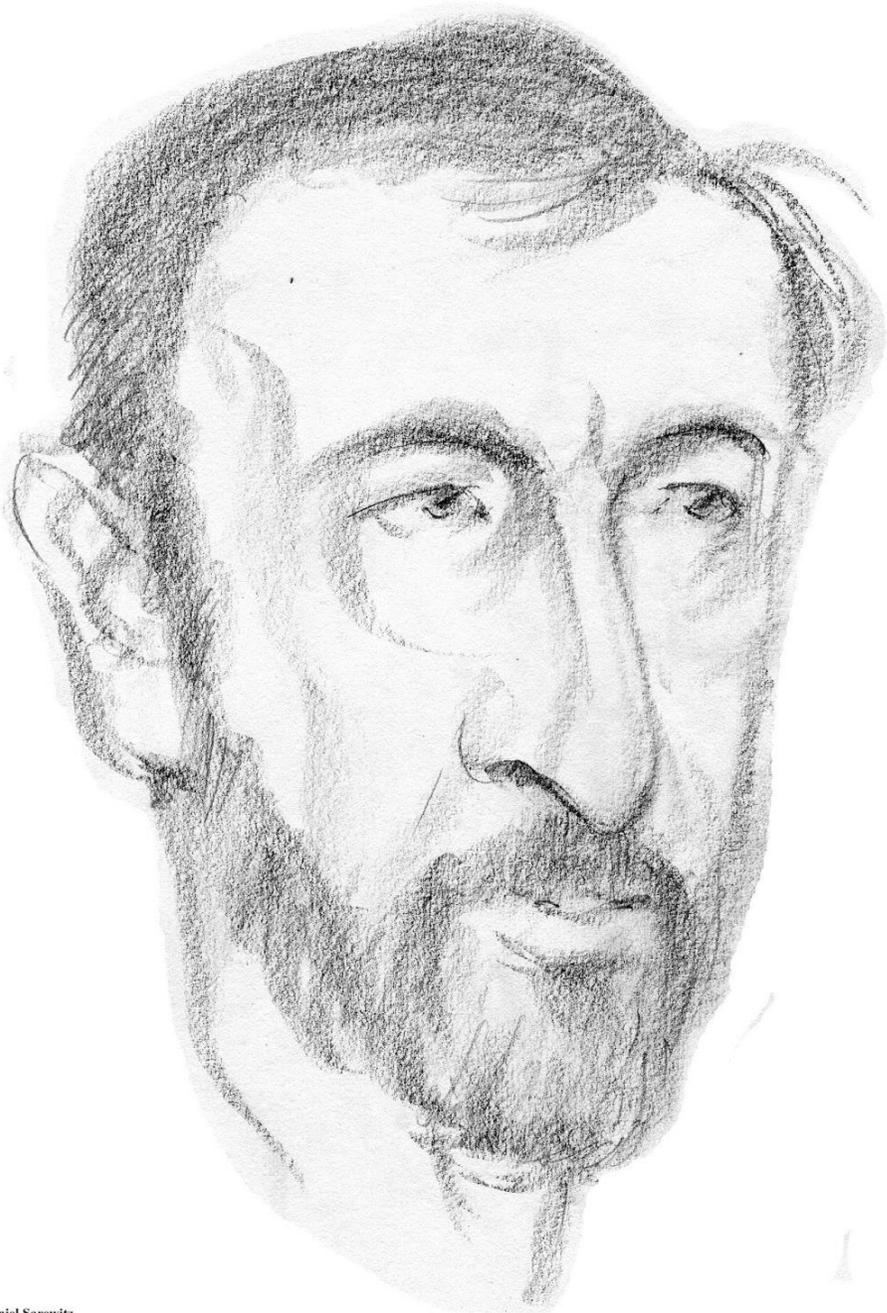
Responsibility 1.0: Supporting people

- ✓ Equality
- ✓ Diversity
- ✓ Inclusion



The five myths

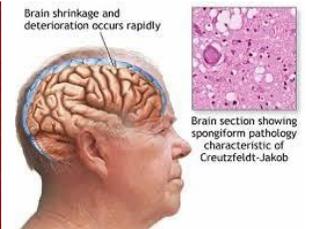
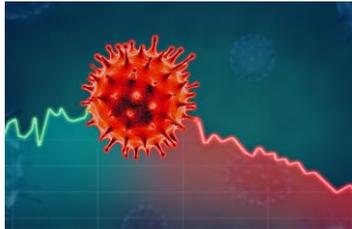
- I. Myth of infinite benefit
 - ✓ investing in science inevitably leads to benefits in society
- II. Myth of unfettered research
 - ✓ science is most productive without societal interference
- III. Myth of accountability
 - ✓ science can and should police itself
- IV. Myth of authority
 - ✓ scientists know best
- V. Myth of the endless frontier
 - ✓ science embodies the human desire to grasp the underlying workings of nature

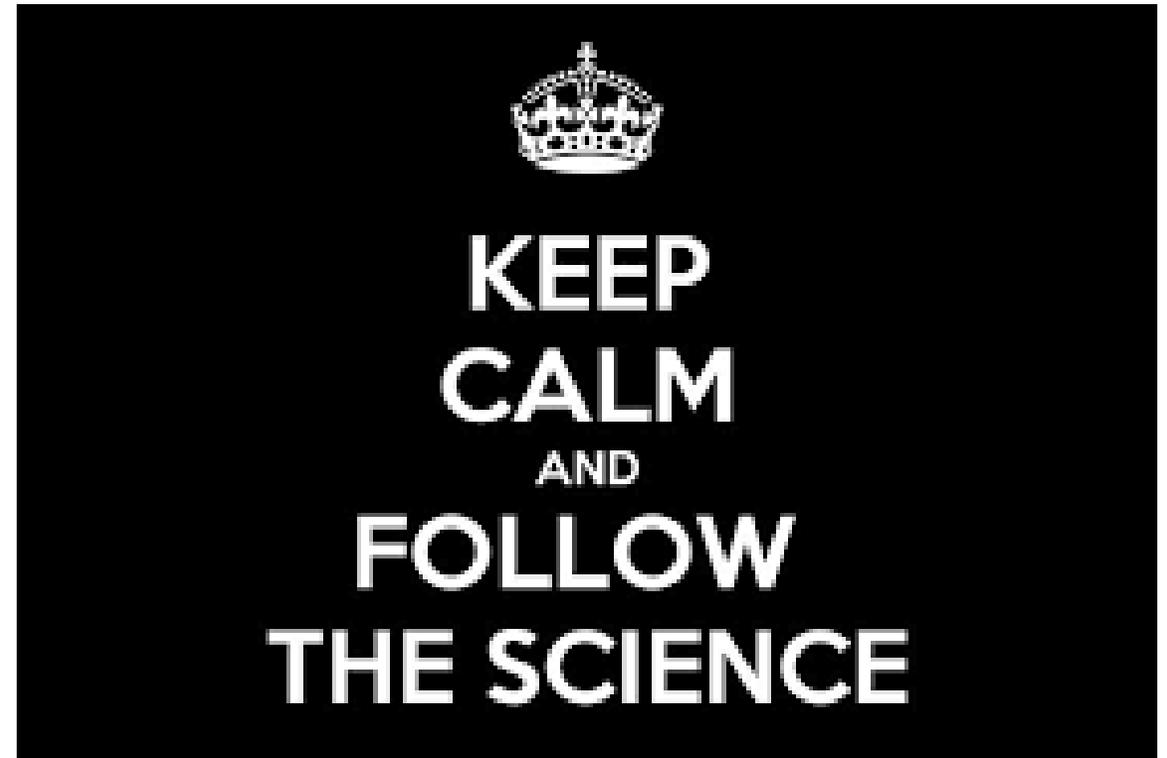


The five myths (revisited)

- I. Myth of infinite benefit
 - ✓ investing in science inevitably leads to benefits in society
 - ❖ what about scientific controversies?
 - ❖ can/ should they have been anticipated?
- II. Myth of unfettered research
 - ✓ science is most productive without societal interference
 - ❖ what does the evidence say? who should set scientific priorities?
- III. Myth of accountability
 - ✓ science can and should police itself
 - ❖ is it competent to do so?
- IV. Myth of authority
 - ✓ scientists know best
 - ❖ what is the role for local or indigenous knowledge?
- V. Myth of the endless frontier
 - ✓ science embodies the human desire to grasp the underlying workings of nature
 - ❖ what, if any, is the role of values? Are not values part of the scientific endeavour?

Scientific controversies





Science-based policy?

The Lund Declaration 2015

EUROPE MUST SPEED UP SOLUTIONS TO TACKLE GRAND CHALLENGES THROUGH ALIGNMENT, RESEARCH, GLOBAL COOPERATION AND ACHIEVING IMPACT

The Lund Declaration 2009 called upon Member States and European Institutions to focus research on the grand challenges of our times by moving beyond rigid thematic approaches and aligning European and national strategies and instruments. During the last six years European institutions, member states and associated countries have taken important steps to align and coordinate resources and shift the focus towards society's major challenges.

Today Europe still faces a wide range of major challenges and business as usual is not an option. The Lund Declaration 2015 therefore emphasises the urgency of increased efforts in alignment at national and European level and that investments in research and innovation better and more rapidly be exploited to the benefit of society.

It identifies four priority areas, each with defined priority actions, and calls on all stakeholders to take these priorities into account in their field of responsibility.

Responsibility
2.0 science for
society

Pillar 1

Excellent Science

European Research Council

Marie Skłodowska-Curie
Actions

Research Infrastructures

Pillar 2

Global Challenges and
European Industrial
Competitiveness

Clusters

- Health
- Culture, Creativity and Inclusive Society
- Civil Security for Society
- Digital, Industry and Space
- Climate, Energy and Mobility
- Food, Bioeconomy, Natural Resources, Agriculture and Environment

Joint Research Centre

Pillar 3

Innovative Europe

European Innovation Council

European innovation
ecosystems

European Institute of
Innovation
and Technology

Widening Participation and Strengthening the European Research Area

Widening participation and spreading excellence

Reforming and Enhancing the European R&I system

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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SUSTAINABLE DEVELOPMENT GOALS

1 NO POVERTY

2 ZERO HUNGER

3 GOOD HEALTH AND WELL-BEING

4 QUALITY EDUCATION

5 GENDER EQUALITY

6 CLEAN WATER AND SANITATION

7 AFFORDABLE AND CLEAN ENERGY

8 DECENT WORK AND ECONOMIC GROWTH

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

10 REDUCED INEQUALITIES

11 SUSTAINABLE CITIES AND COMMUNITIES

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

13 CLIMATE ACTION

14 LIFE BELOW WATER

15 LIFE ON LAND

16 PEACE, JUSTICE AND STRONG INSTITUTIONS

17 PARTNERSHIPS FOR THE GOALS


SUSTAINABLE DEVELOPMENT GOALS

Context for internalisation

- Collective problems we face are global and interconnected
 - ✓ Solutions also need to be global and interconnected
- New (digital) technologies provide radical new opportunities
- Internalisation is predicated on goals and values that need to be cherished
 - ✓ Commitment to excellence (research and education) and to realising potential (of science and individuals)
 - ✓ Commitment to do our part to benefit science, industry, and society
 - ✓ Commitment to the productive and peaceful development of our planet
 - ✓ Commitment to capacity building and expanding the academic base
- Yet most public funding (still) tends to be national

Is 'science for society'
sufficient?

'Does new science and
innovation not create new
dilemmas and challenges?'

'Does society not define
grand challenges in plural
ways?'



Grand challenges as
“wicked problems”

The politics of scientific
knowledge: whose
knowledge and with
what (seen and
unforeseen) effects)

- ✓ Difficult or impossible to solve
- ✓ Can legitimately be defined in different ways
- ✓ Stakeholders have radically different world views and different frames for understanding the problem
- ✓ Often have no clear precedent
- ✓ Nor a clear solution or goal state
- ✓ Every problem is a symptom of another problem

Examples

- Climate change
- Eradication of exogenous pests
- Food security
- Genetically modified foods
- Nuclear energy
- Obesity
- Offshore oil prospecting
- Pandemic influenza
- Reduction of agricultural greenhouse gases
- Social injustice
- Water quality



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)



What is responsible innovation?

- “Helping society to get better at the conversation between today and tomorrow”

(Robert Madelin: 2016)



What is responsible innovation?

“The future could be otherwise”
(Alan Irwin 2016)



What is responsible innovation?

“We have delegated ‘what is good’ to the market”
(Rene von Schomberg: 2016)

A (radical) rationale for RRI

“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”

1. What is 'responsible innovation' – and what is different about it?
2. Why is it important – and why now?
3. Implications for UK research councils?



Richard Owen

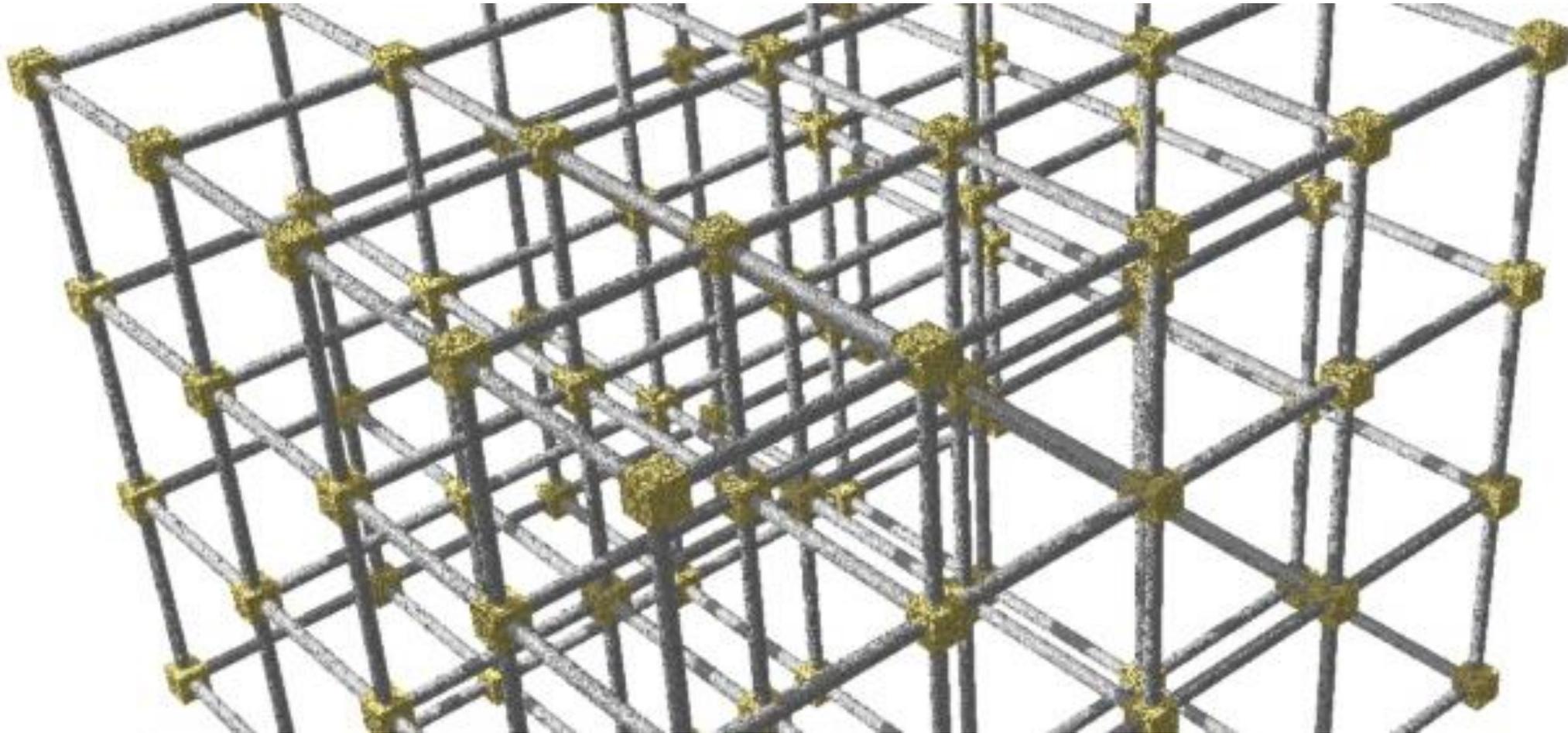


Jack Stilgoe



Phil Macnaghten

A framework for responsible science governance

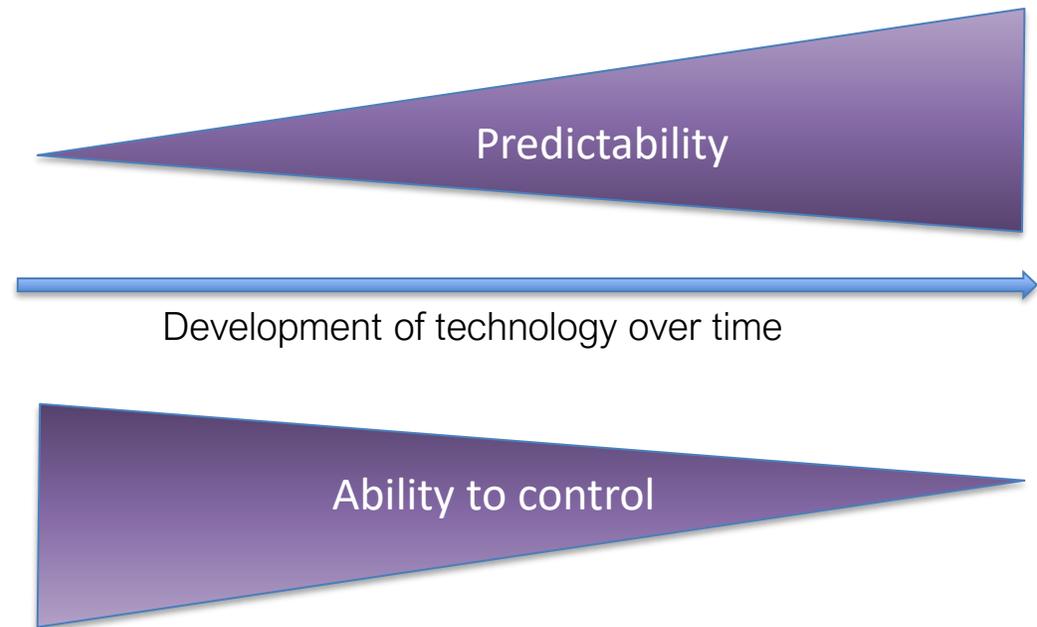


CHALLENGE

1

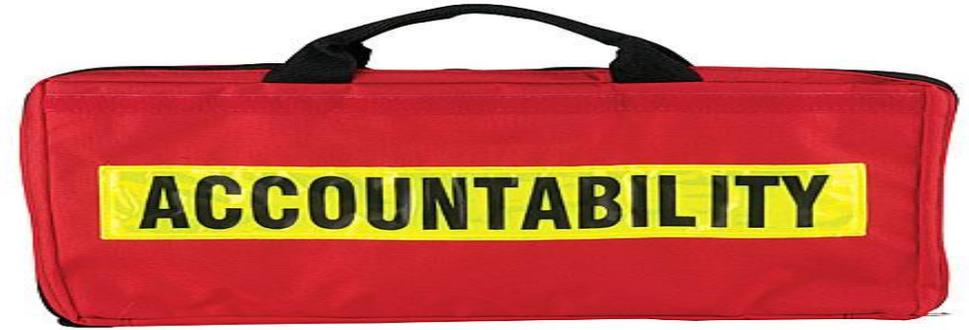
Collingridge's control dilemma

- 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



Modes of responsibility in science 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



**Where Are We
Going?**



legitimacy

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

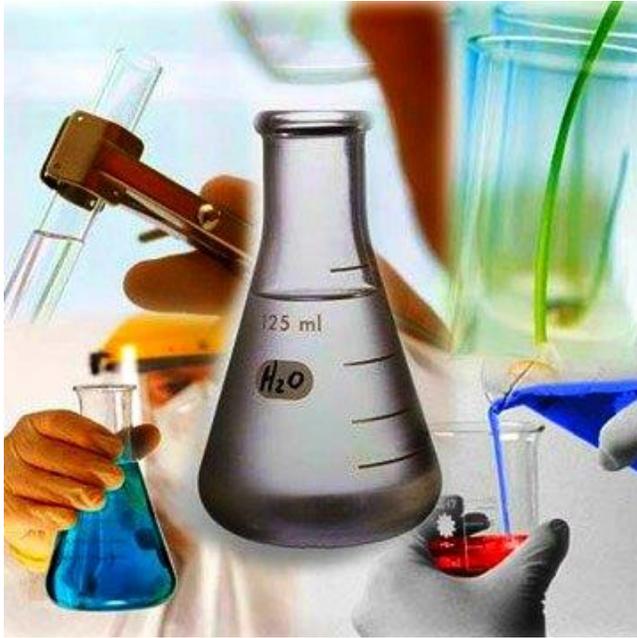


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Response: responsive science

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?	

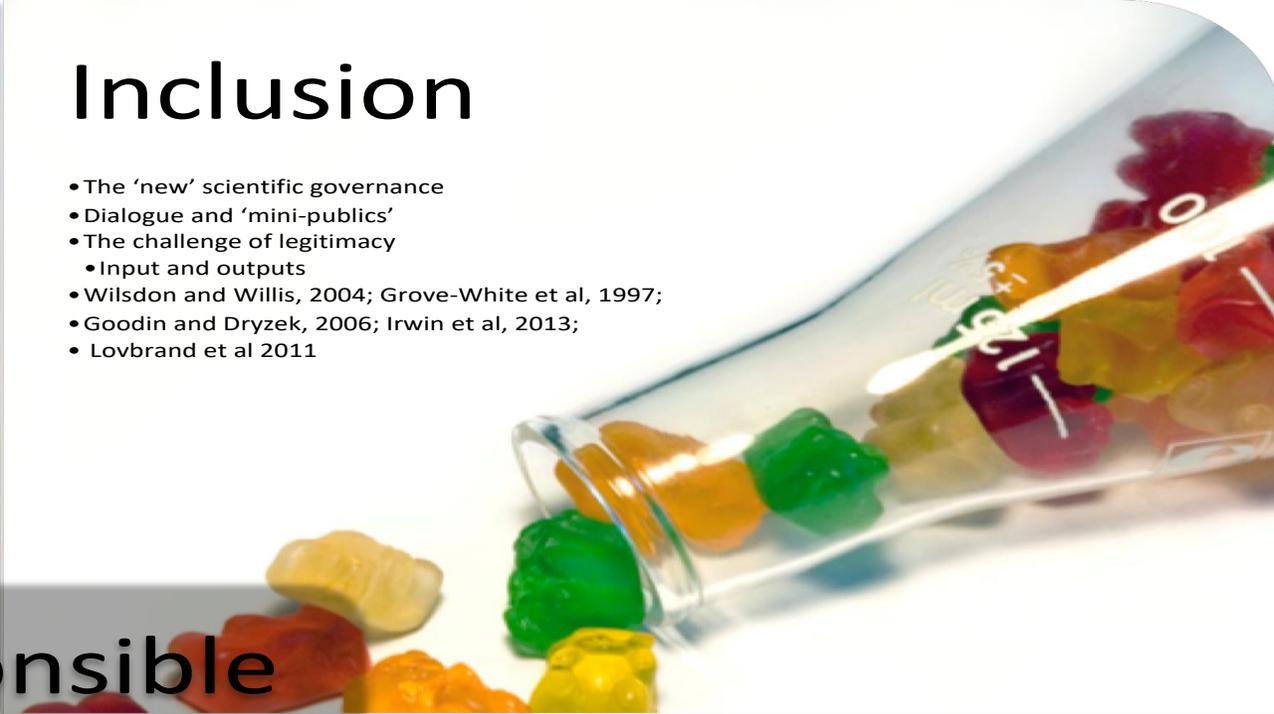
Anticipation

- 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

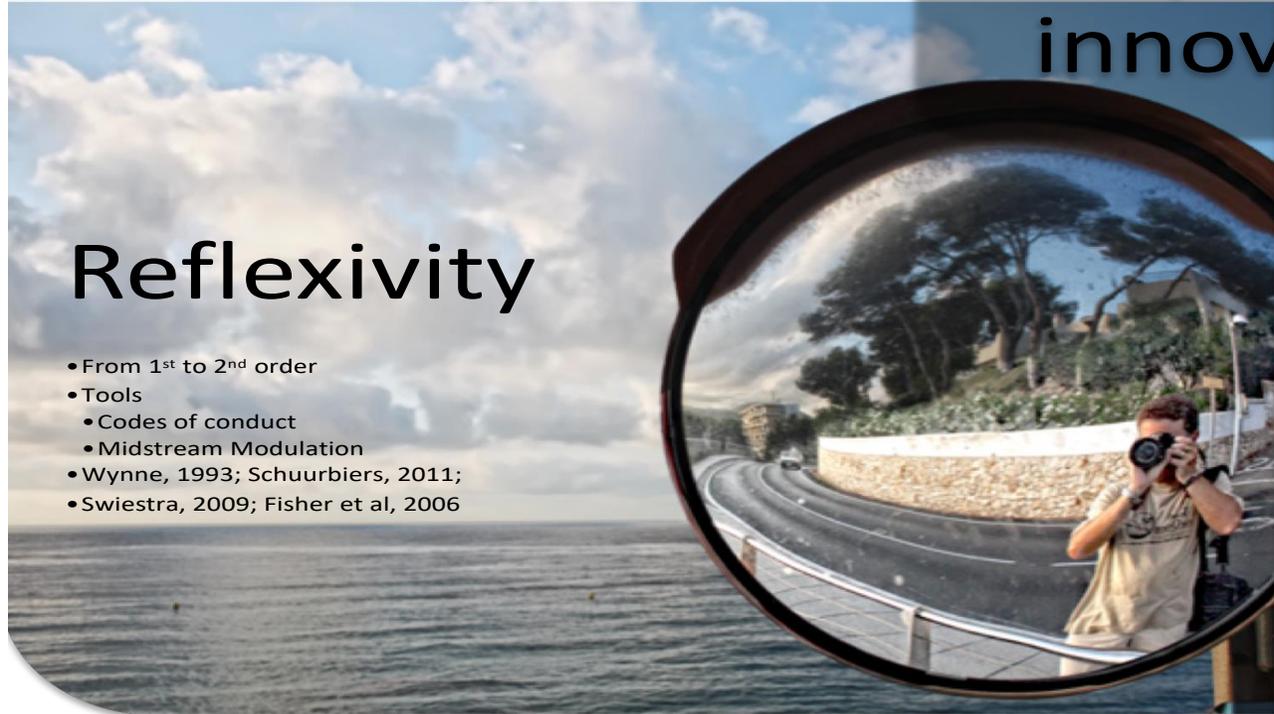
- The 'new' scientific governance
- Dialogue and 'mini-publics'
- The challenge of legitimacy
 - Input and outputs
- Wilsdon and Willis, 2004; Grove-White et al, 1997;
- Goodin and Dryzek, 2006; Irwin et al, 2013;
- Lovbrand et al 2011



Responsible innovation

Reflexivity

- From 1st to 2nd order
- Tools
 - Codes of conduct
 - Midstream Modulation
- Wynne, 1993; Schuurbiers, 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?

' Anticipation '

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
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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
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Self-referential
critique

Mindful of
framing of
issues

Mirror to one's
own
commitments

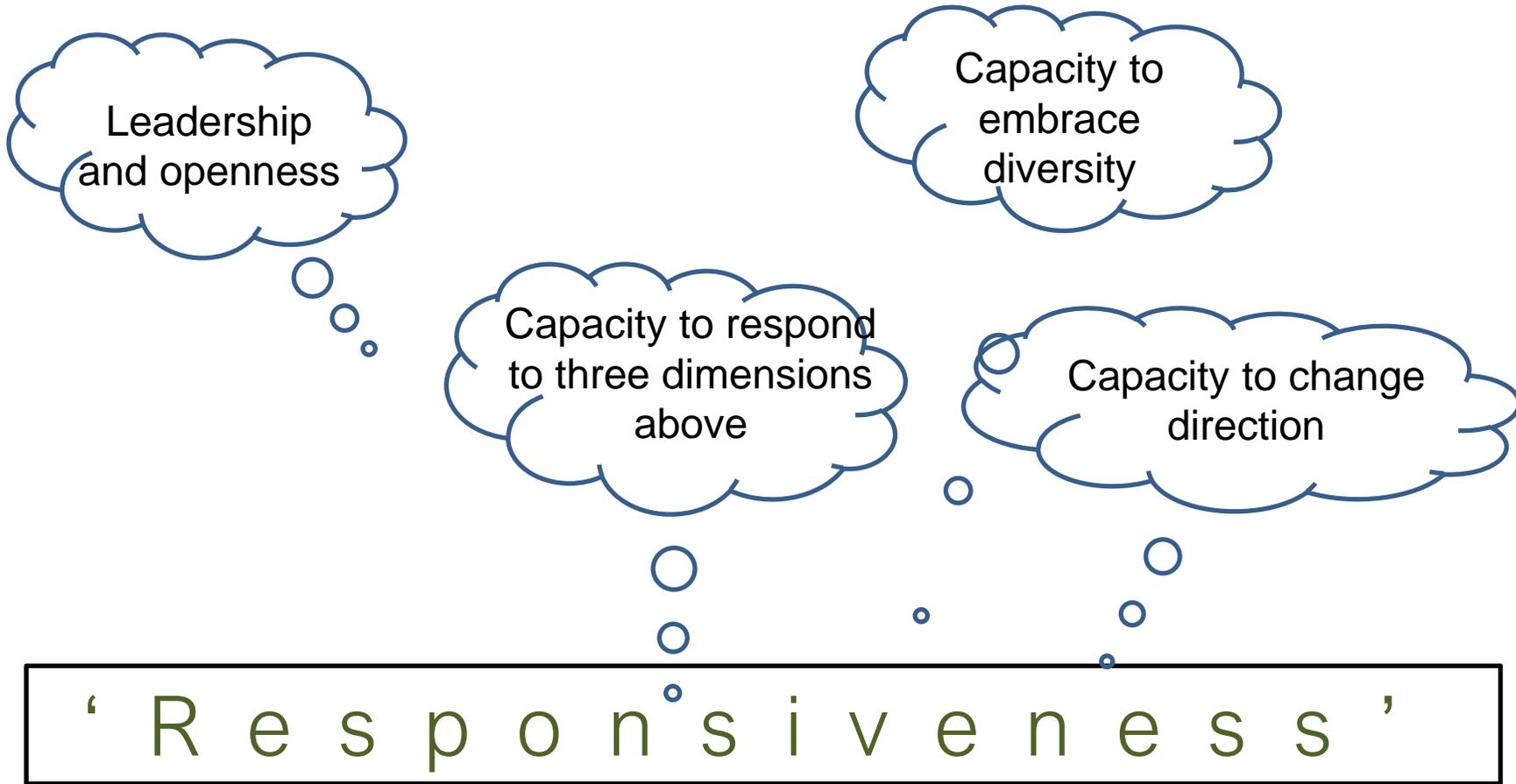
Aware of limits to
knowledge

' R e f l e x i v i t y '

Institutional reflexivity
A public matter

Dimension	Indicative techniques and approaches	Objectives of techniques and approaches
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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
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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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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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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.

Collaborative Project for Technological Convergence Related to Enabling Technologies



Assessment criteria

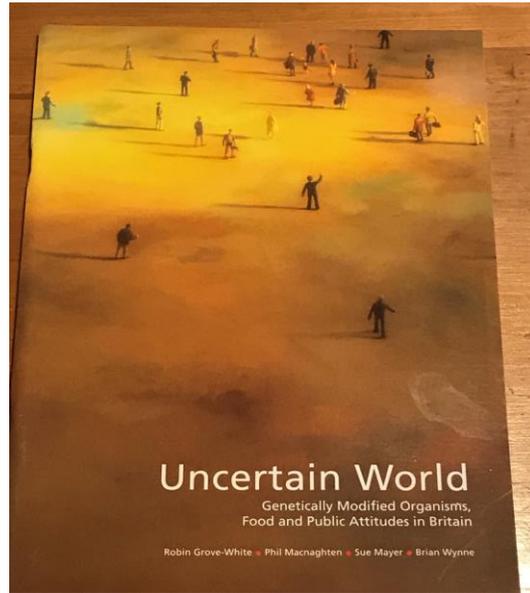
- Excellence
- Impact
- Implementation
- Responsible innovation
 - ✓ reflections on intentional and unintentional impacts of the technologies they are developing
 - ✓ involve relevant stakeholders in these activities



A wide-angle photograph of a coastal dune landscape. In the foreground, a wooden boardwalk made of light-colored planks curves from the bottom center towards the middle ground. The boardwalk is flanked by tall, green grasses. In the background, there are rolling sand dunes with patches of green vegetation and some exposed sand. The sky is overcast with grey clouds. The text "Next Steps for responsible innovation and internationalisation" is overlaid in white, sans-serif font across the middle of the image.

Next Steps for responsible innovation
and internationalisation





Understanding public attitudes



Global lessons from GM crops



Dialogues on gene editing in livestock

Dialogues on responsible innovation on the biosciences



United Nations
Climate Change

The different

futures that

lie ahead.

+1.5 °C

+2 °C

+3 °C





With funders



With universities



With training

Institutional embedding

Thanks

