



Responsible innovation and nanotechnologies (in practice)

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Tuesday, April 5th

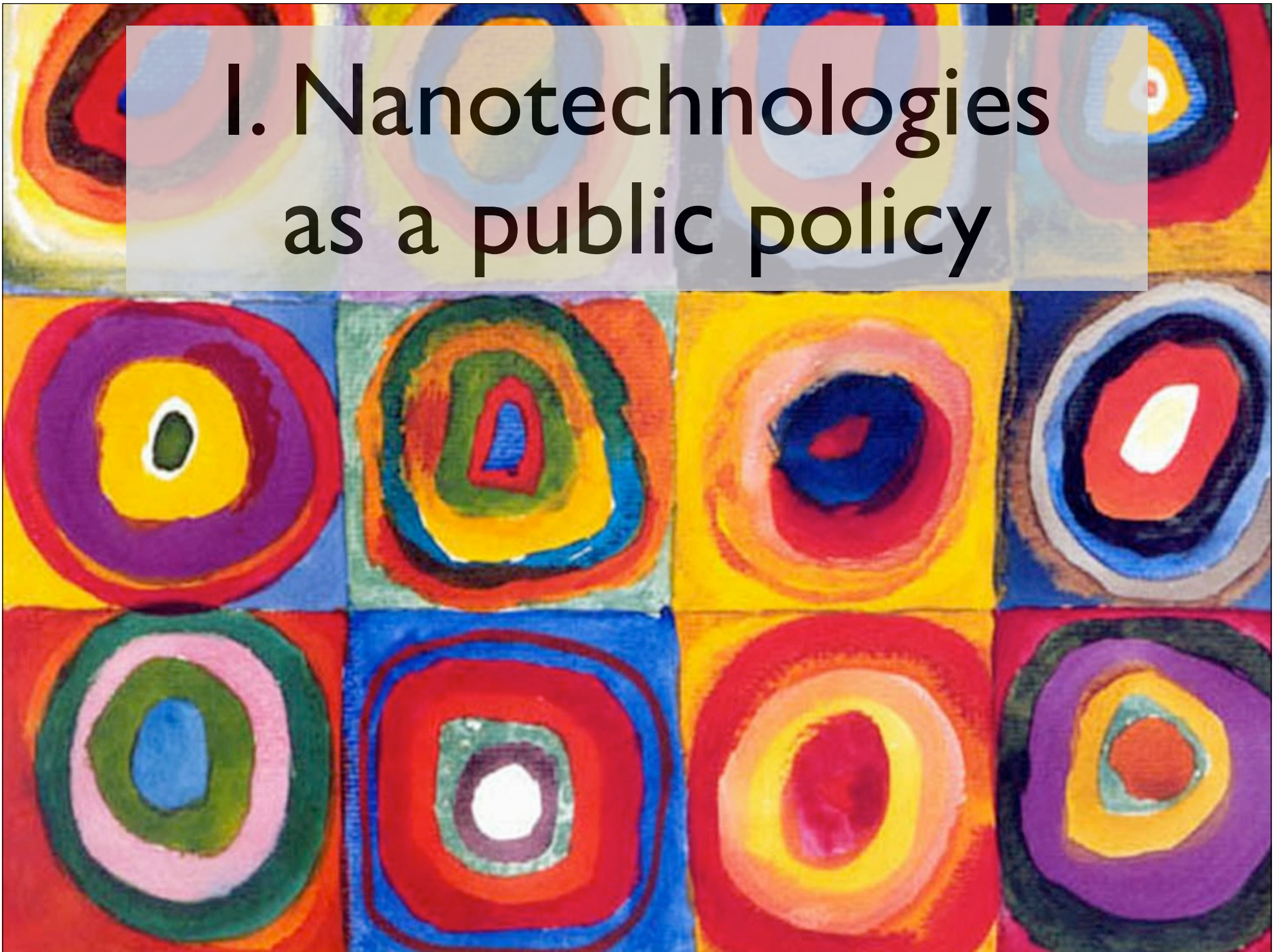
Université Libre de Bruxelles - Nanotechnologies: toward a shift in the scale of ethics?

<http://thoreau.be>

Layout

- Background information
- Nanotechnologies as a public policy
- A mandate for Responsible Innovation and Integration
- Case study into R&D practices: preliminary results and ambiguities

I. Nanotechnologies as a public policy



Heterogeneity

textile

agriculture (novel foods)

electronics

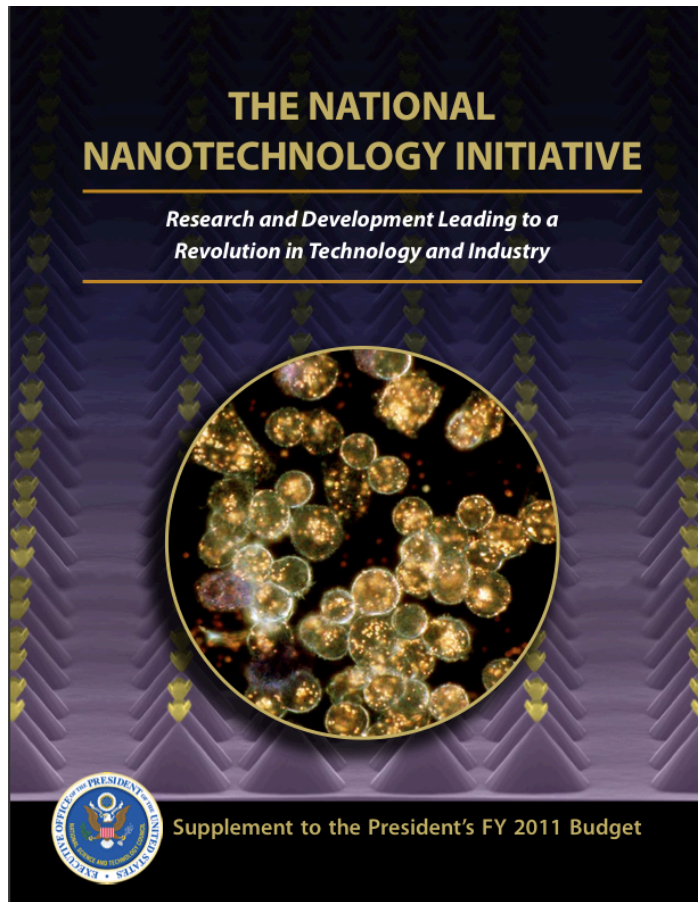
- Heterogeneity of applications
- Could potentially spread to every industrial sector

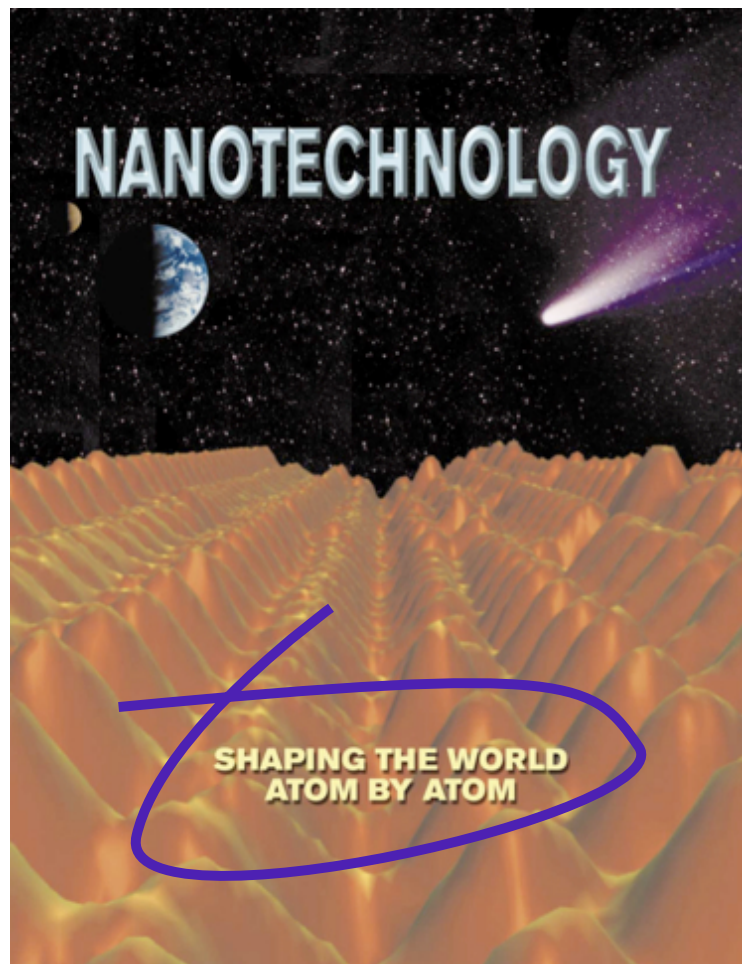
health care

Energy production and
storage

cosmetics

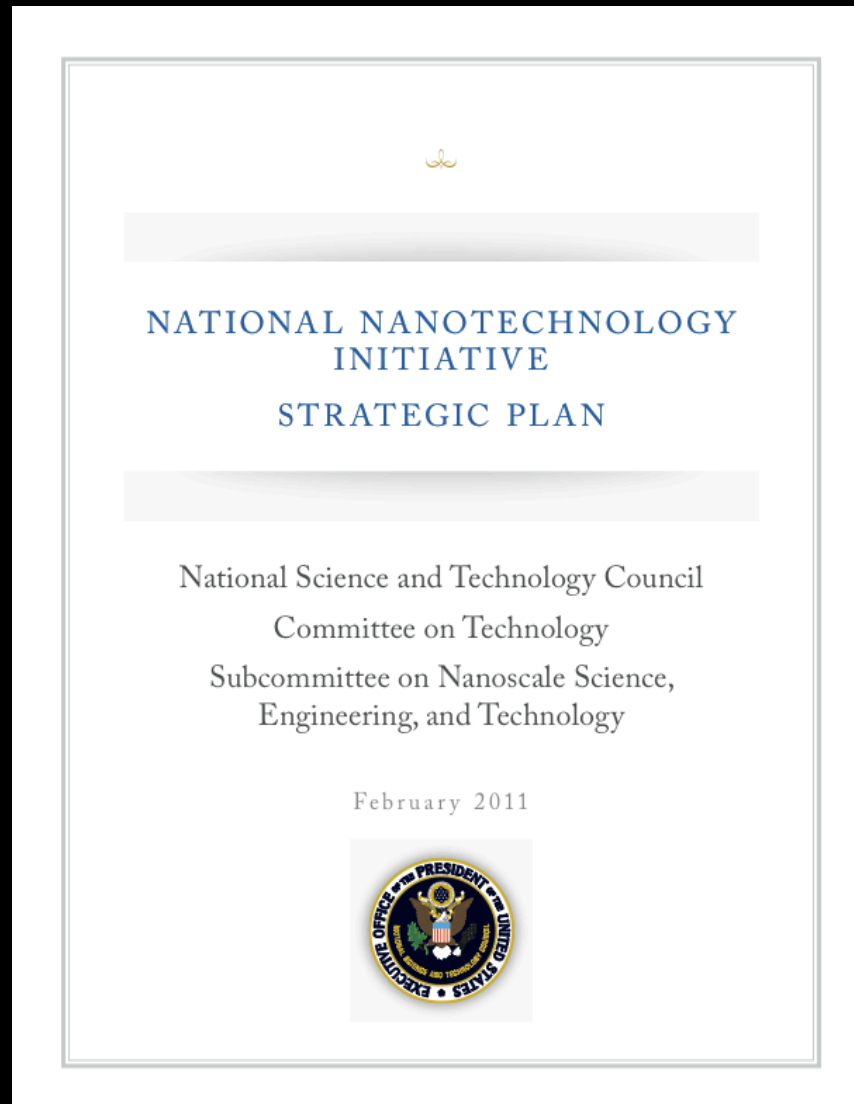
But a political project first and foremost





**National Science and Technology Council
Committee on Technology
The Interagency Working Group on Nanoscience, Engineering and Technology
September 1999, Washington, D.C.**

In 2011...



Funding

USA
A decade of funding
14 billions \$

2011
1,8 billions \$

EU
approx. 1,3 billions €
+ MS = approx. 3 billions €

A societal project

It's about innovation policies



global competition

It's about a knowledge economy



funding race

In the EU

- smart growth
- sustainable growth
- inclusive growth



Regimes of regulation

- Overall calls for 'governance'
(as opposed to hard, top-down and/or command-and-control approaches)
- **F. Ost** = *a flexible and evolutionary management of an undefined set of data looking for some kind of balance*
- Impressionist picture
 - hard law, Technology Assessment (p and P), soft law, public engagement and stakeholders involvement (incl. NGOs), reports, positions ...



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T. Manneke

II. Responsible Innovation and Integration



Responsible innovation?

Nanotechnology must be developed in a safe and responsible manner. Ethical principles must be adhered to and potential health, safety or environmental risks scientifically studied, also in order to prepare for possible regulation. Societal impacts need to be examined and taken into account. Dialogue with the public is essential to focus attention on issues of real concern rather than “science fiction” scenarios.

European Commission, 2004

unprecedentedly open and engaging process. The collective goals and specific objectives articulated in the Strategic Plan will support world-class interdisciplinary nanotechnology research, sustain and expand critical infrastructure, train and inspire the next generation of scientists and engineers, and support responsible development and transfer of nanotechnology into commercial applications to benefit the Nation’s economy and the American people.

A classical typology

HES (Health, Environment and Safety)

+/-
5-6%

+ ELSA (Ethical, Legal and Social aspects)

+/-
1-2%

= « societal » dimensions of nanotechnologies

Soft Law?



EUROPEAN
COMMISSION

European

ETHICS REVIEW

When applying for funding under the Seventh Framework Programme (FP7), researchers must identify ethical issues inherent in their research and explain how these will be addressed. Project proposals that touch on sensitive issues are subjected to a stringent process known as the Ethics Review. In 2009, the Governance and Ethics Unit of the Science, Economy and Society Directorate launched a number of initiatives designed to improve this process and make addressing ethical issues easier for researchers, reviewers and European Commission staff alike.

BROCHURE



Resonance with *Science in Society* Programmes



**SCIENCE IN
SOCIETY
PROGRAMME:
HIGHLIGHTS**

85

SCIENCE IN SOCIETY

- Developed over technological controversies (GMOs, etc.)
- Promote a participatory and inclusive approach
- Funding 2009: 31,8 million €

Code of Conduct (2008)

- ... for **'responsible'** nanoscience and nanotechnologies
- Science in Society programme: 1,2 million €
- process-based (not an end in itself nor a means)
- *'invites all stakeholders to act responsibly'*
- *'is voluntary'*
- *'offers a set of general principles and guidelines'*

A social science agenda

- The 'anticipatory governance' of nanotechnologies
- in line with 'RTTA' and 'CTA' approaches
Guston & Sarewitz, 2002; Schot & Rip, 1997
- Promoted by the *Centre for Nanotechnology in Society* (CNS - ASU and UCSB) - **NNI**
- Foresight, Engagement, Integration
Barben & al., 2008

Integration

- **Integration?**
*Action of integrating: **Combine** one thing with the other so that they become a **whole***
- **Tentative definition** *Transdisciplinary collaboration that aims to integrate the societal dimensions of new and emerging technologies within R&D processes (“into ongoing sociotechnical processes to shape their eventual outcomes”)*
- **Theory** *Trading zones and Interactional Expertise
Galison 1997; Collins & Evans 2002; Gorman, al. 2004*
- **A specificity of nanotechnologies in this sense of « integrative knowledge »**
see different public mandates (Royal Society, NNI, ...)

III. R. I. in practice

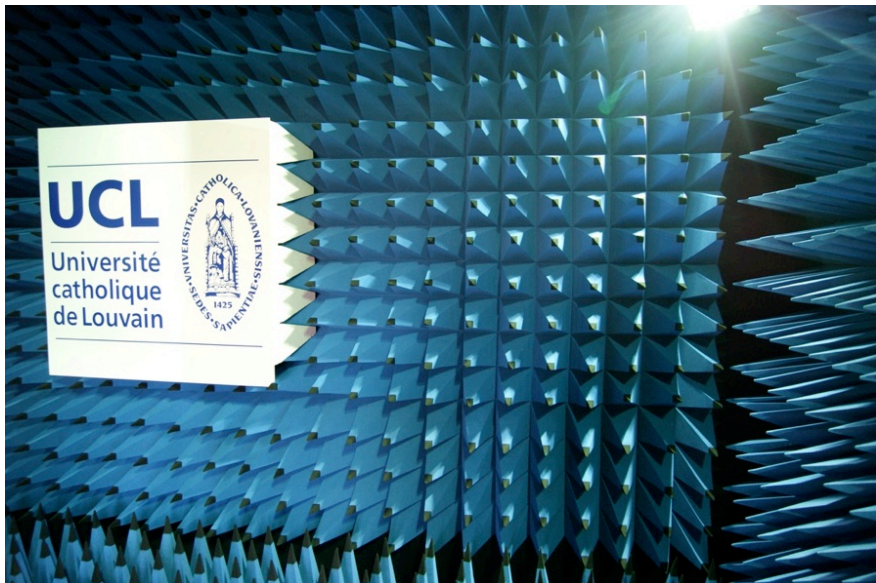


How to make integration work?





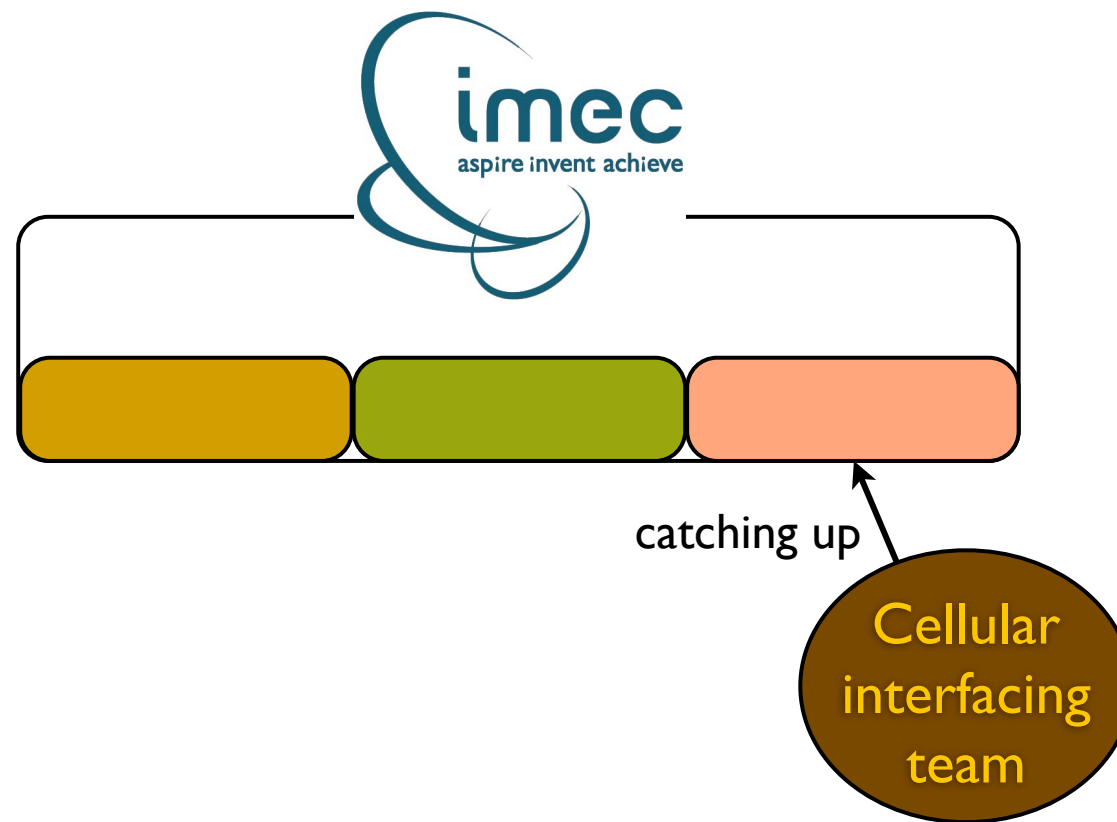
- Why to talk about STIR?
contingency and testify
- **Midstream modulation**
- A decision protocol
- Observe, reflect, document
de facto, reflexive and deliberate modulations (Fisher & al., 2006)
- Start from actual technical practices



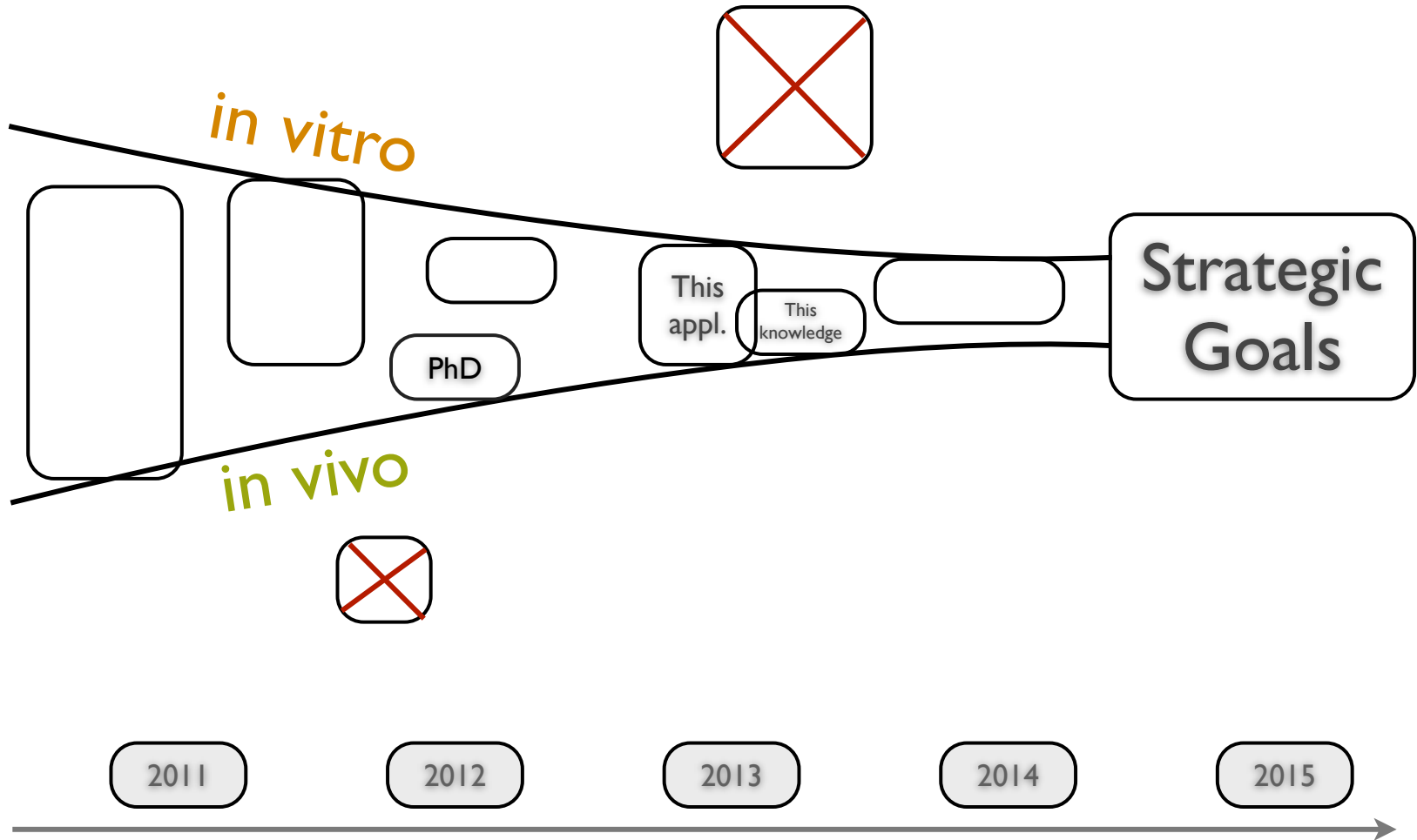
On the lab floor

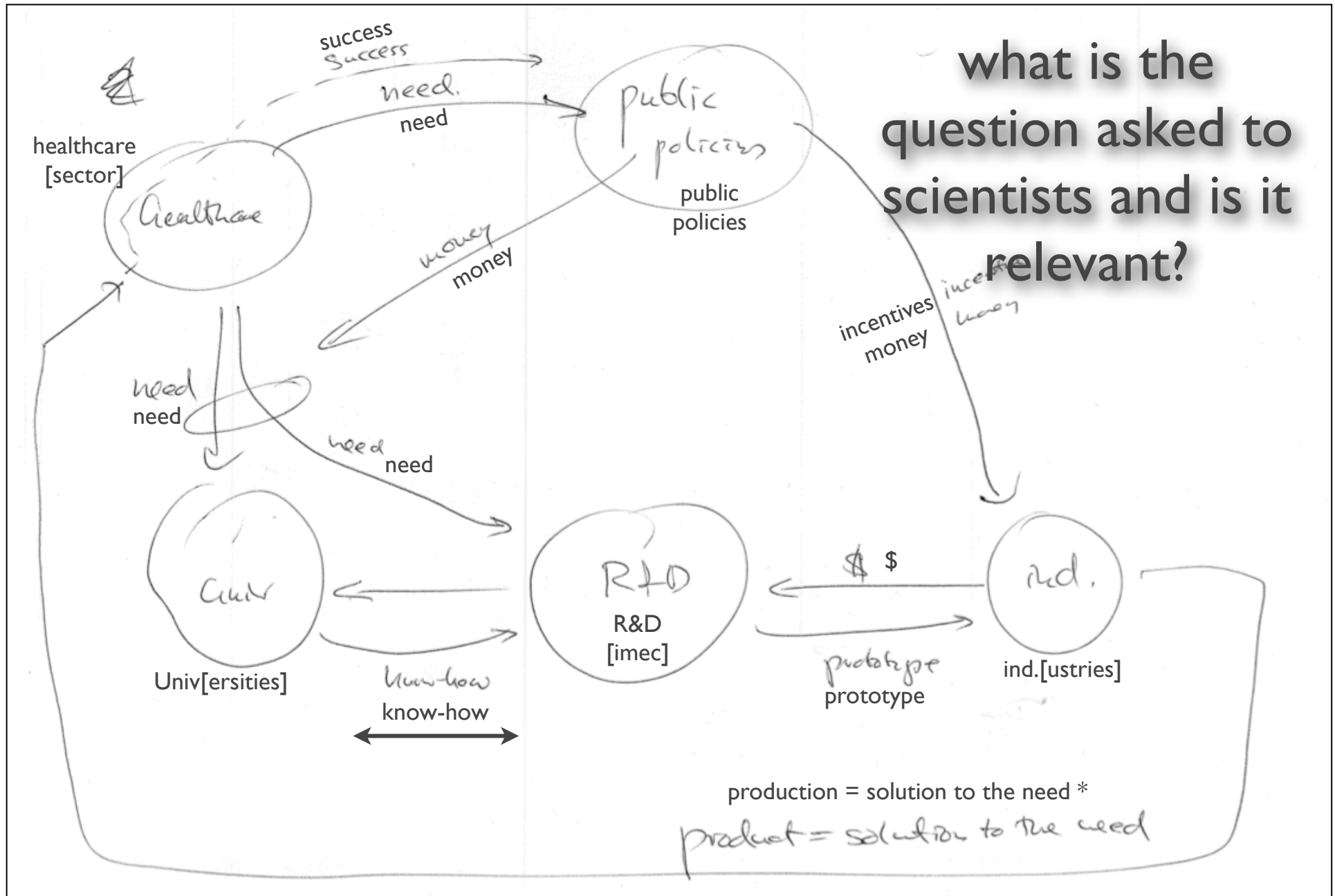
- **Ethically / Socially relevant discussions**
- *Epistemological* (the use of DoE)
- *Cultural* (the DIY culture vs. strongly hierarchized chains of responsibilities)
- *Therapeutical* (feelings of desperation)
- *Strategic* (complete a PhD)
- *Ethics of research* (use of laboratory animals)
- *Prevasiveness of laboratories and competition* (neuron model)

Right above the lab floor



Roadmap





* meet the needs = the very basic aim of R&D firms like imec, according to Wolfgang

The logo of the University of Louvain (UCL), featuring the letters 'UCL' in a bold, blue, sans-serif font.

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A reflexive stance

- Internal and external critique of the ‘research *dispositif*’

with V. Despret, not. *Penser comme un rat*, 2009

- How could you be more reflexive?
- Strong normative push: scientists are being reflexive if we ask them to and if it’s what we look for
- Invert the question: in which conditions is / may a scientist be reflexive?

Tentative results

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- *But most of the people in this department are convinced environmentalists!*

... to working on cellar cells

- *Society desires better laptops and long-lasting batteries. Isn't that why you bought that computer?*
- *Reflexivity of practitioners vs. an established expertise, a new division of moral labour*
For practitioners: Individual responsibility, internalisation of an ethical constraint, externalisation (and reification) of societal reflection, eventually role of legitimation or caution

Conclusion

- Nanotechnologies are political from scratch
- Public policies aim at governing them
- Nanotechnologies have a twofold specificity in public policies
- Strong dynamics for establishing an expertise on the social (publicly supported)
- What about « responsible **innovation** » ?
Slogan? Tautology? Oxymoron? ...The issue of (un)definition