RESPONSIBLE NANOTECH BREAKFAST

RESPONSIBLE RESEARCH AND INNOVATION APPLIED IN THE NANOTECHNOLOGY SECTOR

European Business Network
Brussels, Belgium, 1 March 2017
8:30 – 10:00

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 710543

RESPONSIBLE INNOVATION COMPASS

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- 8:30-8:40 > Welcome! European Business Innovation Centre Network *(EBN)*
- 8:40-9:00 > Round of introduction & Quick Stakeholders Mapping – *Strategic Design Scenarios (SDS)*
- 9:00-9:10 > Short talk from Roger De Keersmaecker on Responsible Research & Innovation in Nanoelectronics and ICT
- 9:10-9:20 > RRI for SMEs: a gateway to new business opportunities - Chiara Davalli *(EBN)*
- 9:20-9:25 > They made it! Inspiring testimonial from a company which integrated RRI principles in their activity
- 9:25-9:35 > Presentation of COMPASS project - *Katharina Jarmai (WU)*
- 9:35-09:45 > The RI Nanotech Lab, what's in it for you? – *Strategic Design Scenarios (SDS)*
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WELCOME !

A WARM WELCOME BY THE HOST OF THE EVENT, EBN

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ROUND OF INTRODUCTION

1. Who are you?
2. What does your organization do?
3. What's your link with nanotechnology?
4. Have you ever heard of RRI?

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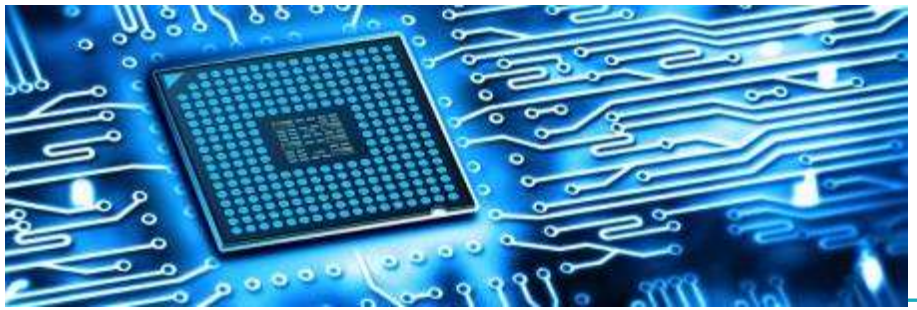
INSPIRATIO-
NAL TALK

RRI IN NANOELECTRONICS AND ICT

By Roger De Keersmaecker (Expert Advisory Board member to the COMPASS project)



Topic

- Nanoelectronics (enabler) + ICT (applications)
- Nanoel. part of NanoT in COMPASS

Outline of the paper

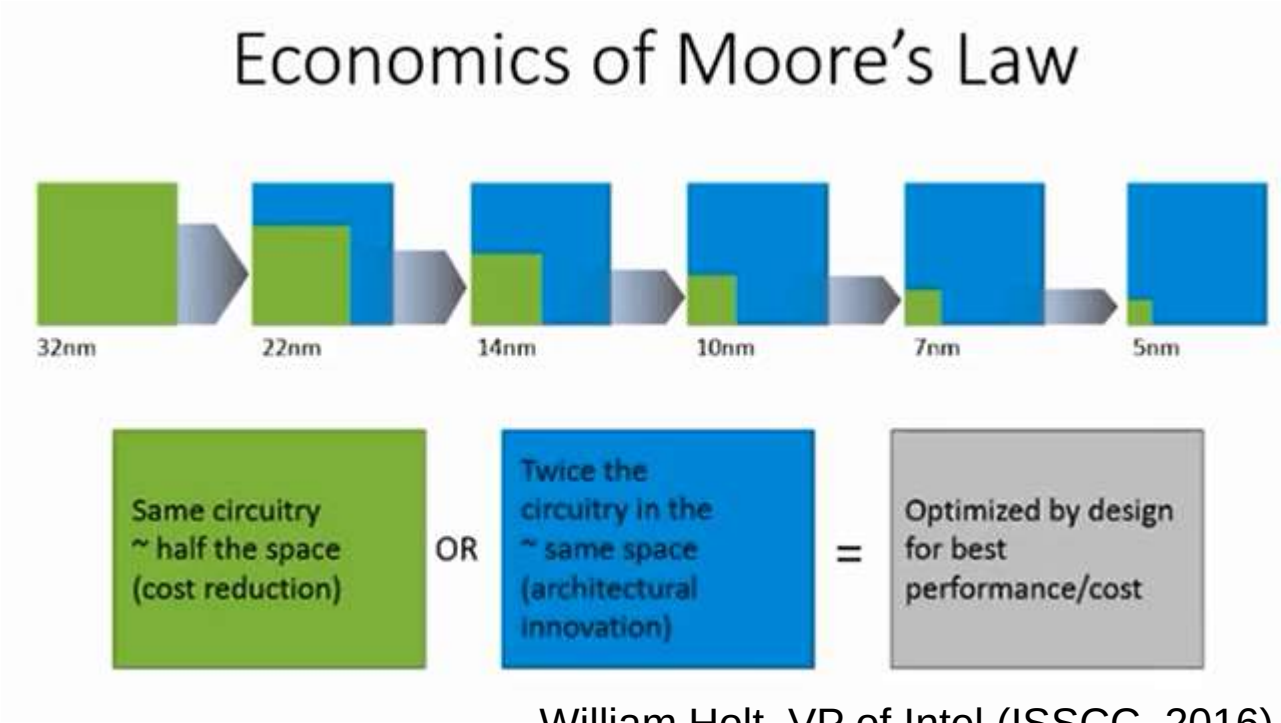
2. Current/emerging topics in Nanoel. and ICT
   - 2.1. Nanoel.
   - 2.2. ICT
   - 2.3. Europe – DSM
   - 2.4. Impact of ICTs
3. RRI
   - 3.1. What is RRI?
   - 3.2. Societal Challenges
   - 3.3. Elements of RRI
   - 3.4. Alternative frameworks
4. Regulations
5. Incentives
6. Collaboration culture
7. Concluding considerations

COMPUTERWORLD

(Jan 27, 2017)
“ Intel pursues Moore's Law with plan to make 7-nm chips this year”

2.1 Nanoelectronics

- Moore’s Law
- 10nm (CES, Jan 2017);
  7nm announced; 5nm coming



William Holt, VP of Intel (ISSCC, 2016)

❑ 2.2 ICT

Model: IDC

2.2 ICT (cont'd)

- 3 underlying trends
  1. immersive technology
  2. "smart" machines
  3. "platform" revolution

- Examples of ICT developments
  - IoT
  - Autonomous vehicles
  - Blockchain
  - AI
  - 5G mobile network

2.3 Europe: Digital Single Market

- Increased productivity, “digitized” industry
- Strong digital industry
- H2020 pillars = ERC + LEIT + Soc. Challenges
- ICT present in all 3 pillars!

ICT Innovation for manufacturing SMEs

2.4 Impact of ICT

- Hyperconnectivity
- emerging capabilities, new services:
  - ubiquitous digital connectivity
  - data and ‘deep’ analytics
- Global “risk” survey
  - AI and robotics seen as threats
  - “risks solvable” vs “risks to things we values”

2.4 Impact of ICT (cont'd)

1. **Companies**
   - distance annihilated
   - threats at strategic level
2. **Society**
   - control diminished
   - impact on work
   - civic space expanded
   - "superpowers"
3. **Individuals**
   - growing digital presence
   - "hybridization"
   - "data society"
   - privacy and autonomy
4. **General**
   - Need to navigate between extremes
   - Dematerialization; abundance?

"On the Internet, nobody knows you're a dog."

©The New Yorker Collection 1993 Peter Steiner
From cartoonbank.com. All rights reserved.

Peter Steiner, The New Yorker (1993)

3. RRI issues

3.1 Origin of RRI?

- EC policy narrative from “science and society” to “science in society” to “science with and for society” (SWAFS)
- RRI = *“Expression of ongoing process of aligning R&I with values, needs and expectations of society”*
- Link R and I?

3.2 Societal Challenges (SC)

- One of the ‘pillars’ in H2020
- 7 priority areas:
  - health; agro-food; energy; transport; climate; inclusive & innovative society; secure society

3.3 Constituting elements of RRI

EC policy agenda with 6 ‘keys’ to RRI:

- Public engagement
- Ethics
- Gender
- Education
- Open access
- Governance (overarching ‘key’)

3.4 Alternative frameworks

- anticipation; reflexivity; inclusion; responsiveness
- 2x2 matrix: ‘outcome’ vs ‘process’; ‘internal’ vs ‘external’
- process dimensions (RRI-Tools)
- All framework suffer from:
  - certain fuzziness; limited workability; proneness to conflict
- Creating Shared Value

4. Regulations

- IOSH (S&H in HE research environment)
- Code-of-Conduct for nanosci. and nanotech research
- “nanomaterials”
  - size not only factor
  - free vs embedded
- ISO/TS for S&H of eng’d nanomaterials
- Bulk chemical substances:
  - REACH
  - SVHCs
  - Not for RTOs,
    but “value chain” important
  - Innovation versus safety

5. Incentives

- The market
- Huge R&D budgets
- Authorities stimulate R&D
- Various forms
  - direct grants; tax benefits; reduced soc. sec.; training etc.
- ELG “10/100/20” strategy
  - € 10B in public-private R&D
  - € 100 B (private) investments
  - from 10 to 20% market share
- IPCEI
- PENTA
  - combined nat’l funding

6. Collaboration culture

- Int'l Technology Roadmap for Semiconductors
- Europe:
  - framework programmes
  - PPPs 'de facto' addressing SCs
  - associations (AENEAS, ARTEMIS-IA, EPoSS)
  - JTIs in ICT: ENIAC; ECSEL
  - also: Big Data PPP; Future Internet PPP; 5G-PPP etc.
- ELG: full value chain
- AENEAS SRA:
  - addresses SCs
  - "human factor"
  - calls for SSH accompaniment

7. Concluding reflections

- SCs “noble” but *not* mission-oriented
  - open-ended, ambiguous:
  - R&I system needs modification
  - *“Where are the politics?”*
- “Shared Value Creation”
  - collective-impact initiatives
  - social enterprise, ...
- “Horizontalisation”
  - diffusion of power
  - connected stakeholders; new models?
- SCs linked with Education
  - SCs solution from sci. & eng’g
  - link SC - sci. & eng’g - schools

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RRI for SMEs

A GATEWAY TO NEW BUSINESS OPPORTUNITIES

By Chiara Davalli (EBN)

Chiara.Davalli@ebn.eu
@ChiaraDavalli

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Why

WHY? Society is facing many challenges today...

Health, demographic change, and wellbeing

Food, agriculture & forestry, and water

Secure, clean and efficient energy

Smart, green and integrated transport

Climate action, environment, and resources

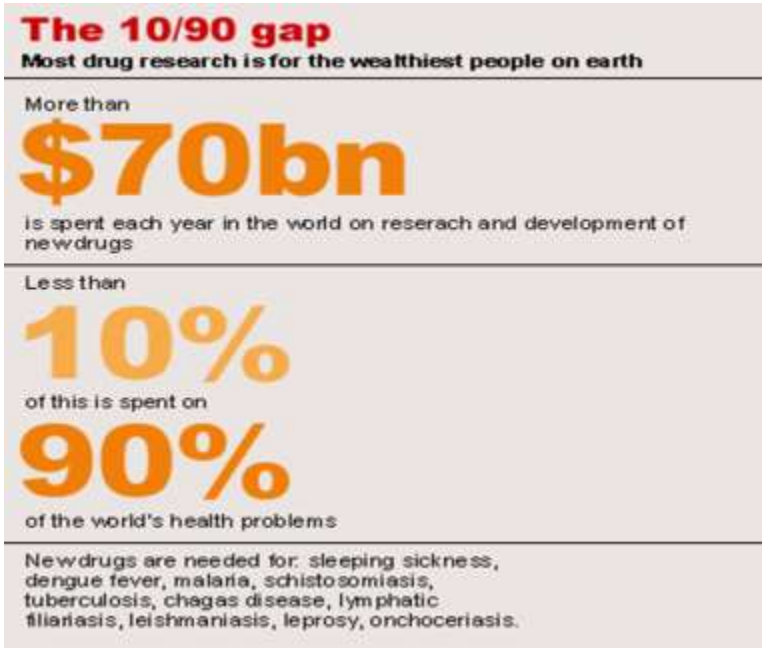
Secure societies: freedom and security of Europe and its citizens

These challenges are complex and uncertain

Why

Most drug research is for the wealthiest people on earth

(The Guardian. Special Report. Aids)



Science and technology could contribute to solving these grand challenges, but many innovations fail..

- have unexpected (negative) consequences
- are controversial
- some needs are not met (e.g. neglected diseases, neglected groups)

Why are we confronted with controversies and failures from the R&I system to fulfil societal expectations?

...mismatch between science and society:

Interests of science & industry ↔ Needs of society

...but also because not all key actors have been engaged:

EC pushed forward the concept of Responsible Research and Innovation (RRI), with the aim of fostering research and innovation in an inclusive and societally-oriented way.

>> RRI is a cross-cutting issue in Horizon2020

RRI...

...is about including all actors, considering specific key issues and integrating some process dimensions in the R&I practice.

Working together towards ethically acceptable, socially desirable and environmentally sustainable products and services.

In other words

The first goal of RRI is the creation of positive impact:

all the consequences of an activity on both its direct and indirect stakeholders should

-improve individual well-being
-create sustainable living conditions
-strengthening the inclusiveness of society

Why choosing that path in industry?!

To be, or not to be responsible?

Why choosing that path in industry?

To create new opportunities!

Contribute to a better world & be beneficial for the business itself

by adopting an holistic approach which balances financial, social, ethical and environmental considerations

RRI > innovating in an inclusive and societally oriented way opens up new opportunities for SMEs in Europe

Focus on SMEs

Flexible, adaptable, less hierarchical, willing to experiment with potential benefit of emerging technologies for meeting societal challenges

Focus on SMEs

Societal challenges require innovative solutions resulting from a multi stakeholders dialogue >>>

- Broader vision/Long term vision
- Increased and improved relationship with customers and users
- New resources of creativity and innovation
- Increased awareness about upcoming regulatory regimes
- Reconsider business processes focusing on customers rather than competitors
- Obtain competitive advantages and benefits by including RRI in their processes and products (cost reduction, risk reduction, better supply chain engagement, reputation, innovation capabilities, increased attractiveness of the employer, new opportunities)

RRI can help SMEs in their decision making taking into account a long term vision, an inclusive attitude and a societally oriented approach.

COMPASS for SMEs, what's in it for you?

- learn from your peers and experts about the latest developments around Responsible Research & Innovation in your sector and how this applies to your business to:
  - tackle societal challenges
  - get long-term revenue
  - create shared value
- generate new ideas and business opportunities for improvement like roadmaps, guidelines, and tangible case studies
- access to new business networks and influencers across Europe
- increased visibility **through the COMPASS (and partners') website /** social media / newsletter / case studies / webinars etc.
- your input and ideas will help formulate and design an industry wide standard for Responsible Research and Innovation
- learn about new funding streams through national and regional funding programs, impact investment networks and the European Commission

RRI approach is a driver for economic growth in a social, ethical and sustainable way

As Winston Churchill said, "gentlemen, we have run out of money, now we have to think". Now we are not running out of money, we are running out of a clean planet. Therefore, we cannot afford foolishness, it is too expensive. Responsibility requires complex thinking, wide angle analysis and forecasting of consequences.

BioGas+ by AppNPs

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THEY MADE IT!

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INSPIRING TESTIMONIAL FROM A COMPANY WHICH INTEGRATED RRI PRINCIPLES IN THEIR ACTIVITY:

APPLIED NANOPARTICLES SL

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THE COMPASS PROJECT

RESPONSIBLE INNOVATION COMPASS

RESPONSIBLE INNOVATION COMPASS

By Katharina Jarmai

INSTITUTE FOR MANAGING SUSTAINABILITY
VIENNA UNIVERSITY OF BUSINESS AND ECONOMICS

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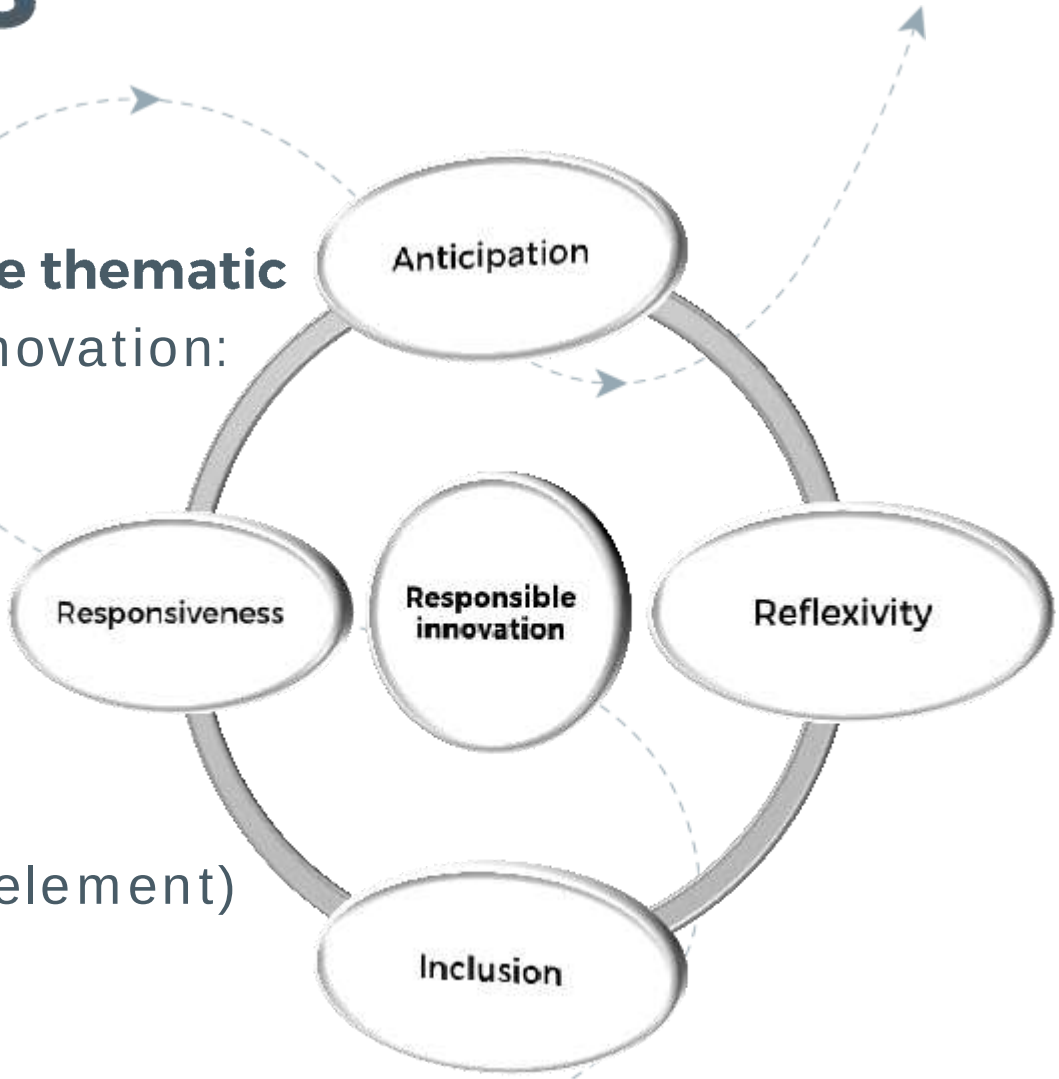
European Commission's five thematic elements of responsible innovation:

- Public engagement
- Ethics
- Gender & diversity
- Science education
- Open access

+ Governance (overarching element)



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Responsible innovation vs. Corporate Social Sustainability (CSR):

- All societal actors (including business) assume responsibility for their actions and effects on society
- Responsible innovation looks specifically at research, development and innovation processes and outcomes (i.e. the core business of high technology industries)

European Commission's interest in responsible business research, development and innovation activities...?

Innovation is key to solving societal challenges
(and increasing European competitiveness)

Solve societal challenges or create new challenges?

Societal support or resistance?

Consumer trust?

Policy support?

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Responsible innovation can be a means to:

- Anticipate and address societal risks;
- Increase awareness about (emerging) societal trends;
- Improve responsiveness to needs of society.
- Develop new ideas;
- Improve existing products, processes and services;
- Lower the risk of future business failure...

- ...and play your part in solving societal challenges!

How can businesses do responsible innovation?

RESPONSIBLE INNOVATION COMPASS

Institute for Managing Sustainability WU

uclan University of Central Lancashire — CYPRUS —

"la Caixa" Foundation

DE MONTFORT UNIVERSITY LEICESTER

ebn innovation network

B Lab Europe

SDS strategicdesign scenarios.net

Expert advisory board

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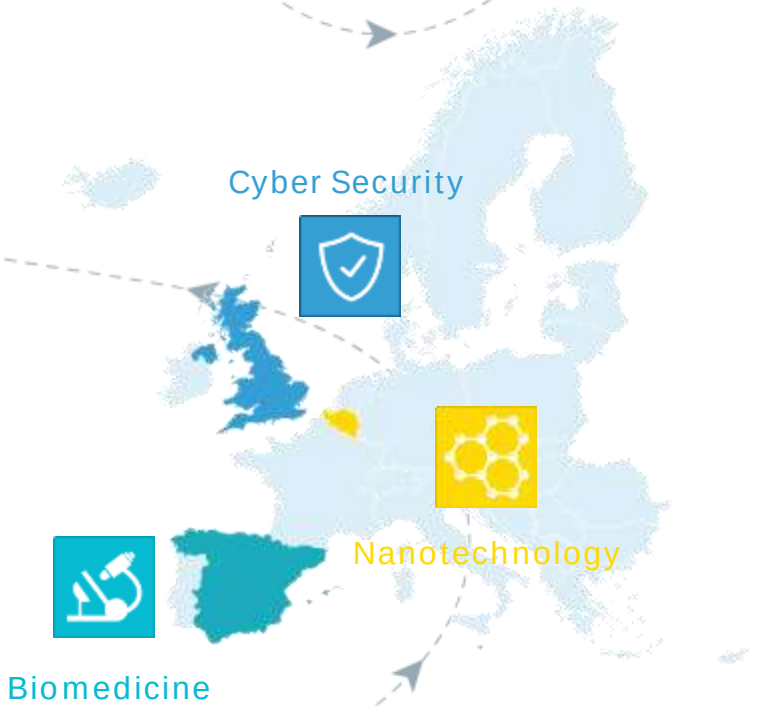
- Case studies, interviews, actors and initiatives in Europe
- Visions and roadmaps for responsible innovation – by and for businesses (2017)
- Put responsible innovation into practice → Pilot testing of visions and roadmaps by businesses (2018)



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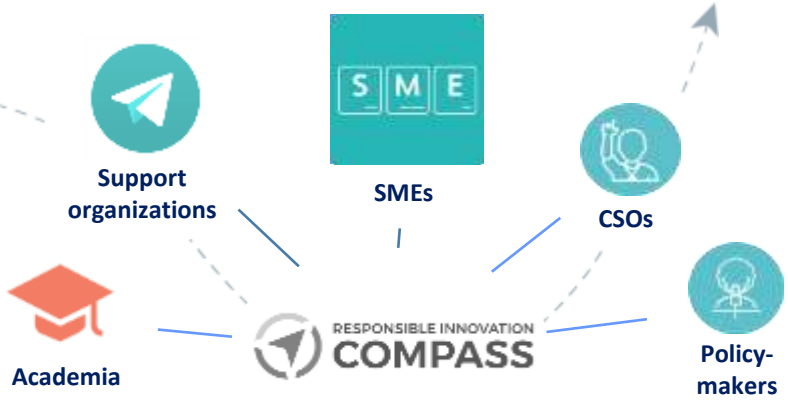

- Self-check tool to identify strengths and weaknesses re. responsible innovation (2018)
- Teaching and training materials (2018)
- **“One stop shop” online portal**
  www.innovation-compass.eu

The methodology of the Responsible innovation labs

By François Jégou (SDS)

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RI-LABS' CHOREOGRAPHY

1 PEER-TO-PEER WEBINAR

Are your research and innovation processes responsible?

2 FOREWARD - LOOKING WORKSHOP

What do you know about the future of your sector? Take part to a quick foresight exercise

#3 VISION EXPLORATION WEBINAR

All what you imagine in term of a responsible innovation and **more...**

4 BACKCASTING ROADMAPS WORKSHOP

Don't leave goodwill for tomorrow: build your own action plan for Responsible Innovation

5 TESTING WEBINAR

It's time to harvest what we have built together
Goal: test the roadmap tool

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1 - PEER-TO-PEER WEBINAR…

Are your research and innovation processes responsible?

Goal: **share your company views with peers and researchers**

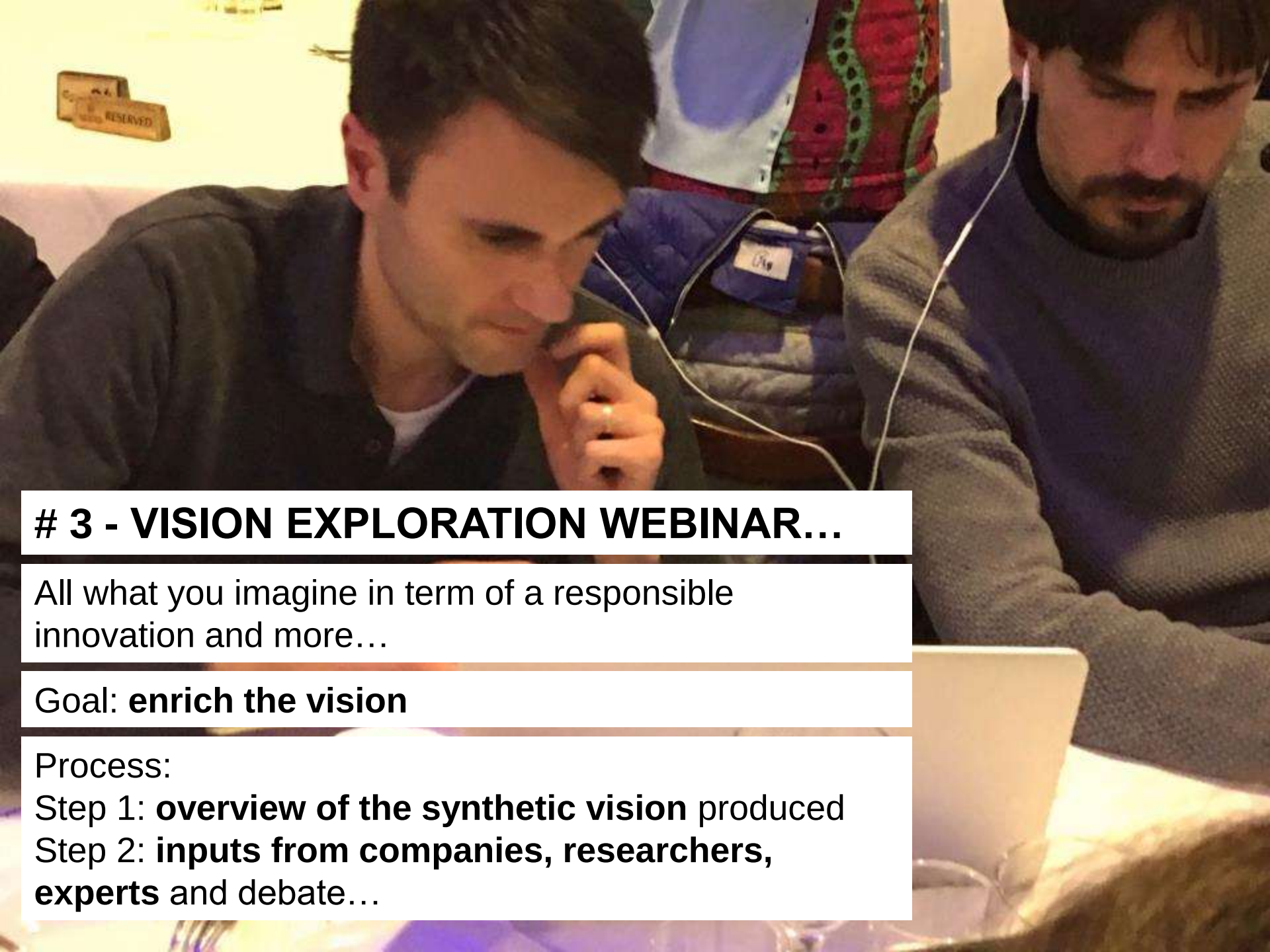
Process:
Step 1: **research, innovation and responsibility questions**
Step 2: **inputs from company, researcher/expert** and debate…

2 - FOREWARD-LOOKING WORKSHOP…

What do you know about the future of your sector? Take part to **a quick foresight exercise**

Goal: build together with your peer **a vision of the key challenges of your sector** in terms of Responsible Innovation…

Process:
Step 1: **Set the scene** of the future
Step 2: Define **responsible innovation challenges**



3 - VISION EXPLORATION WEBINAR…

All what you imagine in term of a responsible innovation and more…

Goal: **enrich the vision**

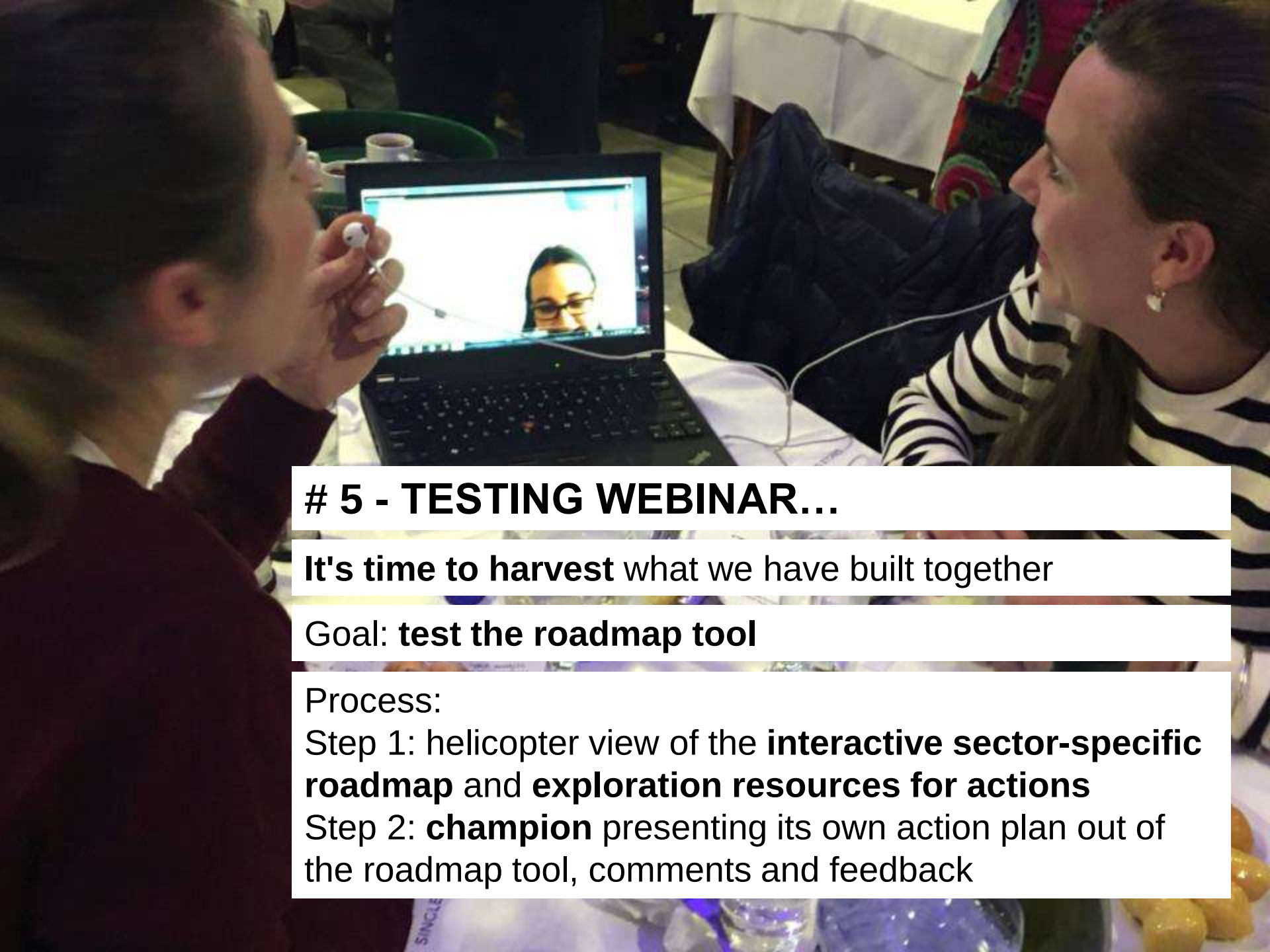
Process:
Step 1: **overview of the synthetic vision** produced
Step 2: **inputs from companies, researchers, experts** and debate…

4 - BACKCASTING ROADMAPS WORKSHOP…

Don't leave goodwill for tomorrow: **build your own action plan** for Responsible Innovation

Goal: define **actions and milestone** to reach the vision

Process:
Step 1: build **your company roadmap**
Step 2: **benchmark** with your peers



5 - TESTING WEBINAR…

It's time to harvest what we have built together

Goal: **test the roadmap tool**

Process:
Step 1: helicopter view of the **interactive sector-specific roadmap** and **exploration resources for actions**
Step 2: **champion** presenting its own action plan out of the roadmap tool, comments and feedback

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Questions and answers

THANK YOU!

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