NTNU – Trondheim
Norwegian University of
Science and Technology

From Ethical, Legal, and Social Aspects (ELSA) to Responsible Research and Innovation (RRI)

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Overview and structure

1. Contextualize RRI/ELSA within larger societal, political developments
2. History and definition of ELSA research
3. ELSA within nanosciences and nanotechnology – responsible development of nanotechnology
4. Responsible Research and Innovation (RRI)

Now

1 Historical context - environmentalism

- Detrimental effects of industrialization
- Rising environmental consciousness
- Environmental movements and protests
- Institutionalization of environmental protection

1 Risk society

Anthony Giddens, Ulrich Beck

Modern societies are exposed to and have to prevent hazards that are the results of the modernization process itself.

→ Reflexive modernization:

- Sustainability
- Precaution

1 Late Lessons from Early Warnings

“The growing innovative powers of science seem to be outstripping its ability to predict the consequences of its applications, whilst the scale of human interventions in nature increases the chances that hazardous impacts may be serious and global.”

(European Environmental Agency)

1 Three examples of late lessons

- Asbestos
  - unforeseen long-term risks, painstakingly long evidence-gathering
- Mad cow disease - BSE-crisis
  - loss of trust in the political authorities that should control science
- Genetically modified organisms (GMO)
  - uncertainty, moral objections: human kind shall not intervene in nature (do not play God), ecological concerns, economy & power

1 Other issues than risks in the GM controversy:

- Potential for unforeseen ecological consequences
- Forms of agriculture - imaginations
- Global drives towards new forms of proprietary knowledge
- Shifting patterns of ownership and control in food chains
- Lobbying, profit interests
- Intensifying relationship of science and scientists with the worlds of power and commerce
- Unease about hubristic approaches to limits in human understanding
- Conflicting interpretations of what might be meant by sustainable development

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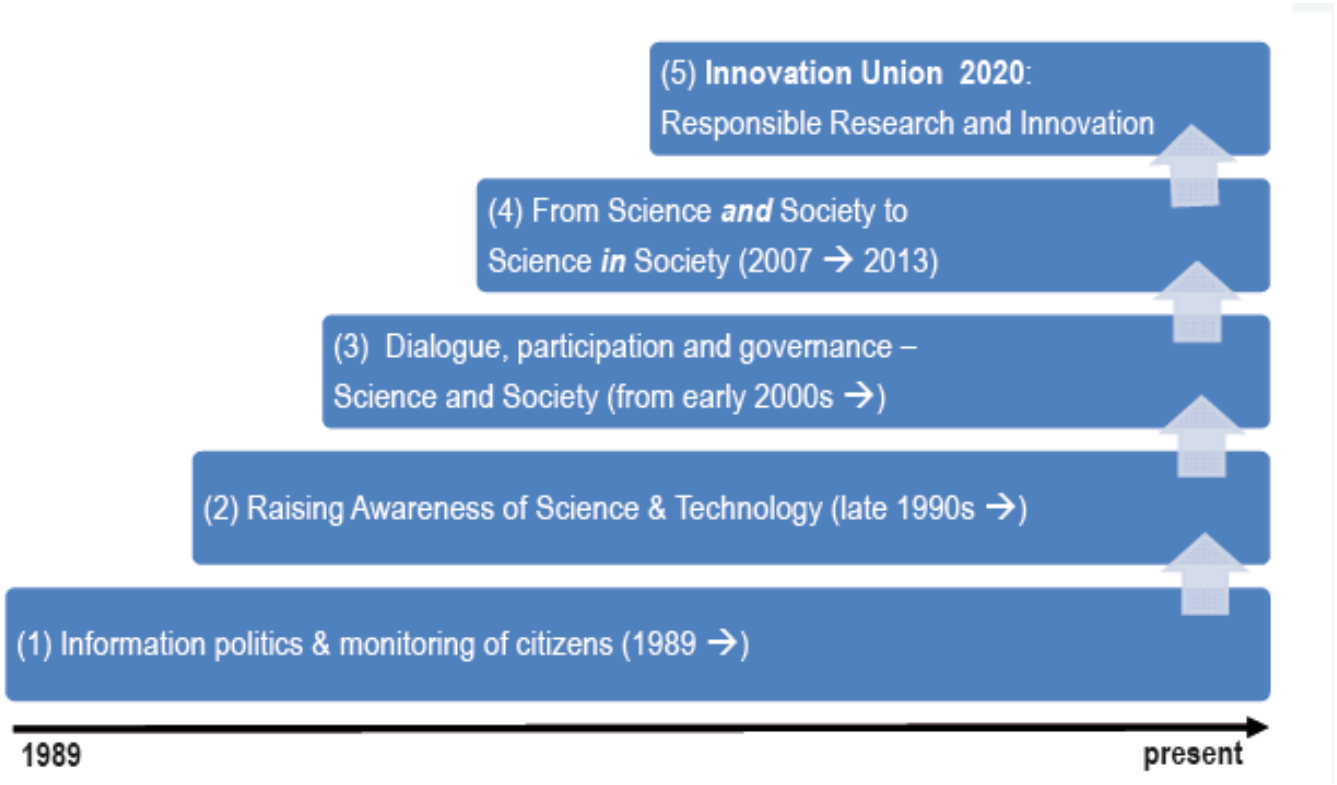
2 New Politics of Science and Society

- ✓ Research on ethical, legal, and social aspects (ELSA) of science became a legitimate and expected feature in policy-making of technology governance
- ✓ Belief in democratization of science and society relations.
- ✓ Ideas of dialogue, openness, and transparency
- ✓ Society shall come in **early**; societal concerns shall be **integrated**

Science Policy Layers

Figure 1.
Layers in the EU policy discourse on 'science-society' issues (Felt 2010)



2 Where does ELSA research come from?

- Human Genome Project
- Bioethics --- > ELSA
  1964 Helsinki declaration, medical ethic committees, informed consent

- Technology Assessment: from the hindsight to constructive technology assessment/participatory technology assessment

- Science and technology studies: from “public understanding of science” to “public engagement”; socially robust knowledge …

- Political Science: governance, deliberative democracy

2 ELSA research not a field but a research practice characterized by …

- Proximity to large emerging technoscientific programs, such as nanotechnology, biotechnology, and synthetic biology
- An anticipatory, forward-looking approach; a focus on the agenda-setting and design stages of innovation trajectories, rather than on the product stage
- Interaction with a broad range of stakeholders (media, policy, NGO, industry) as integral part of the research
- Interdisciplinarity: ELSA research as a converging field involving a broad range of disciplines (philosophy of science, bioethics, social science, TA, STS, innovation studies, science communication etc.)
- A focus on micro-analysis (“case studies”) rather than on macro analysis (socio-economic studies)
- A tendency to draw on a wide variety of sources: from academic philosophy via policy reports to media coverage of public debates and genres of the imagination (novels, plays, movies and the like)

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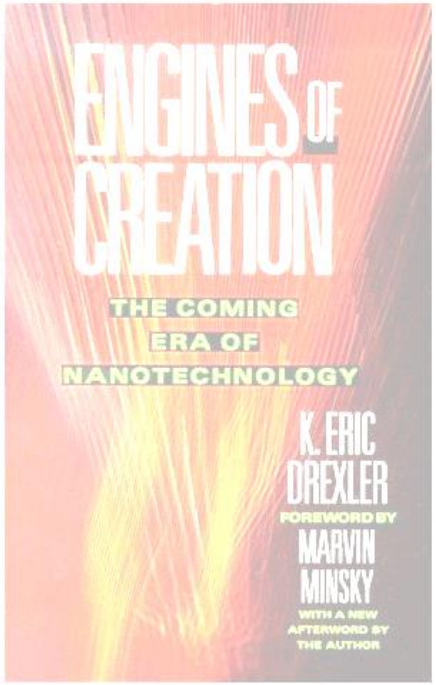
3 Nanotechnology: a promising technology for the next industrial revolution

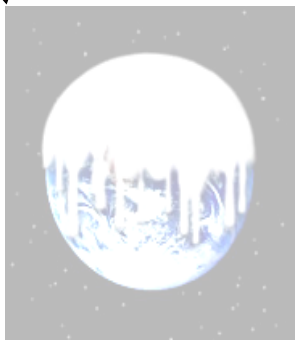
… = an important narrative since the 90ies.

Trondheim's version of this narrative:

- https://teknologihovedstaden.no/en/videos/nanoteknologi

3 2003: Nanotechnology politicised





3 «Getting it right the first time»

- «nanophobia-phobia» (Rip 2006)

“That nanotechnology became a big issue in the VCI originated from the communications department, which drew our attention to reports in the media occurring now and then in the year 2004 reporting that nanomaterials might be dangerous. The communications department pointed out that we might again have such a technology … like a cascade: nuclear technology, biotechnology, nanotechnology.

So, we decided in the presidium that […] we would coordinate the work, attend stakeholder dialogues, participate in citizen conferences, and we decided to initiate regular roundtables to which we invited the press. This developed because we wanted to do it right this time with nanotechnology. (Interview material: Association of Chemical Engineers)

3 ELSA within nano

- US: 2001 National Nanotechnology Initiative (NNI) – Roco & Bainbridge

- 2003 US Congress passed legislation to regulate the NNI:

  All NNI research should "insofar as possible, integrate research on societal, ethical and environmental concerns with nanotechnology research and development" (Public Law 108-153, 2003)

3 Royal Society Nanotechnology Report

«responsible development of nanotechnologies»

- Particular composition of working group
- Transparent: all evidence pubished online
- Focus on uncertainty and social aspects

3 European Commission – 2009 CoC

- Public engagement

but also:

3.7 Accountability

Researchers and research organisations should remain accountable for the social, environmental and human health impacts that their N&N research may impose on present and future generations.

- Responsible development of nanotechnology
- Implemented EU's Code of Conduct for Responsible Development of NT
- Integration of HES & ELSA
- Public dialogue and engagement

Summary

- ✓ Nanotechnology politics, key documents
- ✓ Ideas of democratization of science governance
- ✓ Introduce term ELSA

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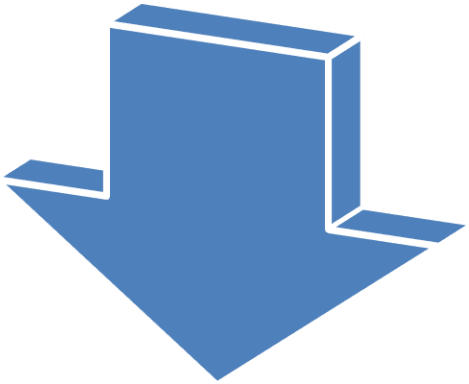
Responsible research and innovation is an approach that **anticipates** and assesses potential **implications** and societal expectations with regard to research and innovation, with the aim to foster the design of **inclusive** and **sustainable** research and innovation.

Responsible Research and Innovation (RRI) implies that **societal actors** (researchers, citizens, policy makers, business, third sector organisations, etc.) **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 society.

4



ELSA
Toxicology
Ethics
Responsibility
Precaution
…

RESPONSIBLE RESEARCH AND INNOVATION

Innovation
Translation
Proactive
Value
Societal Challenges

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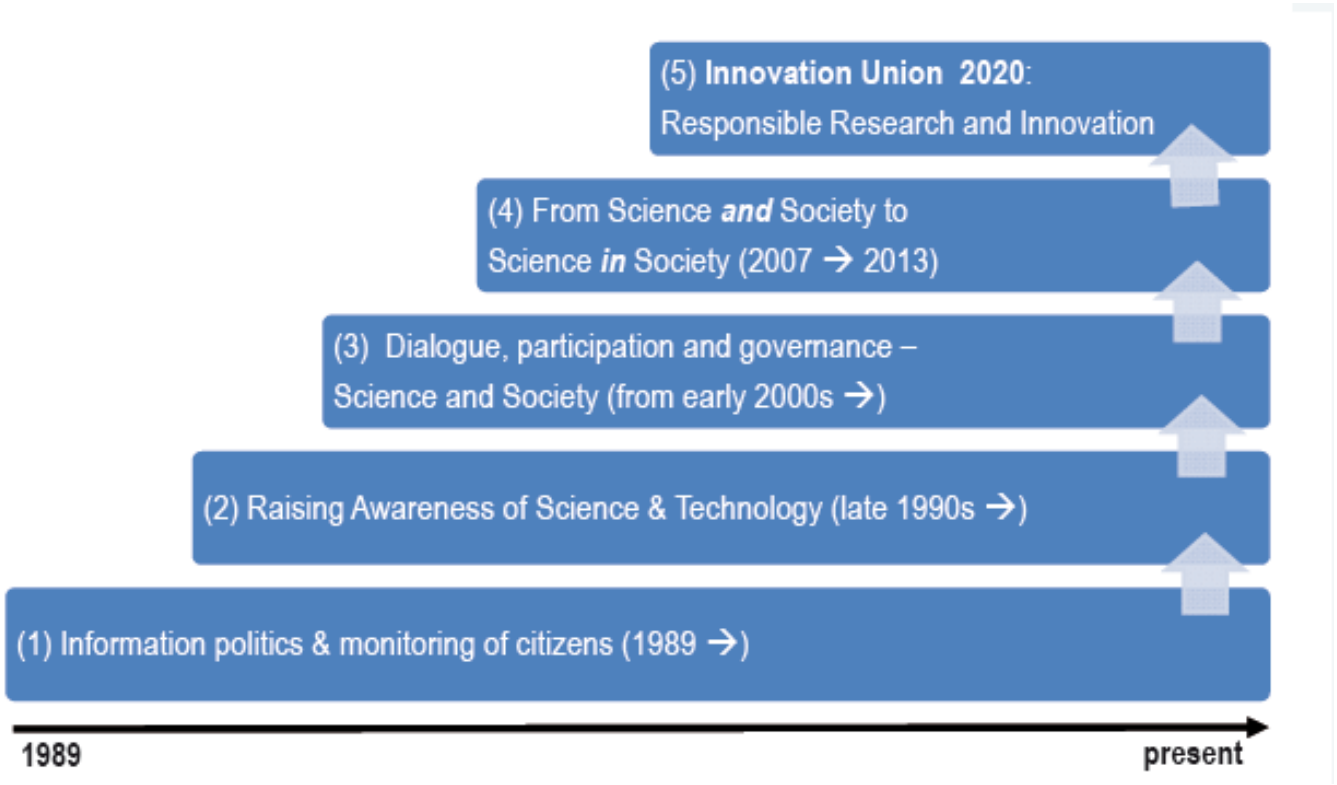


RRI – a policy idea

… to actively govern the relationships among research, innovation, and society

RRI: *What do we want science and innovation to do (not only what do we not want them to do).* (Owen, Stilgoe, Macnaghten, Gorman, Fisher and Guston 2013:28f)

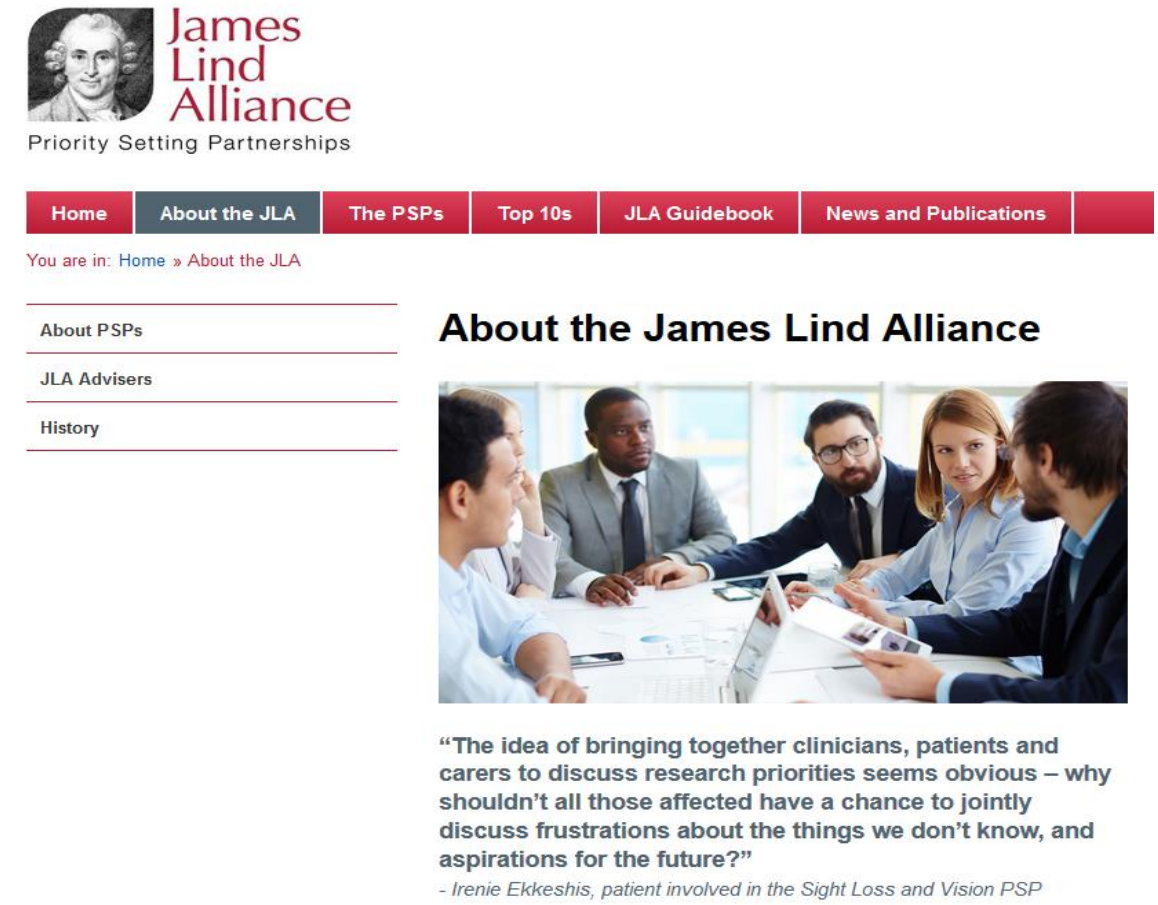
RRI requires …

1. that research projects resolve societal challenges

- Relevant challenges shall be identified with respective stateholders

"When all societal actors work together, they do so in the manner of co-design: A societal challenge is viewed as a design problem, and design problems require for their solution that scientific research is performed in a collaborative manner by those and for those who are confronted by it. All this implies not only a novel conception of "science" – instead of setting its own agenda and solving its own problems, it conrtributes to a larger process of respondimg to global and societal challenges (Nordmann 2017)."

Example: Collaborative Setting of Research Agenda



Valorisation panel

… example of a method to pursue value creation

- … discusses relevance, aims, applications, social aspects …

Valorisation panel

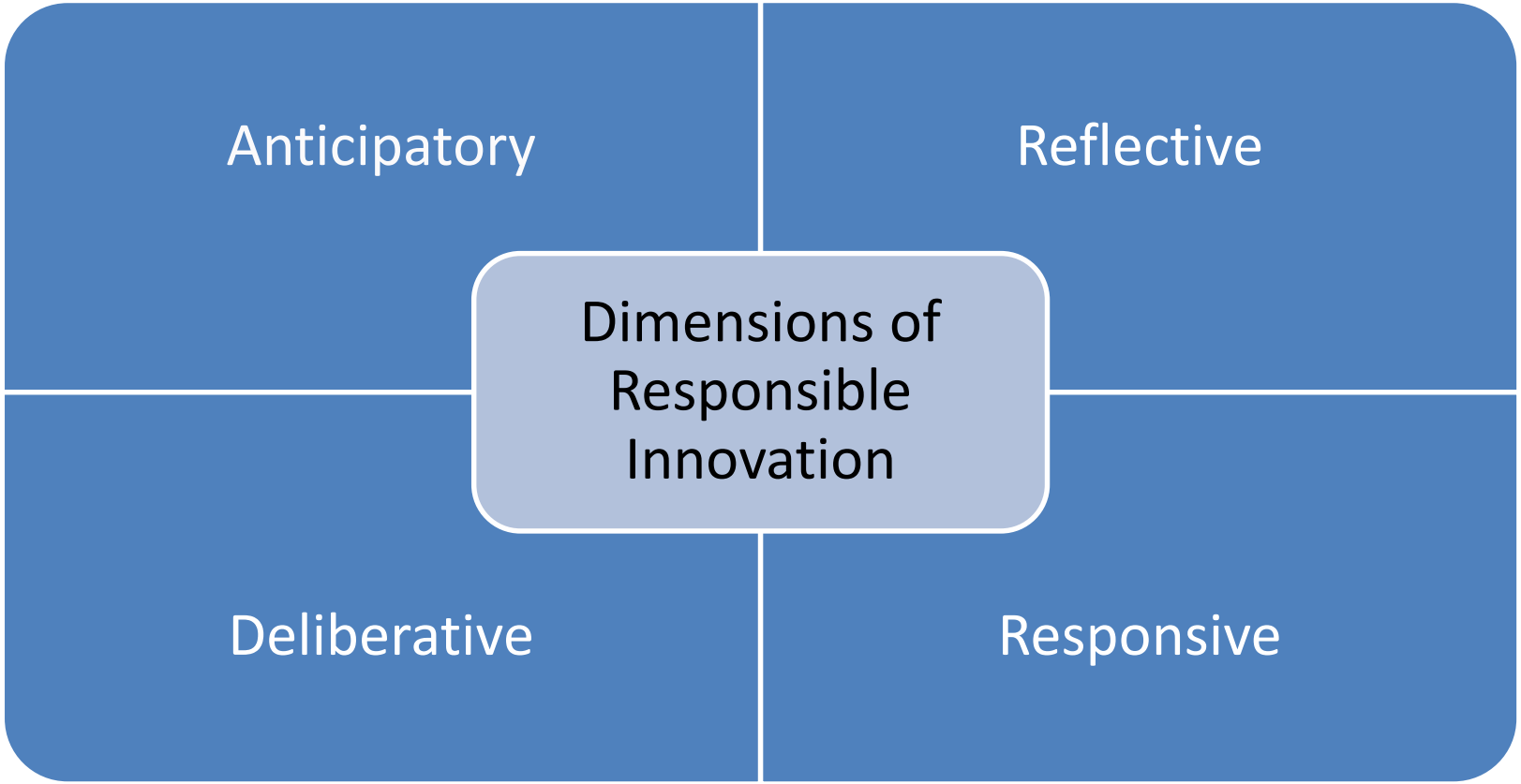
- Leiden Alzheimer Research Nederland (LeARN)
- Centre for Translational Molecular Medicine (CTMM)
- Alzheimer Nederland
- Ministerie van VWS
- Nederlandse Vereniging van Neurologen
- Geheugenpoli UMC & VU
- CBO/Kwaliteitsinstituut voor de gezondheidszorg
- Huisartsenpraktijk
- NHG School voor Geriatrie
- Philips Research
- Schering Plough

RRI requires …

2. research shall be conducted in a responsible manner

The RRI approach invites researchers and developers to advance a sustainable economy and innovation system that is characterized by a economically, politically, and ethically sound way of trading in materials, processes, and products (Nordmann 2017).

RRI-framework



Anticipation

Questions:

What if …?

What is known …?

How plausible is …?

What is possible …?

Techniques:

- Scenario workshops
- Vision exercises
- Technology assessment
- Dialogue meetings
- …

Deliberate/Engage/Include

Questions:

Who is and might be concerned?

Is the process transparent?

Which publics/ stakeholders should be included/made?

…

Techniques:

- Public engagement methods from citizen juries, over focus groups, to dialogue meetings or art installations …

Reflect

Questions:

How do I know what I know?

Who takes responsibility if something goes wrong?

How do my decisions influence technology and society?

…

Techniques:

- Interdisciplinary collaborations/trainings
- Laypeople in expert bodies
- Integrated researcher from social sciences and humanities
- Ethic review boards
- Moratorium
- Code of conducts

Adapt/Respond

Questions:

How to respond to uncertainties/new knowledge/new views …?

What conclusions from the reflection process?

Techniques:

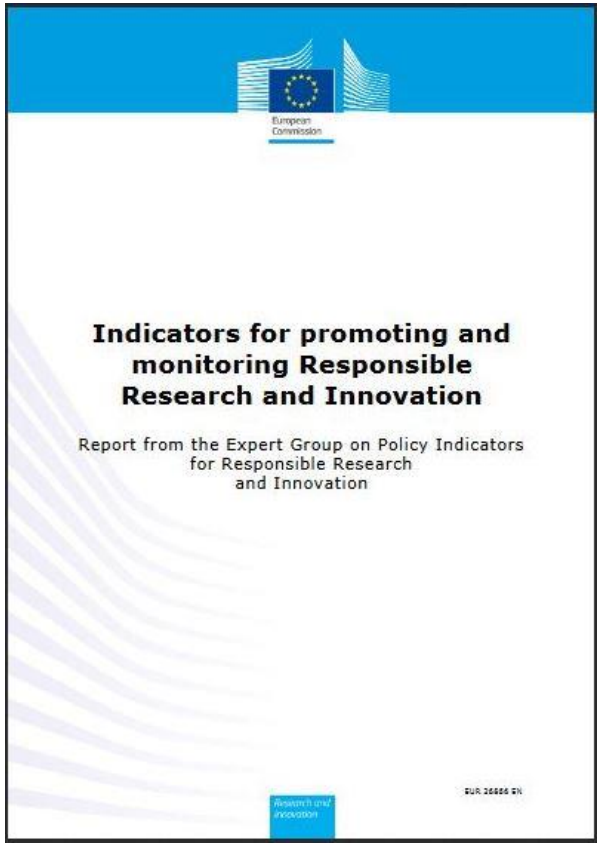
- Certification systems
- Cradle to crade
- Social learning institutions
- ???

RRI in practice

Keys of RRI:

1. Governance
2. Ethics
3. Gender balance
4. Open access
5. Science education
6. Public engagement

7. Sustainability
8. Social equality



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Discussion

- Background «learned lessons», «doing it right the first time» → are ELSA and RRI good strategies to turn things to the better? Can this work?

- Is it actually possible to govern in an anticipatory way?

- Can scientists be hold accountable and does it make sense to demand from them to conduct their research according to RRI (anticipate, reflect, engage, and adapt)?