Konferenzraum, 11:30-12:45

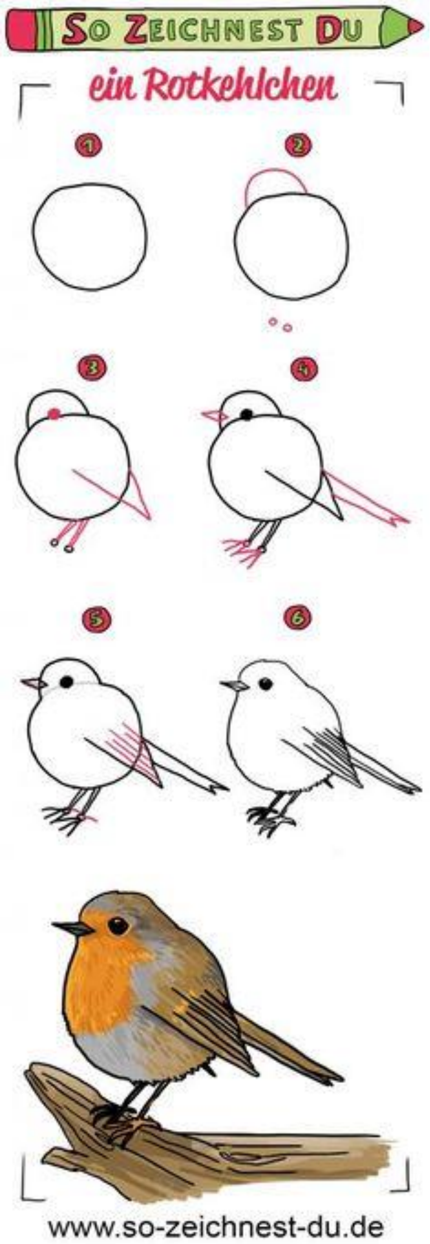
Stakeholder and co-creation

Gesche Krause (Chair)
Lidia Borrell Damián
Henning Kroll

Stakeholder and co-creation

Gesche Krause (Chair)

Senior research fellow, Alfred Wegener Institute (AWI)
& Institute for Advanced Sustainability Studies (IASS), Germany



Stakeholder co-creation

Methods and conditions for effective co-creation

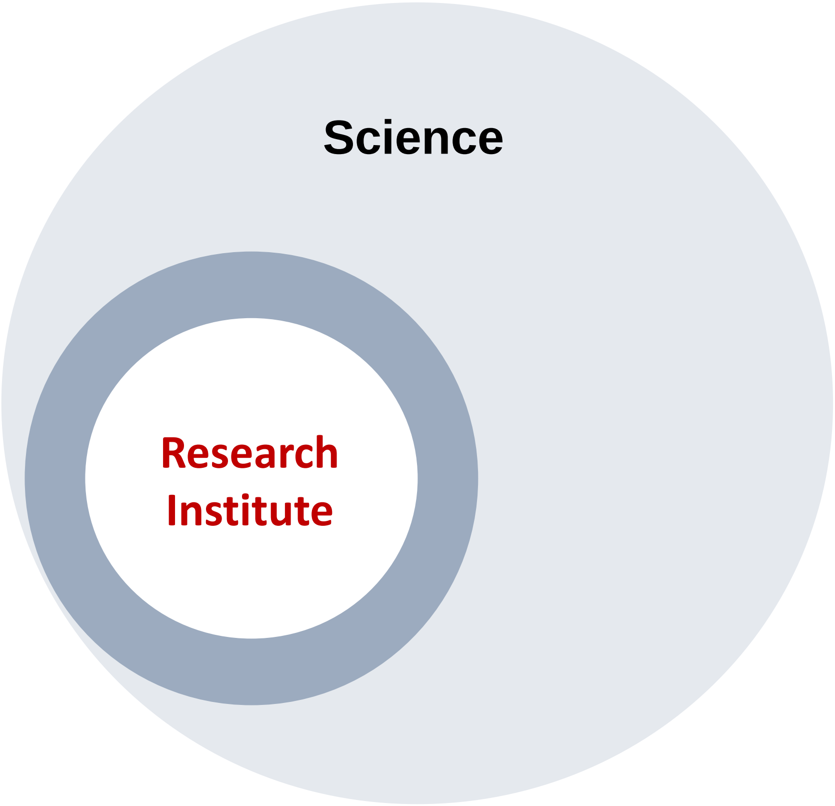
Dr. Gesche Krause

Institute for Advanced Sustainability Studies (IASS), Potsdam, Germany

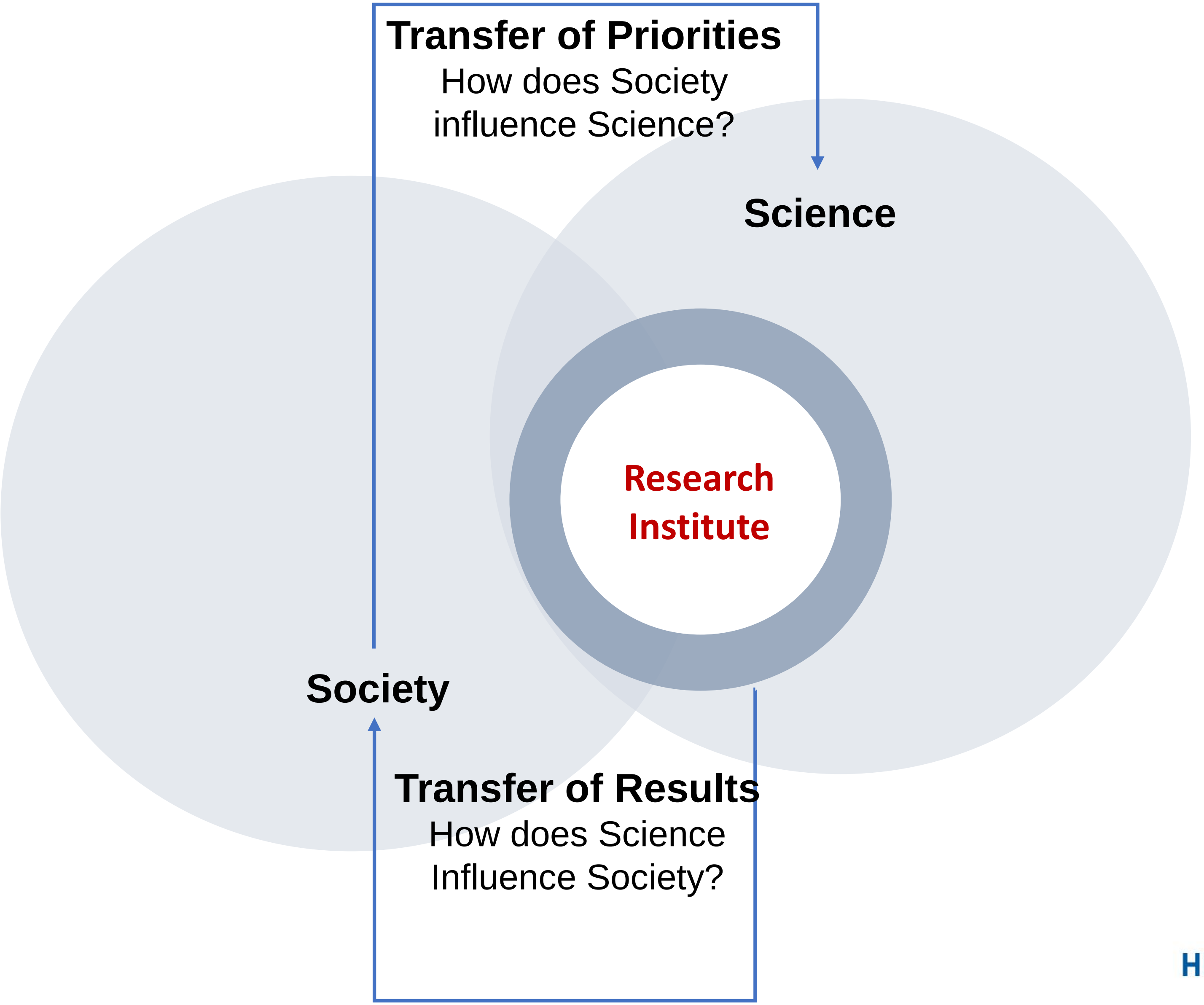
Alfred Wegener Institute Helmholtz Center for Polar and Marine Research (AWI), Bremerhaven, Germany

HELMHOLTZ RESEARCH FOR GRAND CHALLENGES

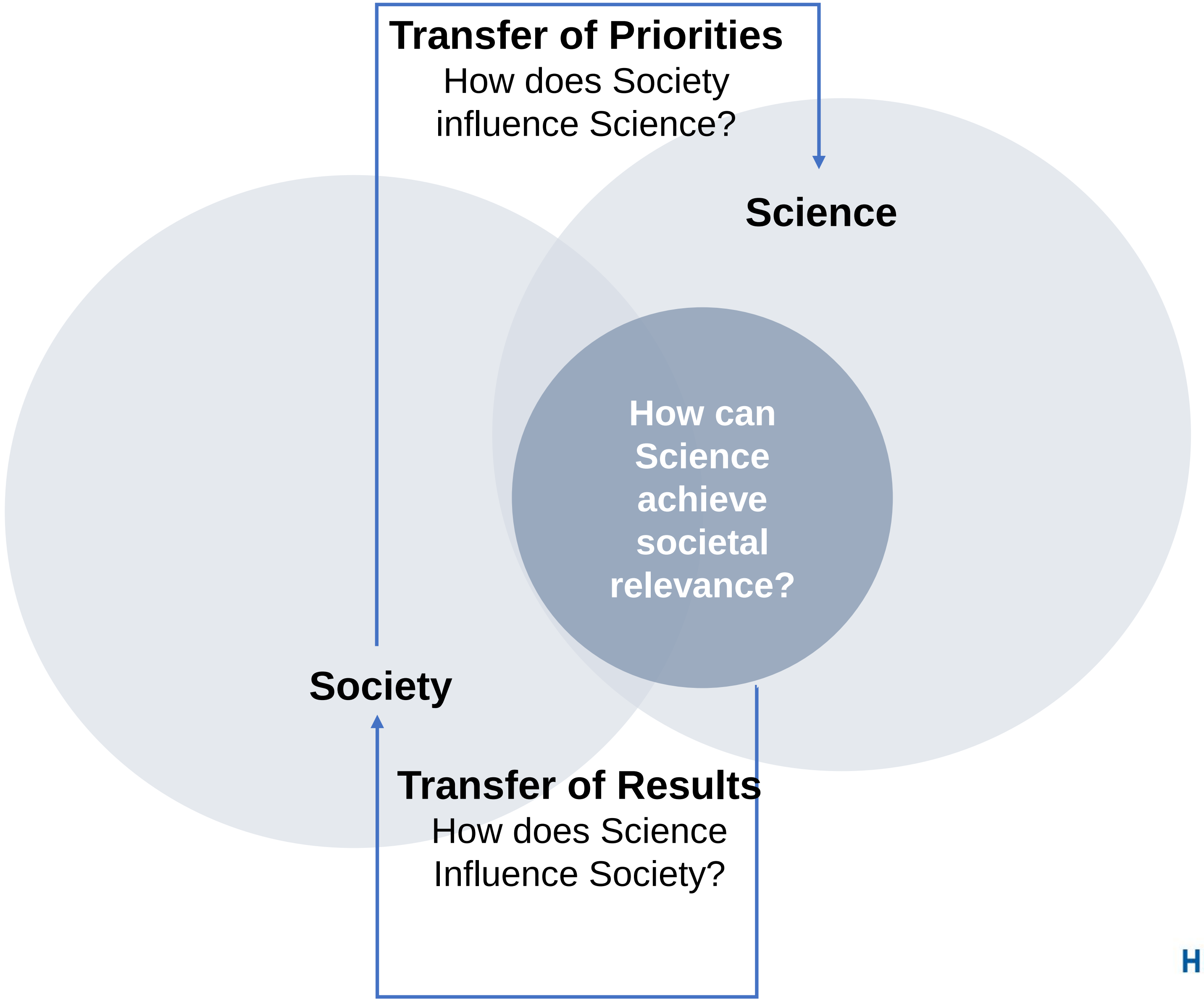
Co-creation at the Science-Society Nexus



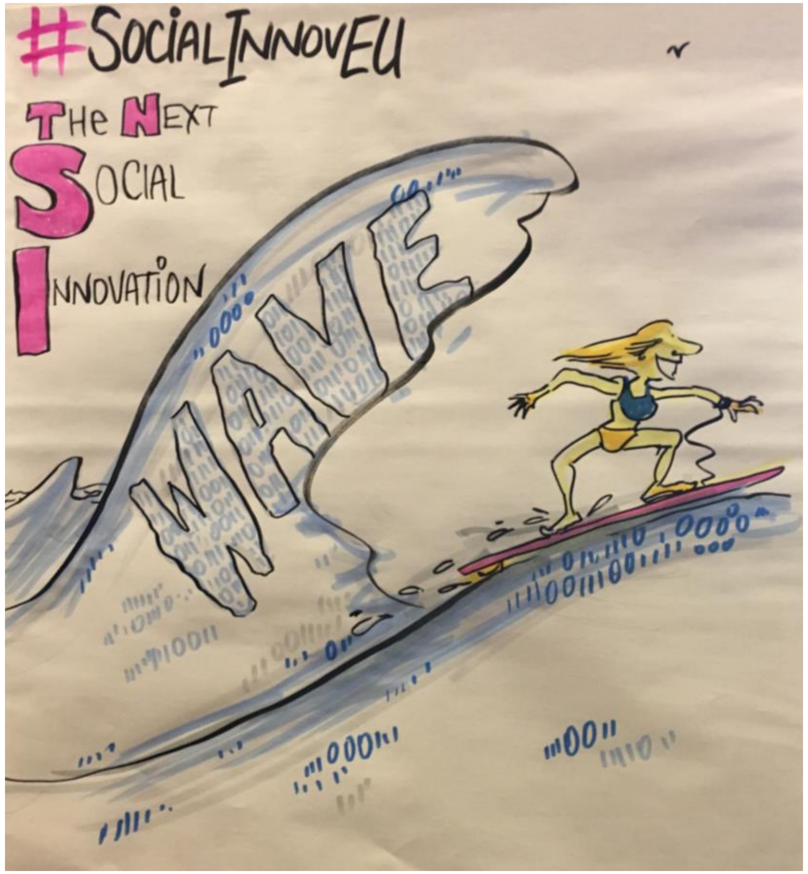
Co-creation at the Science-Society Nexus



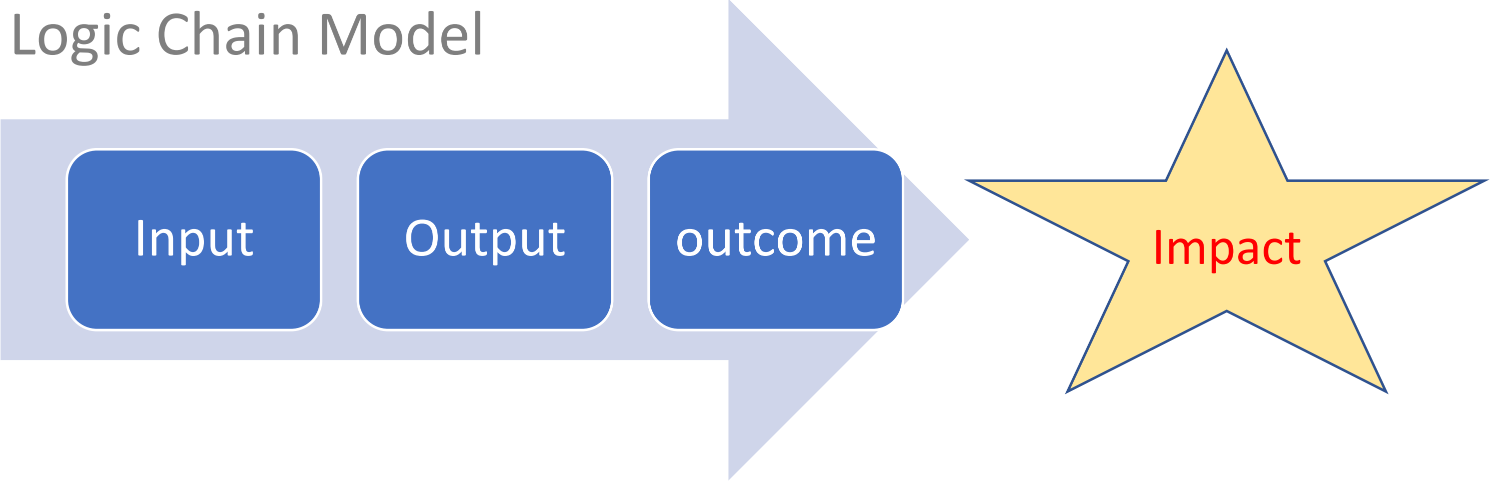
Co-creation at the Science-Society Nexus



Imposed Determism of Co-Creation



Logic Chain Model



How to capture and acknowledge the plurality of knowledge forms in stakeholder co-creation?

For whom?
By whom?
By which means?
To what effect?
….

Capturing co-creation at the science-policy nexus

AWI

INTERNAS
Germany

Preperation of global assessments for the national policy arena

Central Questions:

- How is Germany responding to findings and directives emerging from global science assessments?
- How can Helmholtz expertise and data holdings link to these responses?

HELMHOLTZ ZENTRUM FÜR UMWELTFORSCHUNG UFZ

AWI ALFRED-WEGENER-INSTITUT HELMHOLTZ-ZENTRUM FÜR POLAR- UND MEERESFORSCHUNG

HELMHOLTZ RESEARCH FOR GRAND CHALLENGES

Example: The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) Europe/Central Asia Assessment

Draft Summary for Policymakers (June 2016)

D1. Proactive policies and governance strategies

D2. Integrated approaches that cut across policy sectors

D3. Well-designed mixes of policy instruments

D5. Coordination and cohesiveness

…

German Context

Comparison to activities in the German Sustainability Strategy

Options for Integration, i.e. Marine Conservation, Agriculturea…

Often seperation between different tpyes of instruments

Multi-level problems between Ländern, Bund, EU….

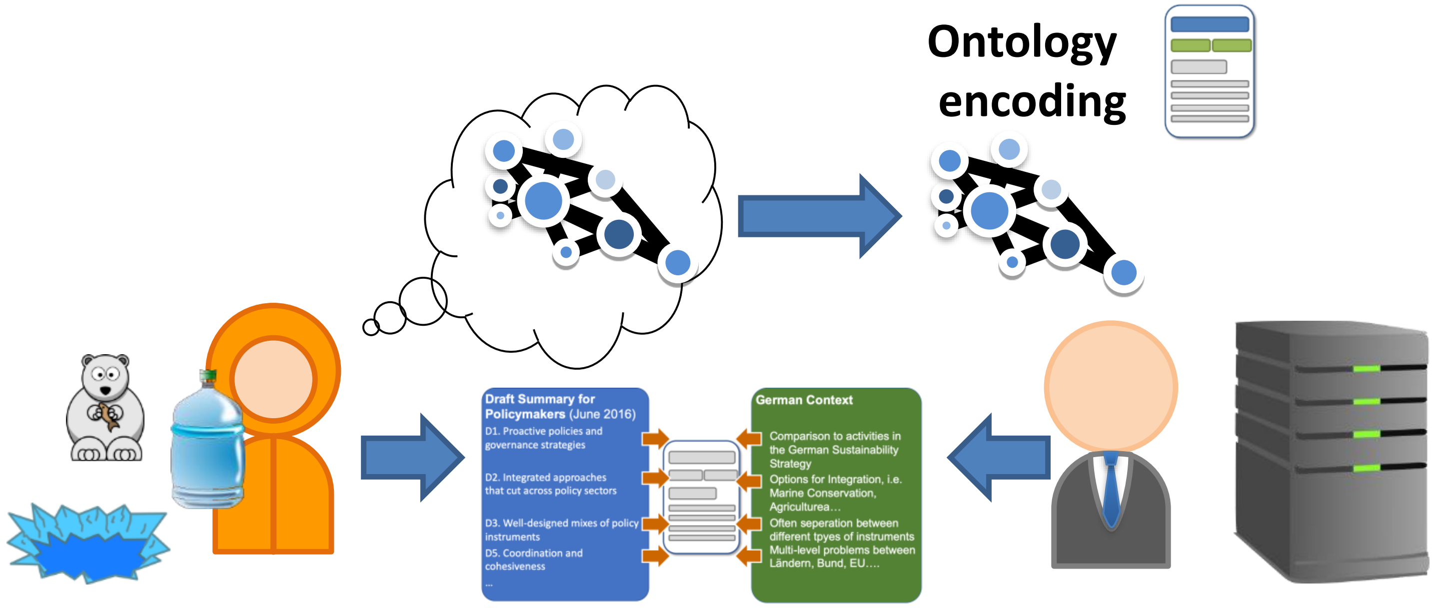
INTERNAS Germany

HELMHOLTZ RESEARCH FOR GRAND CHALLENGES

Once you get the right people in the room…

How can we efficiently capture and transfer knowledge?

Capture, ontologise and represent knowledge in silico with AI and semantic web technologies

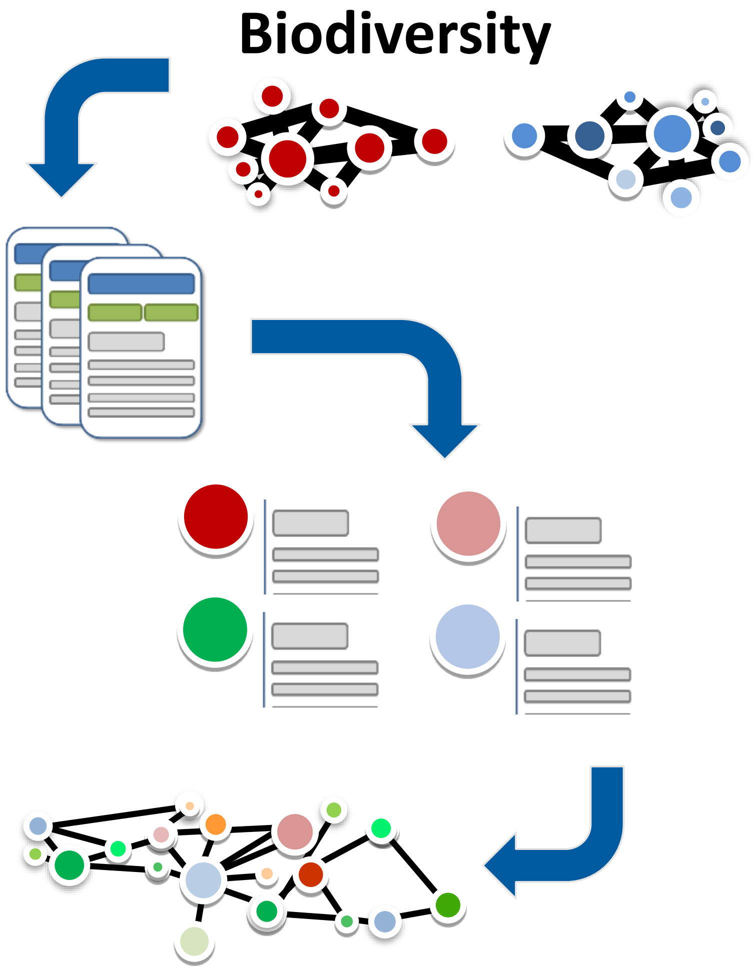


FAIR

I1. (meta)data use a <u>formal, accessible, shared, and broadly applicable language</u> for knowledge representation.

Capturing Process within Stakeholder Co-creation

- Before each event, the ontologies relevant to each international assessment are identified and engaged
- Extensive minutes are taken during each knowledge transfer event, capturing national understandings, ambiguities, and priorities
- Key concepts and national examples are identified and systematically defined using ontological best practices (Aristotelian logic)
- Knowledge explored in sufficient depth is encoded in recognised reference ontologies for machine actionability
    - Insect conservation
    - Marine Spatial Planning



Application of Co-Creation Outcomes

UN environment

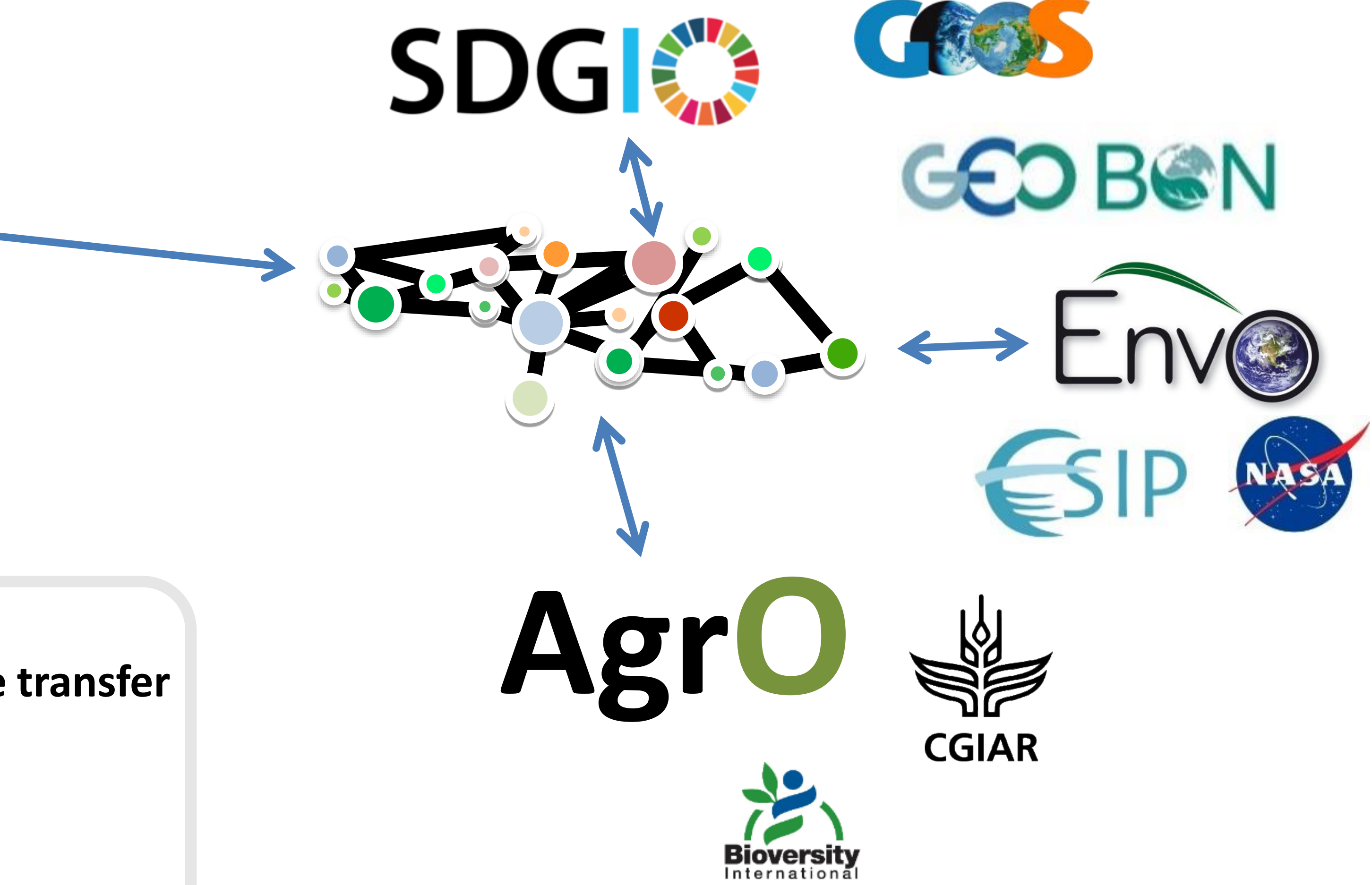
United Nations Educational, Scientific and Cultural Organization
Intergovernmental Oceanographic Commission

AWI

Immediate outcomes:

INTERNAS Germany

- Rapid transfer of knowledge to interoperating systems from a wide range of stakeholders



- **New models for machine-assisted knowledge transfer across stakeholder groups**
- **A bridge between data science research and operational informatics**

UN Decade of Ocean Science for
nt
0

"To gather ocean stakeholders w
ensure ocean science can fully su
Development Goal 14 on the oce

UNITED NATIONS ENVIRONMENT PROGRAMME

Programme des Nations Unies pour l'environnement   Programa de las Naciones Unidas para el Medio Ambiente
Программа Организации Объединенных Наций по окружающей среде   برنامج الأمم المتحدة للبيئة
联合国环境规划署

UNEP

Clarifying terms in the SDGs: representing the meaning behind the terminology

Introduction and purpose of this document

The meanings behind the terms used in the SDGs, their targets, and their indicators are often multifaceted, reflecting the diverse community of stakeholders involved in the SDG process. Consequently, there is a need to represent these various shades of meaning in a coherent way to prevent confusion when handling data and developing policy actions as well as enhancing the discoverability and management of SDG information and data across all the domains of knowledge.

UNEP, in collaboration with experts in the field of ontology, is building a **Sustainable Development Goals Interface Ontology (SDGIO)** so that entities relevant to the SDGs can be logically represented, defined, interrelated, and linked to the corresponding terminology in glossaries and resources such as the UN System Data Catalogue and SDG Innovation platform.

The SDGIO Working Group is now drawing input from domain specialists to shape the SDGIO to help the NSOs ensure that the SDG indicators are fully consistent across the SDGs.

SDGIO

UN environment

Sustainable Development Goals Interface Ontology

Building data systems to support interfaces to the Global Goals, targets, and indicators

United Nations Educational, Scientific and Cultural Organization
Intergovernmental Oceanographic Commission
Sustainable Development Goals

OLTZ RESEARCH FOR GRAND CHALLENGES

Central Method of Evaluating Meaningful Co-Creation

from the stance of a natural science fundamental research institute

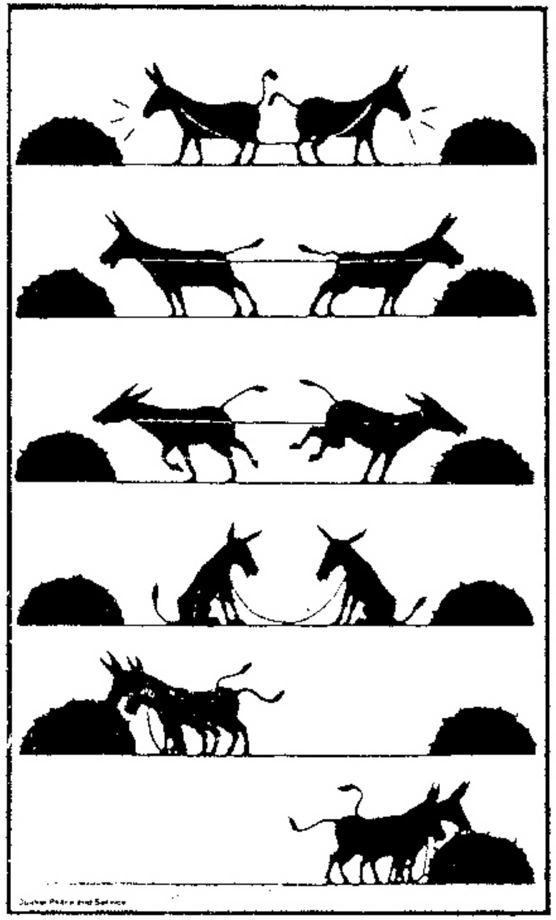
1. Summative Evaluation

   – Validation of the WT activities at the end of the project by e.g. counting peer-reviewed articles and their citation rate

2. Formative Evaluation

   - fosters reflection on ongoing project activities, either participatory by co-creation with stakeholders or internal process evaluations

Outlook

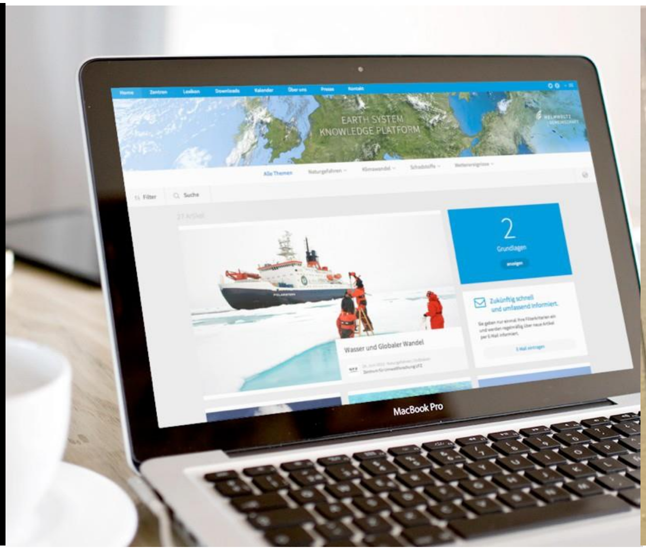


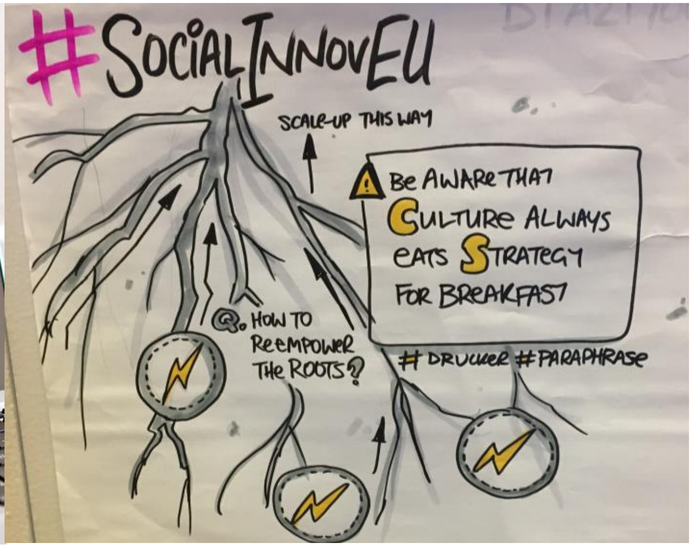
(http://vliegerprojecten.nl/wp-content/uploads/2011/05/samenwerkende-ezels.jpg)

The Donkeys Dilemma

…..when and who regards co-creation as positive?....

Thank you!





https://www.awi.de/forschung/besondere-gruppen/wissensplattform-erde-und-umwelt

https://www.awi.de/internas.html

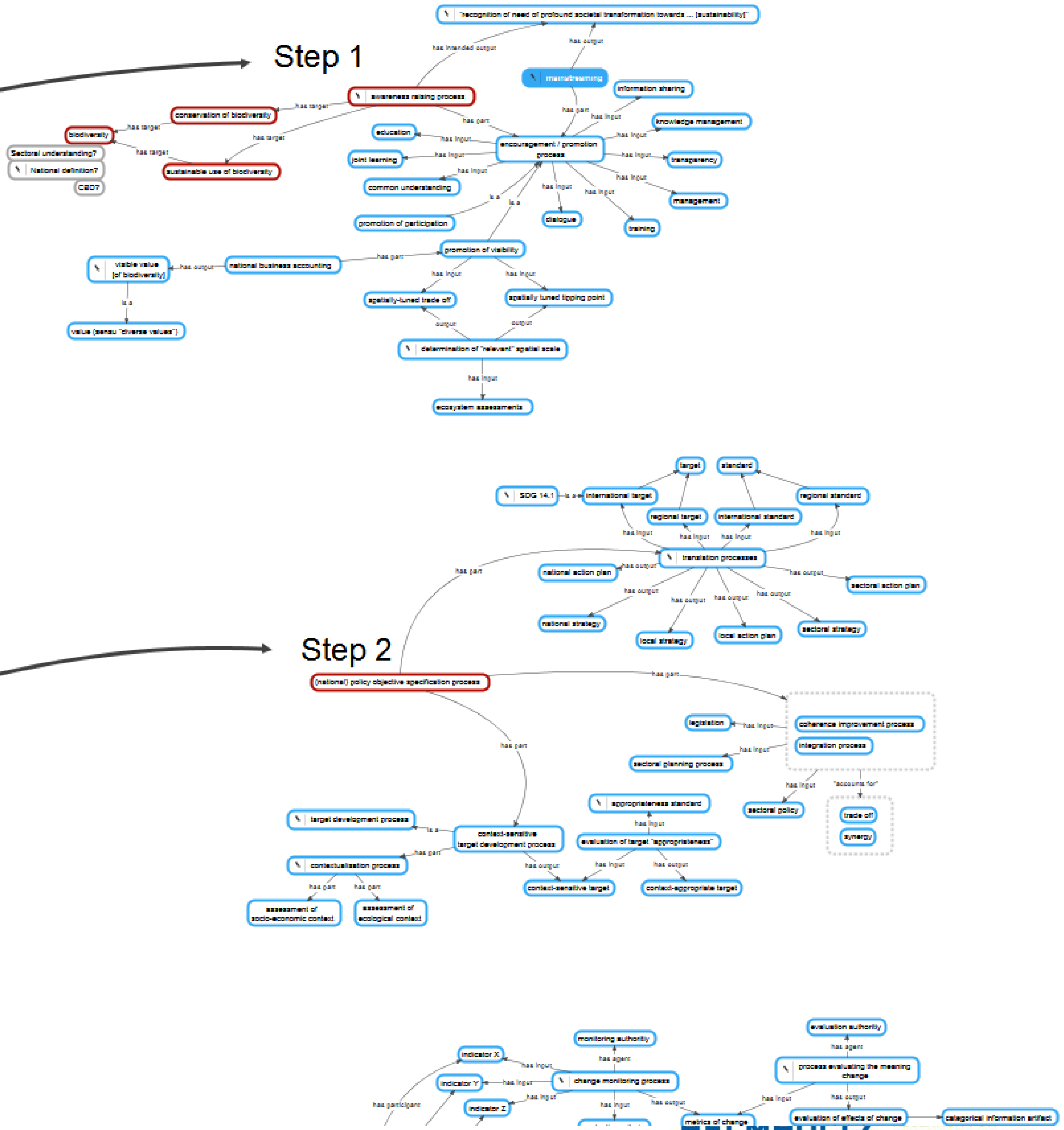
https://www.eskp.de

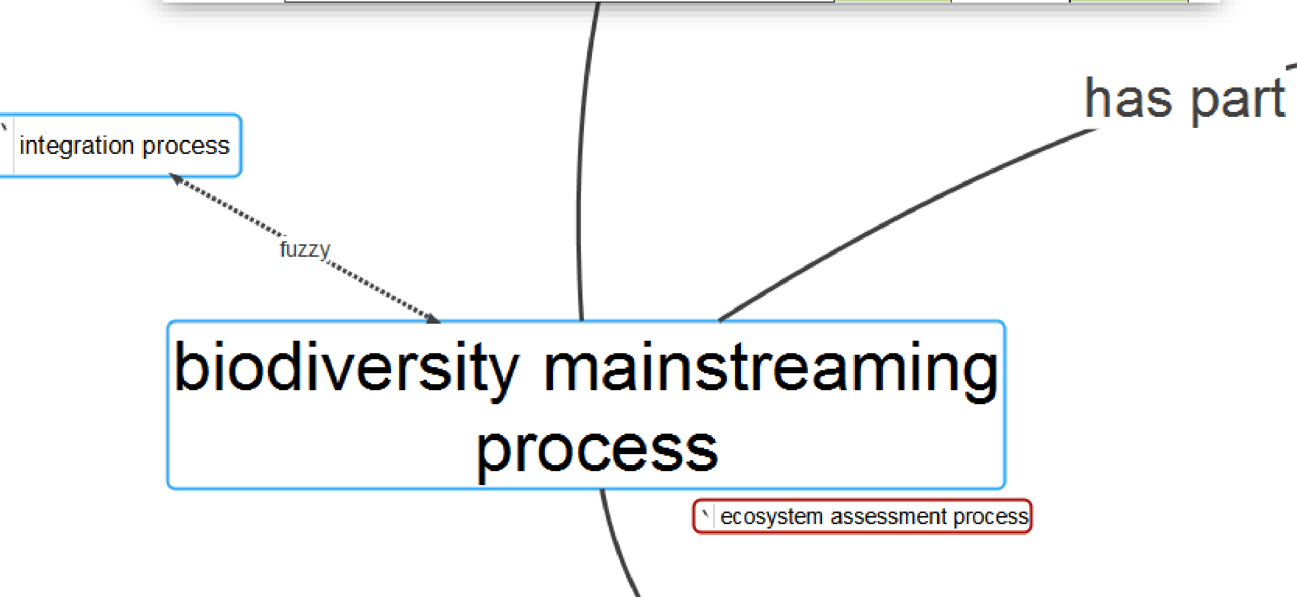
Regionales IPBES Assessment zu Europa und Zentralasien (ECA)

Auszug aus Tabelle SPM.4 - nur für die Region West-Europa für den INTERNAS Workshop, 23 Mai 2018. Weitere Erläuterung (welche, sich auf mehrere Regionen bezieht, ist nach der Tabelle eingefügt), Originaltitel lautet:

Policy options and opportunities for mainstreaming the conservation and sustainable use of biodiversity and the sustained provision of nature's contributions to people in Europe and Central Asia

Sectors		CONSERVATION	ENVIRONMENT[1]	AGRICULTURE
STEPS	OPTIONS AND OPPORTUNITIES Region/country	Western Europe	Western Europe	Western Europe
STEP1: Raising awareness	Encourage education, jount learning and common understanding			
	Promote information sharing, transparency, knowledge managment and training			
	Make trade-offs and tipping points visivle at the relevant spatial scales			
	Encourage participation and dialogue among different actors			
	Make diverse values visible through national business accounting			
	Mainstream recognition of need for profound societal transformation towards			
STEP2: Defining policy objectives	Adopt and translate international and regional targets and standards into national and local strategies and action plans			
	Improve integration and coherence of legislation, sectoral policies and planning processes, to account for trade-offs and synergies			
	Develop context appropriate targets and objectives to stimulate positive change			
	Increase transparency and participation of a wide range of actors including indigenous peoples and local communities in decision making			
STEP3:	***Legal and regulatory instruments***			
Designing	Define and ensure property and access rights and responsibility			





Stakeholder and co-creation

Lydia Borrell Damián
Director for Research and Innovation,
European University Association, Belgium

Methods and Conditions for effective co-creation: the role of university leadership

2019 AESIS Conference „Impact of Science“

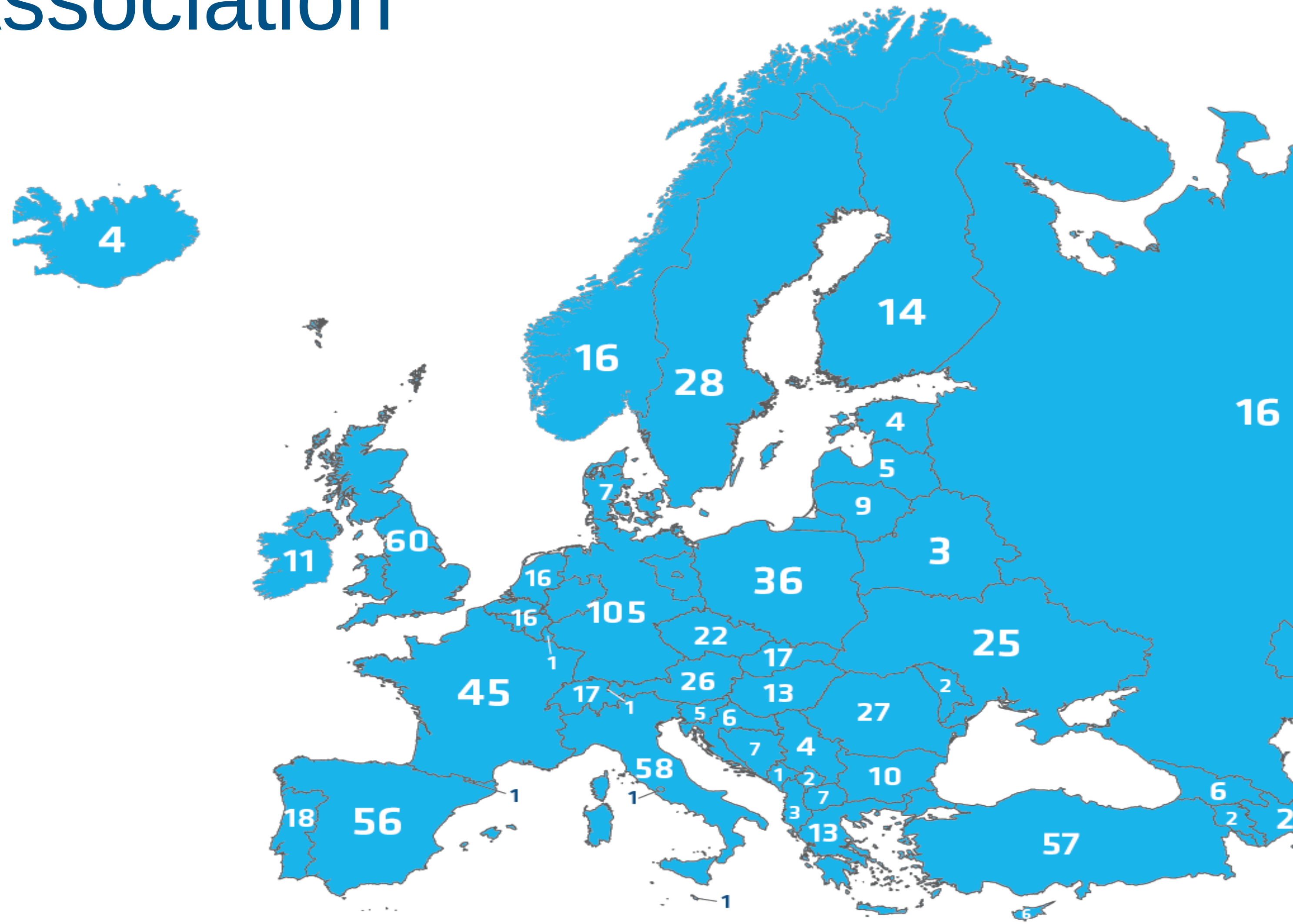
Dr. Lidia Borrell-Damian
Director Research and Innovation

Allianz Forum, Berlin, Germany
06-06-2019

Education, research and innovation funding and policies seeking societal relevance

European University Association

EUA has about 850 members based in 48 countries



Case Study (1)
Energy and Environment as a major societal challenge

Motivation - Global Challenges?

SUSTAINABLE DEVELOPMENT GOALS
17 GOALS TO TRANSFORM OUR WORLD

The Energy Challenge

"…requires new cross-disciplinary approaches, integrating different energy technologies, energy systems, energy economies and markets, and importantly, embracing new regulatory frameworks, and understanding consumer behaviour and societal and cultural dimensions."

Effective solutions must address the whole energy system and its interface with society

For university education → Interdisciplinary working
Challenge based approaches
Cross sector working

The UNI-SET Project

- Mobilising universities to address the skills gap: Building a community of experts through the UNI-SET FP7 project **2014-2017**

4 conferences addressing Research & Education for SET-Plan Priorities

2 conferences on universities engaged for a clean energy future

7 Professional Profile Identification Workshops

- 500+Participants
- 130+Universities
- 100+Organisations, NGOs, etc.
- 40+ Companies
- 40+ Countries

Strategic Needs

Universities requeried to

- Narrow skills gap in higher education and business sector
- Develop novel frameworks for interdisciplinary and innovative energy-related programmes and courses
- Better integrate social sciences and humanities with science, technology and engineering disciplines
- Consider technical, social, economical, political aspects

Challenges ahead

- New technologies & ways of working require new skills
- Curricula, learning & teaching need to adapt
- Expansion of research-based learning, entrepreneurship & innovation skills
- Ability to work with inter-/multidisciplinary challenges and teams
- More attention to holistic & systemic perspectives, especially for complex societal challenges such as energy
- Interface between technical solutions and society needs careful consideration
- Need for specialised experts & scientists – universities play critical role in training and supply of skilled workforce

Examples:

Skill Framework Tables

Developed with the participation of more than 200 Universities and 120 companies

Technical, social, economical & political aspects in energy related to:

- **Industrial/Manufacturing**
- **Environmental**
- **Future Developments**
- **Energy Efficiency**

(FP7 UNI-SET Project Partners)

EUA European University Association | KU LEUVEN | eit InnoEnergy Knowledge Innovation Community

KTH | Grenoble INP | UPC | Jagiellonian University in Kraków | KIT Karlsruhe Institute of Technology

This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 609838

Source Slides 7-11: Energy Transition and the Future of Energy Research, Innovation and Education: An action agenda for European Universities (FP7 UNI-SET)

Action Agenda report (EUA, 2017)

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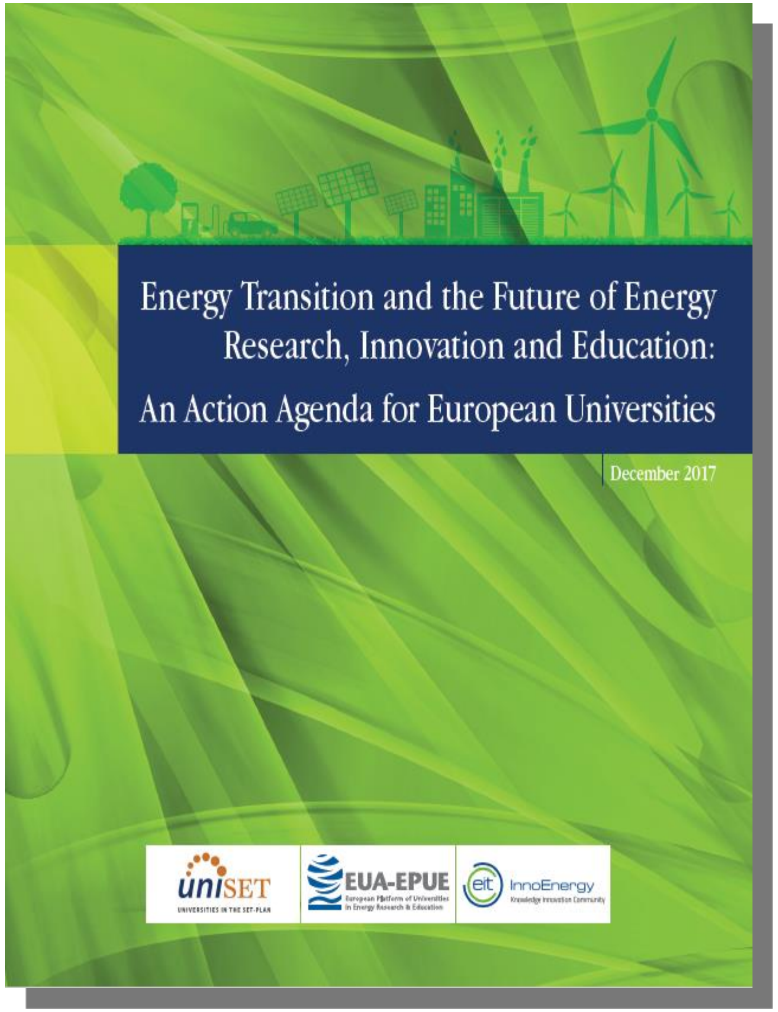

- Narrow skills gap in higher education and business sector
- Novel frameworks for interdisciplinary and innovative energy-related programmes and courses
- Better integration of social sciences and humanities with science, technology and engineering disciplines

2) Energy efficiency | 3) Smart grids & energy systems | 4) Integration of renewables

1) Horizontal content of cross-disciplinary education and research programmes

http://bit.ly/action_agenda

24. Related industrial

Topics (for courses)	Understanding, Background Knowledge, Comprehension, General Appreciation of …	Design and Implementation / Deeper (Master level) Appreciation of …	Employment Skills
Technical	Manufacturing processes and issues	The implementation of waste recovery technologies	Propose solutions for recycling waste
	The impact of wasteful production processes	Minimising manufacturing waste from the design process onwards	Improve product design to minimise waste
	Waste treatment challenges	Design taking many requirements (economic, waste, social, etc.) into account from the start	
Social	The impact of product manufacturing and social acceptance	New products that are socially accepted and have lower environmental impact	Consider social limitations
	Socially acceptable marketing	Marketing the social value of products	Socially acceptable product design and marketing
	Social conflict between perceived and real product value		
Economical	Economic models for manufacturing	Innovative economic models for waste management and recycling	Make recycling profitable
	The economic effectiveness of resolving problems at each design stage	The economic value of waste in a circular economy	Develop circular economy opportunities
	The economic cost of waste		
Political	The legal and political framework for waste management	Adapting legal and governance frameworks to the circular economy	Promote the circular economy
	The impact of the legal framework on sustainable, socially responsible manufacturing	Developing a legal framework to inform people of the social/ environmental impact of products	

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23. Related environmental

EUROPEAN UNIVERSITY ASSOCIATION

Topics (for courses)	Understanding, Background Knowledge, Comprehension, General Appreciation of …	Design and Implementation / Deeper (Master level) Appreciation of …	Employment Skills
Technical	The relationship between technology and the environment - constructive and destructive	The relationship between technology and the environment and how it can be improved	Design new technologies that have lower/ no environmental impact and support the environment
	The environmental impact of using specific materials, e.g. precious minerals	Technology design to aid the environment by taking some basic principles, e.g. circular economy, into account	
Social	The social importance of the environment (food, water, agriculture, etc.)	Methods to improve the understanding/acceptance of living with as opposed to living off the planet	Socially and environmentally aware
	Society's acceptance of the importance of our environment/ planet	Analyse models for the change towards a 'give and take' principle versus a 'take only' approach	
Economical	The economic costs/benefits of getting technology right for the environment	Economic environmental costs	Know that economics is a human construct and that the environment is often 'a given'
Political	Political responsibilities to improve/respect the environment when designing technology	Political responsibility and demands on legislation to ensure respect for the environment	Possess political awareness of legislation and its environmental impact
	Community impact on the development and need for political legislation to support the environment		

20. Future developments

Topics (for courses)	Understanding, Background Knowledge, Comprehension, General Appreciation of …	Design and Implementation / Deeper (Master level) Appreciation of …	Employment Skills
Technical	The time frame of technology design and use	Design technologies that will be compatible with the technologies of the future	Customer/future focused design
	The impact of flexible technology design	Customer centric design	
		Technologies beyond current thinking/incremental change	
Social	Selected, cutting-edge and emerging energy technology innovations	How cutting-edge energy tech science suggests new kinds of behaviours, including those not previously imagined	Identify and promote energy technology innovations for sustainable transitions
	The fact that change is an essential part of life, to be embraced	Consumer interaction to better understand their needs for new developments	
Economical	The applicability and application of the circular economy model	Economic justification of investment to develop revolutionary technologies	Understand economic models and their impact on future developments
		The social enterprise models applicable to the energy sector	
Political	Regulations and incentives in the field of energy, and any incompatibilities and trade-offs	How to steer future legislation	Develop future-proof legislation
	The trade-off between legislation and flexibility	Ensuring application flexibility and avoiding abuse of legislation	

7. Energy Efficiency

Topics (for courses)	Understanding, Background Knowledge, Comprehension, General Appreciation of …	Design and Implementation / Deeper (Master level) Appreciation of …	Employment Skills
Technical	The factors that influence systemic energy efficiency, incl. integrating energy along life cycles and within the spatial/ geographic context	The relationship between life cycle and energy efficiency	Propose energy efficiency measures at process level, potentially driven by data gathering
	Collected data analysis and appreciation of the power of such data, accepting its limitations	Simulation results and data gathered from measured consumption to improve energy efficiency	Propose energy cascades and efficiency improvements in whole life cycles
Social	The deployment barriers for efficiency improvements	Social barriers as part of a holistic analysis to improve implementation/integration	Consider social barriers
	The roles of actors in and impact on efficiency improvements	The impact of (new) technical processes in their spatial and social context	Interact with actors along the value chain/in the spatial context to improve systemic energy efficiency
Economical	Life cycle costs analysis of energy use with regards to generation efficiency	Calculate ROI for existing combined with new installations	Propose profitable and sustainable (costing) solutions
	The impact of pricing scheme trends (e.g. pricing based on kW instead of kWh) on management and new installations		Propose innovative business models for increased energy efficiency (uptake)
Political	Environmental regulations on efficiency and requirements	Adequate incentives for citizens and companies to move towards better energy efficiency	Operate in/create a legal framework
	Potential impact of economic incentives for energy efficiency improvements		

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Case study (2)
Regional Innovation and Smart Specialisation for regional competitiveness

Regional innovation ecosystems - Inter-connected triple helix actors promoting connectivity and seeking coherence in three dimensions

EUROPEAN UNIVERSITY ASSOCIATION

1. **Organisational Coherence:** To achieve connectivity, joint structures set some common decision-making procedures and are based, at least in part, on joint resource allocation.
2. **Social Coherence:** In order to build trust, create mutual support and facilitate interaction, formal events are underpinned by informal events and networks.
3. **Spatial Coherence:** To help serendipity and maximise the chances of encounter, common events, services and technical facilities are provided in common collaborative spaces, making use of geographical proximity to build bridges between separate institutions.

Co-creation structures at Regional levels involving Universities, Businesses and Governments

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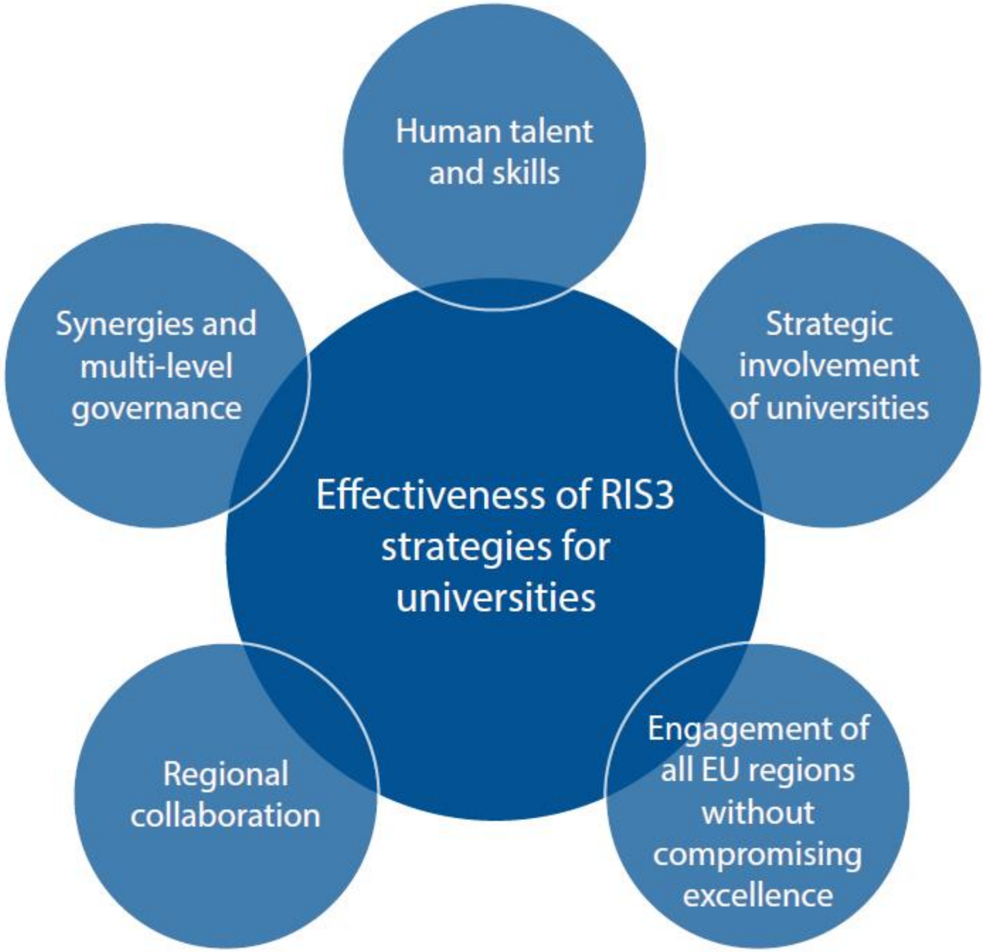
- Strategy networks
- Research thematic clusters
- Start-up or innovation services
- Tech. transfer & innovation services
- Services provided by government agency
- Joint core technical facilities
- Shared large research infrastructure
- University research centres with impact mission
- Joint labs/ interface
- research centres
- Funding and expertise for IP and commercialisation
- Joint campuses, science parks

Maximising the effectiveness of smart specialisation strategies for regional development

Key success factors to maximise the effectiveness of RIS3 strategies from

Universities are key contributors to the development of regional innovation ecosystems.

It is important to fully capitalise on tangible and intangible assets that universities offer for the benefit of culture, society and the economy of their regions.



Maximising the effectiveness of smart specialisation strategies for regional development

Key messages aiming at maximising the effectiveness of smart specialisation strategies for regional development in the post-2020 period:

1) investing in human talent and skills to ensure enduring innovation
2) enhancing the strategic involvement of universities in regional innovation ecosystems
3) promoting the engagement of all EU regions without compromising excellence
4) strengthening collaboration and within the region to induce innovation at the regional level
5) reinforcing synergies and multi-level governance – regional, national, EU

Case study (3)
Open Science

Open Science:

key objectives and

conditions

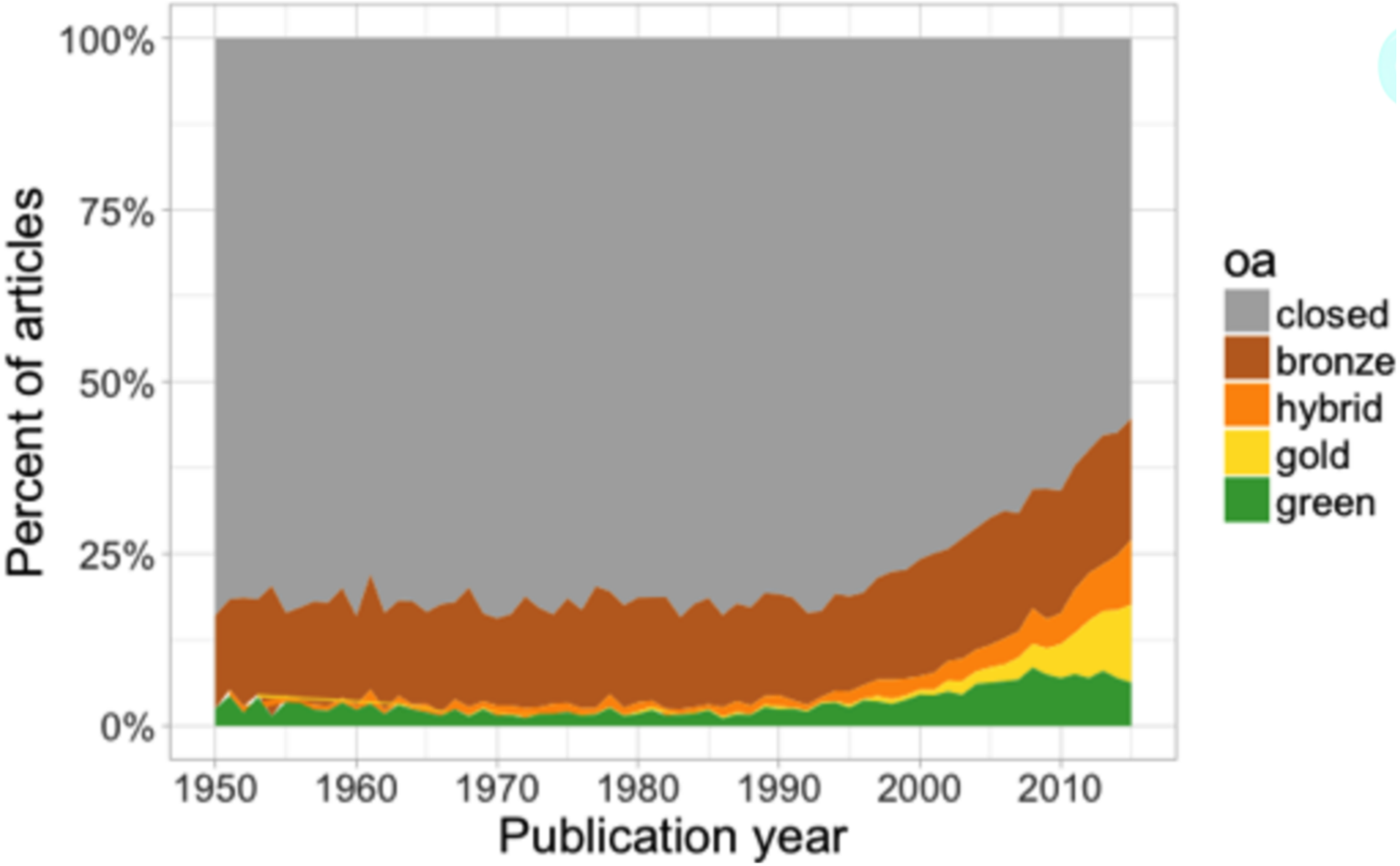
Key objectives:

- Sharing of research-generated knowledge
- Quality of research and research ethics and integrity
- Transparency of the research process and outcomes publication
- Easy and affordable accessibility to research publications and data

Conditions:

- Investment in Open Access business models (cost of publications)
- Investment in e-infrastructure (deposit and access – FAIR principles)
- Policies fostering Open Access to research publications and data
- Researchers motivation and careers

Share of Scholar Publications in Open Access worldwide is far from 100%



Piwowar, Heather; Priem, Jason; Larivière, Vincent; Alperin, Juan Pablo; Matthias, Lisa; Norlander, Bree; Farley, Ashley; West, Jevin; Haustein, Stefanie (2018-02-13). "The state of OA: a large-scale analysis of the prevalence and impact of Open Access articles". PeerJ. **6**: e4375. doi:10.7717/peerj.4375. ISSN 2167-8359. PMC 5815332. PMID 29456894.


2019 Big Deals Survey Report
An Updated Mapping of Major Scientific Publishing Contracts in Europe

By Rita Morais, Lennart Stoy and Lidia Borrell-Damián

May 2019

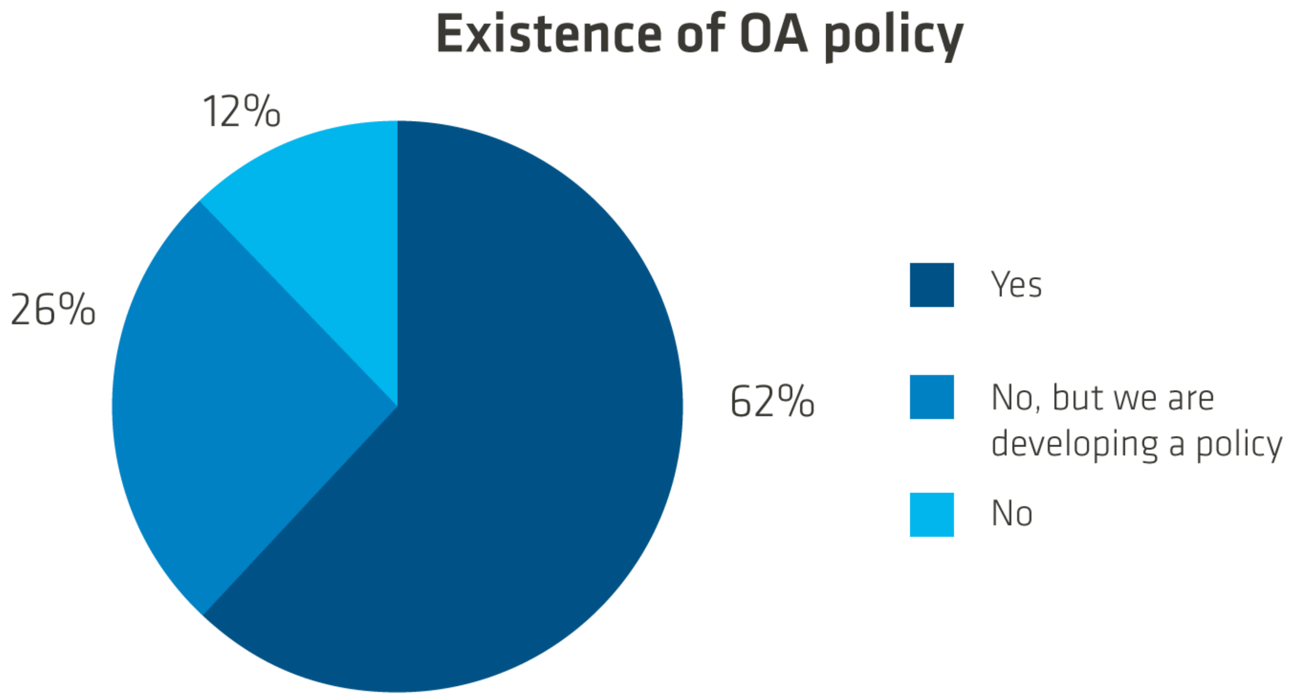
Key information

- Data collection: August-November 2018
- Respondents:
- 31 Consortia negotiating on behalf of the university sector and other higher education and research performers
- Focus: Periodicals
- 5 major publishers (Elsevier, SpringerNature, Taylor & Francis, Wiley, American Chemical Society)

- Data analysed in aggregated fashion
- Most data refers to big deal contracts ongoing in 2017 or 2018

88% of institutions have an Open Access Policy or are developing one

EUA Open Access Survey 2017-2018 :



EUA Big Deals Survey 2018

EUROPEAN UNIVERSITY ASSOCIATION

European total annual expenditure on ‚big deals'

For all subscriptions to electronic resources (including periodicals, databases, e-books) by national consortia:

Total (30 European countries) = ~ 1 025 253 055 EUR (estimate for 2018, 3.5% annual rate increase)

This is a conservative figure not including:

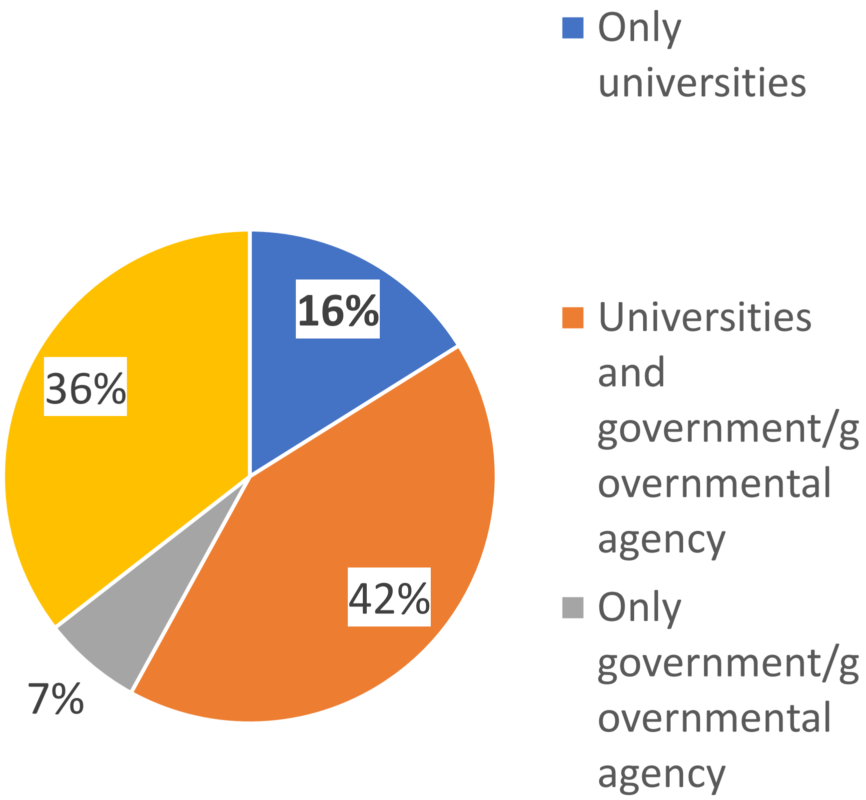
- *Article Processing Charges (APCs) – estimated currently at 10% of the cost of subscriptions*
- *Consortia other than those participating in the Survey*
- *Individual institutional contracts with publishers*

For periodicals only in the surveyed consortia:

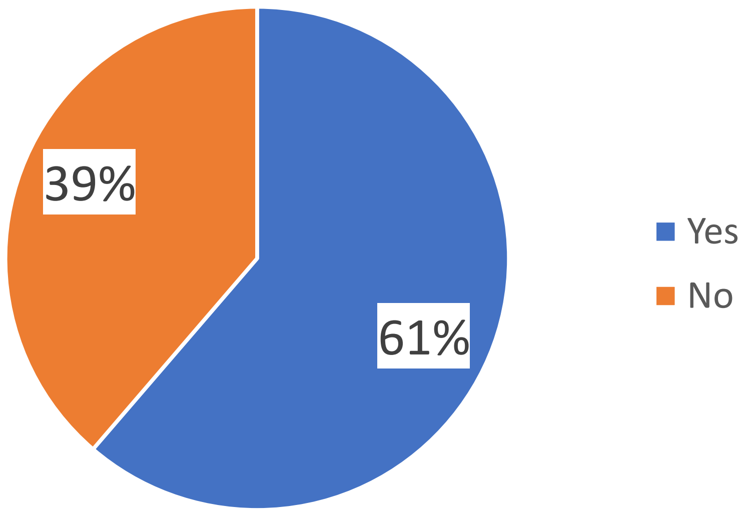
Total (31 consortia, representing 30 European countries) = ~ 726 350 945 EUR (average yearly increase 3.6%)

Proportion of costs covered by universities in the consortia = 519 973 578 EUR (~72%)

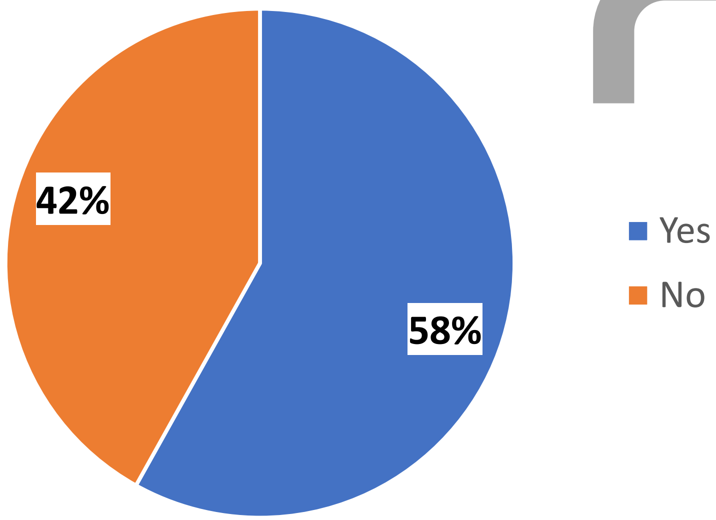
Origin of funds for big deals



Publicly available information on expenditure on electronic documentary resources

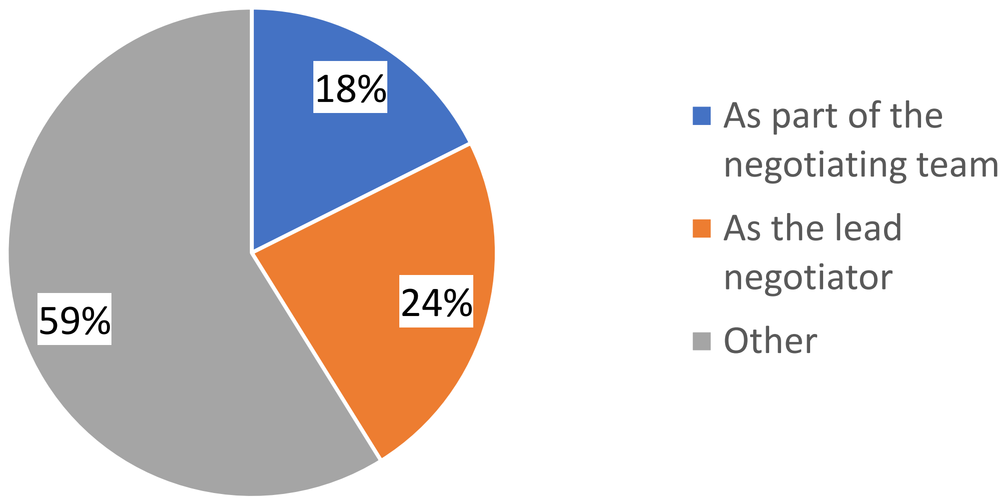


University leadership role in the negotiation of big deals



n= 31/31

The university leadership has a role:



n= 17/18

Other includes: negotiation only for some publishers; defining strategy.

Thank you for your attention

Dr Lidia Borrell-Damián
lidia.borrell-damian@eua.eu

Stakeholder and co-creation

Henning Kroll

Project manager,
Fraunhofer ISI, Germany

RESEARCH INFRASTRUCTURES AND SOCIETY – HOW IMPACT SUBSTANTIATES THROUGH CO-CREATION

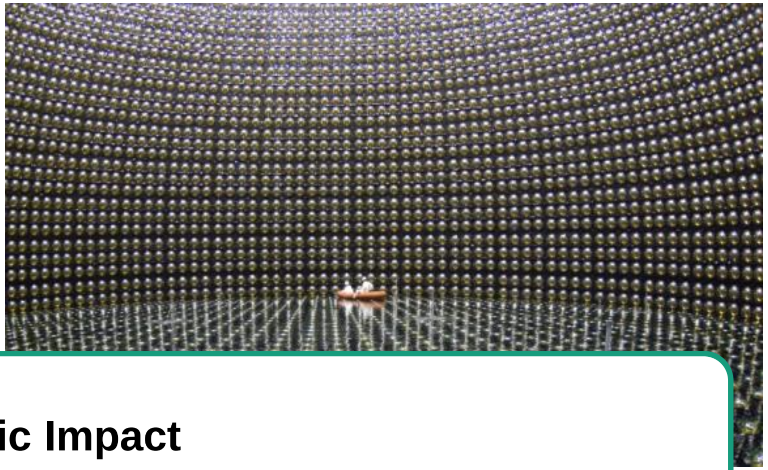
Henning Kroll, Fraunhofer ISI

06 / 06 / 19

Foto: © iStockphoto.com/Alexandr Tovstenko

Fraunhofer ISI

Research Infrastructures and Impact

Scientific Impact

Economic Impacts

Human Capital Impacts

Societal Impacts

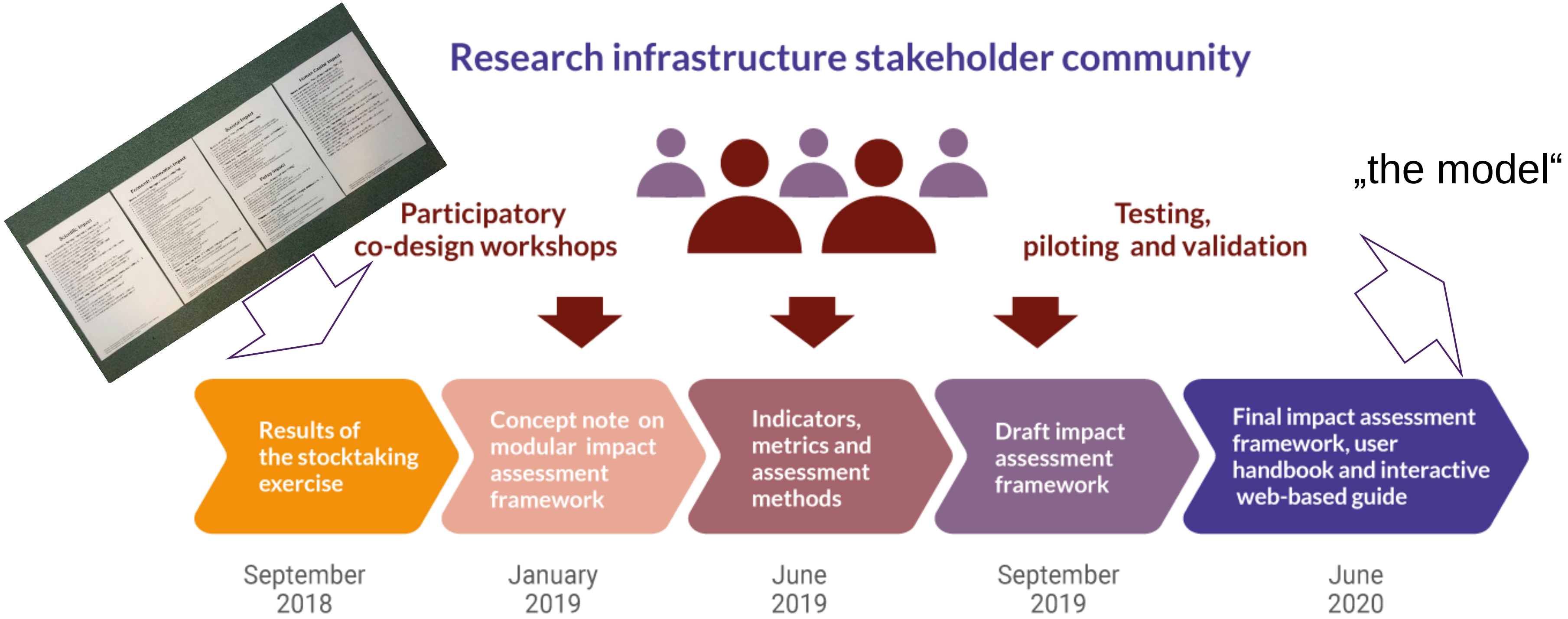
Policy Impacts

Research Infrastructures and Impact

- January 2018 – June 2020 (30 months)
- 8 project partners, 4 analysts, 4 research infrastructures
- research infrastructures co-design and pilot the impact assessment methods
  CERN, DESY, ALBA, ELIXIR

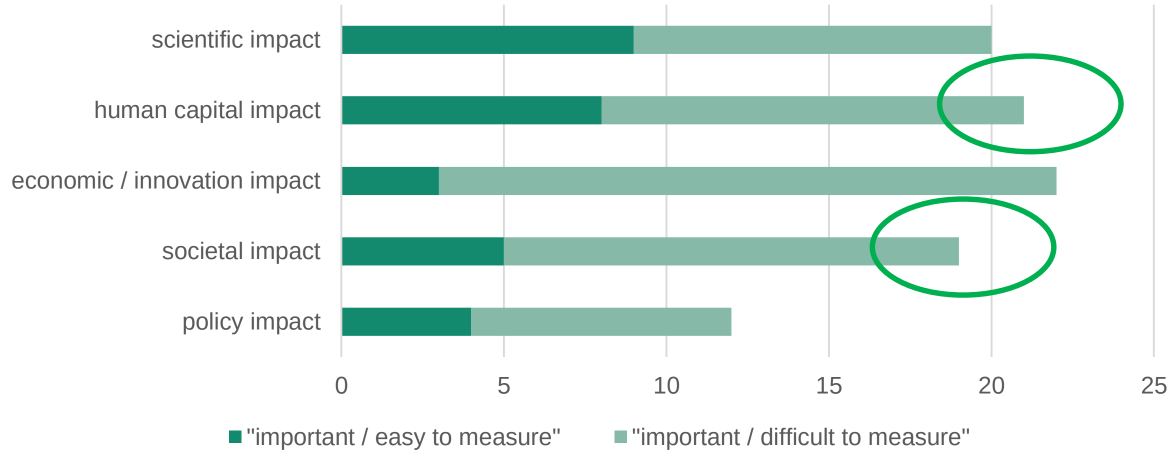
  Effort: 100+ person months, Budget: ~ € 1.5m
- improve the understanding of how impact materializes
  through different **impact pathways (logics of impact creation)**
- understand commonalities and differences between
  different types of research infrastructures
- Give policy makers, funders and RI managers new
  tools to assess RI impact on the economy and contribution to society.

Our Findings Themselves: Co-Created

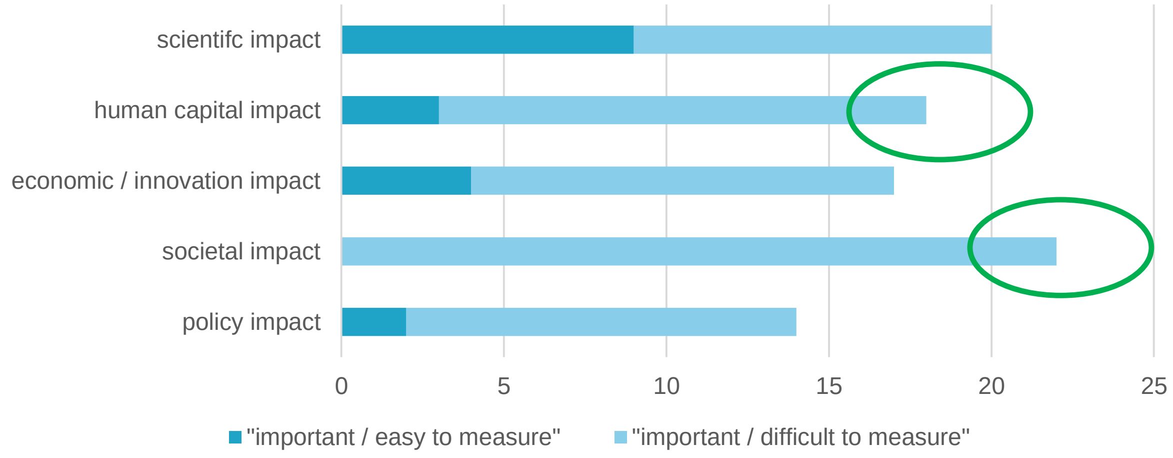


What RI managers tell us they want to show

Single-Site
Hard Science

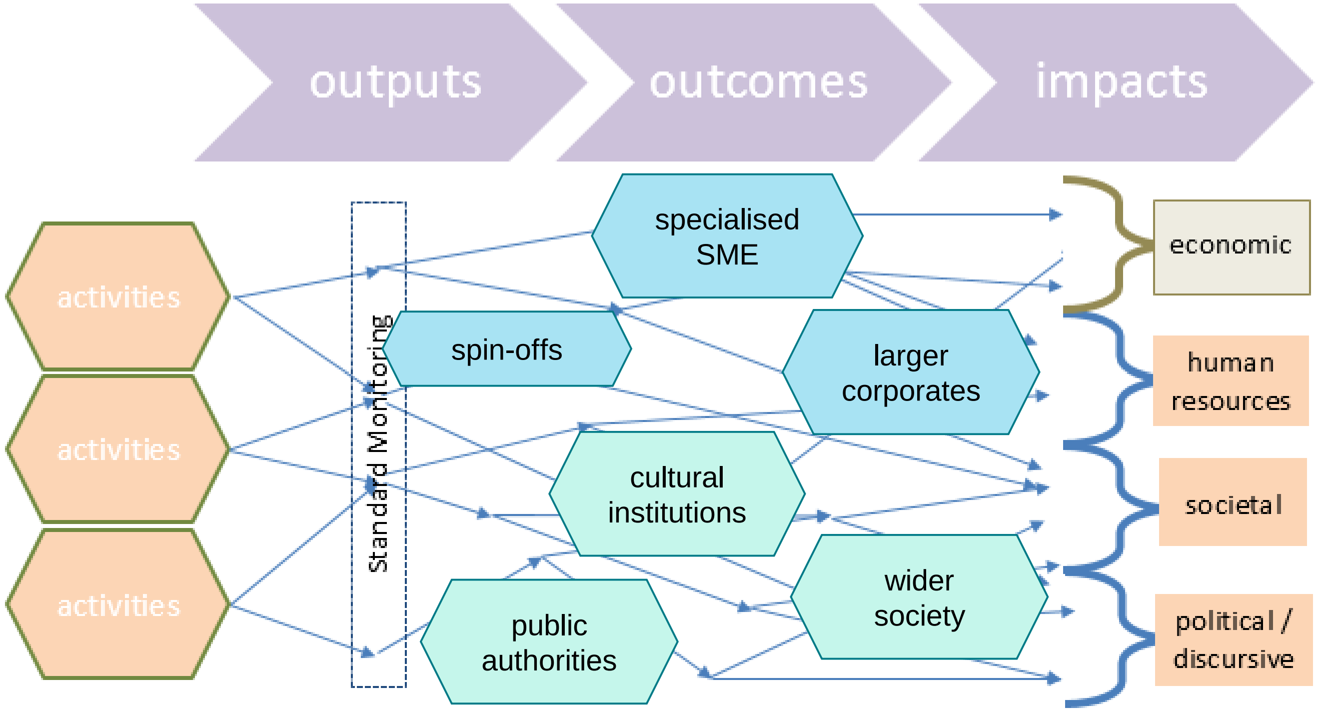


Networked/Virtual
Diverse Sciences



Impacts: A long way away from action

- **only impact that occurs without co-creation is that of being there**
  - but this also applies to hotels, factories and swimming pools...
- for all others: **knock-on effects, mediators & relays crucial**



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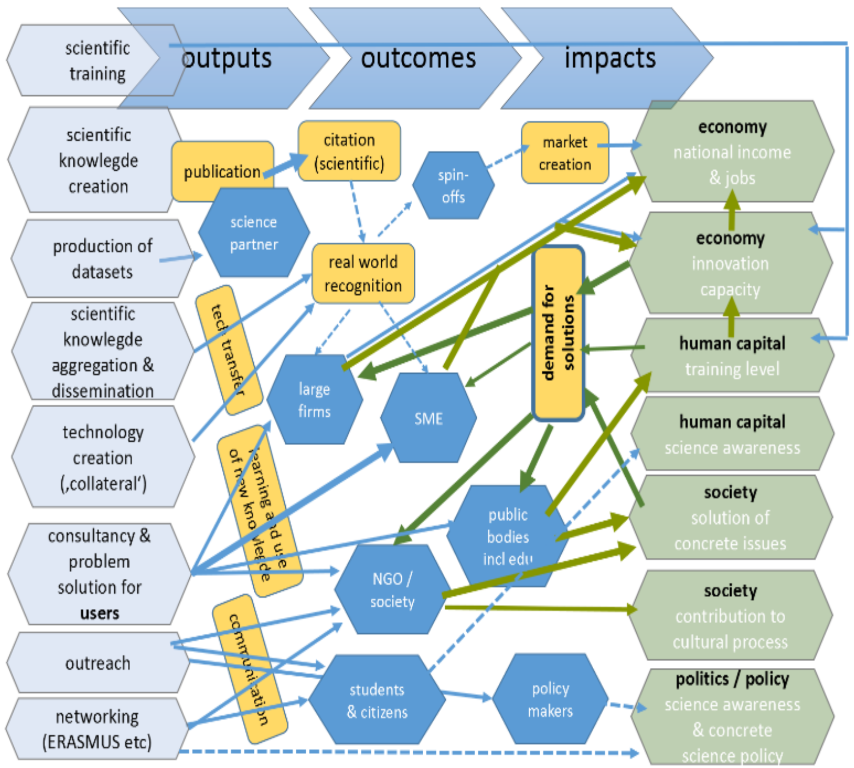
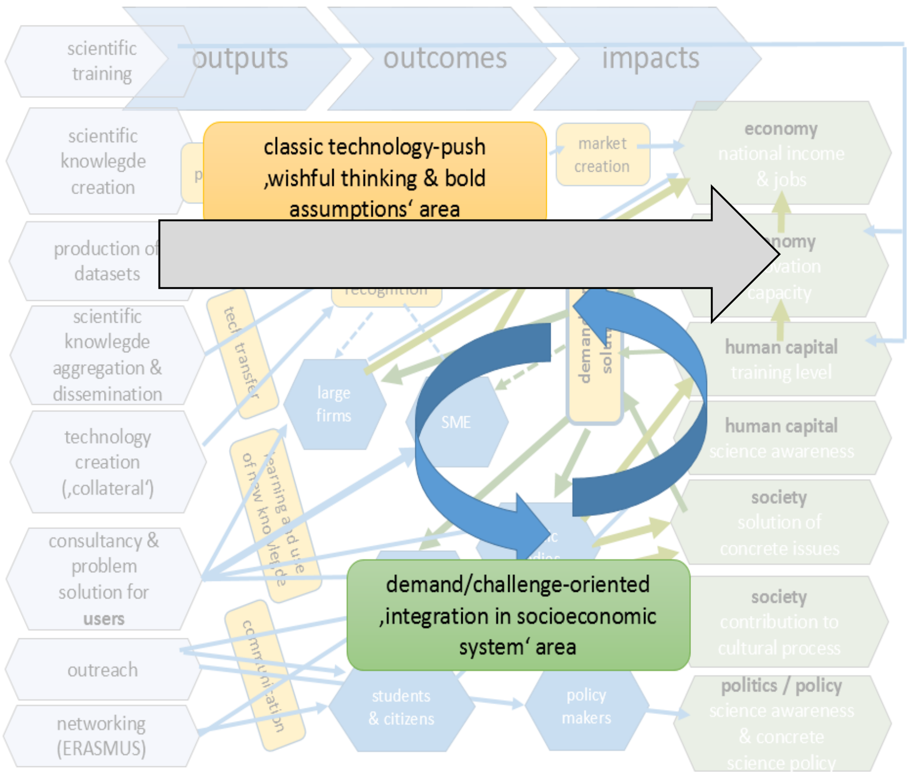
Impacts: Co-creation vs. Diffusion

- knock-on effects, effects stuck half way, **mediators & relays crucial**





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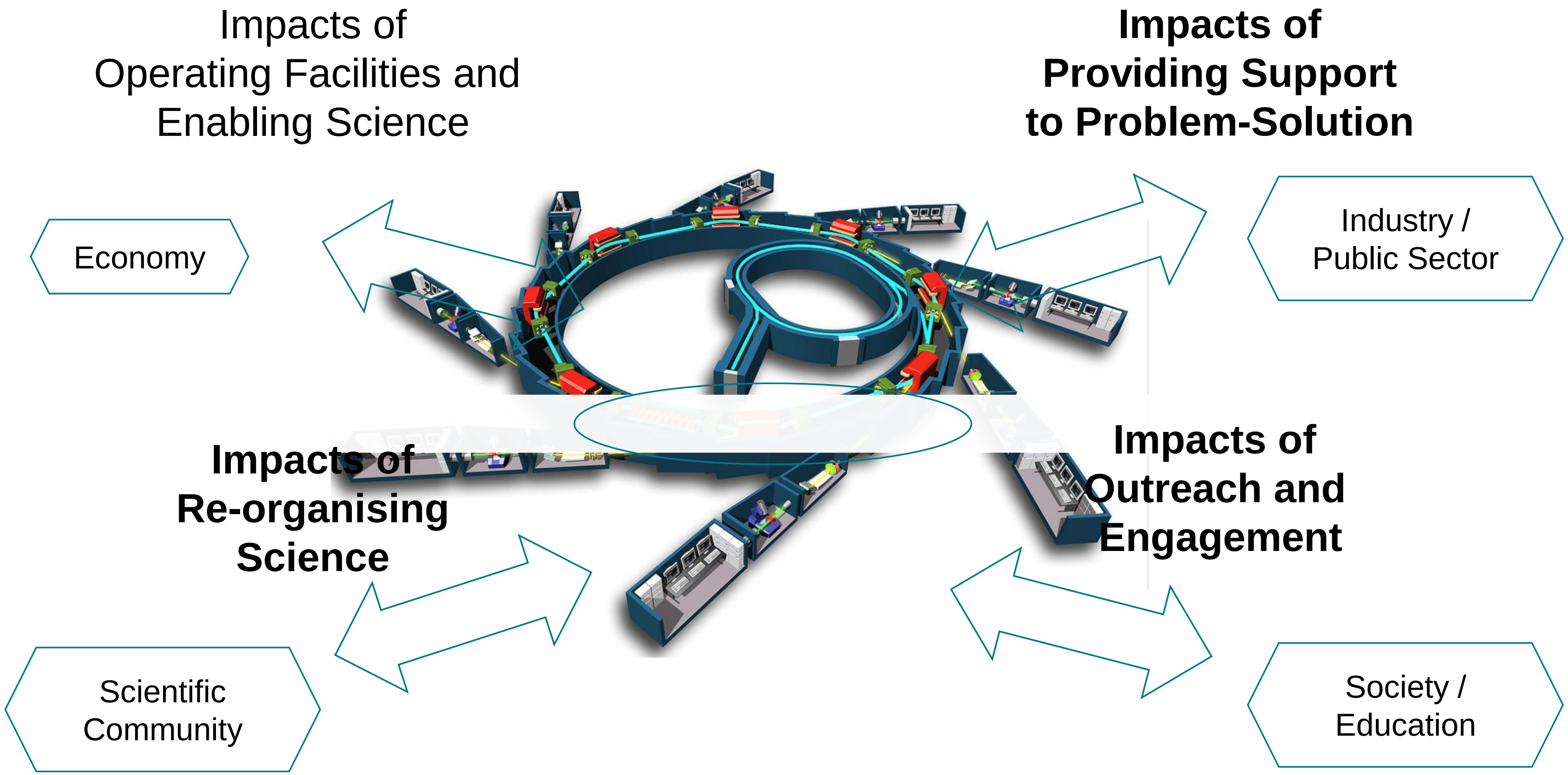
Co-creation with society: How and where ?



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Co-Creation in Science defines New Frontiers

I. impact through contribution to problem solution (industry, authorities, ...)
II. network effects (research consortia, alumni, ...)
III. impact of opening science to new communities (broader public, pupils, ...)

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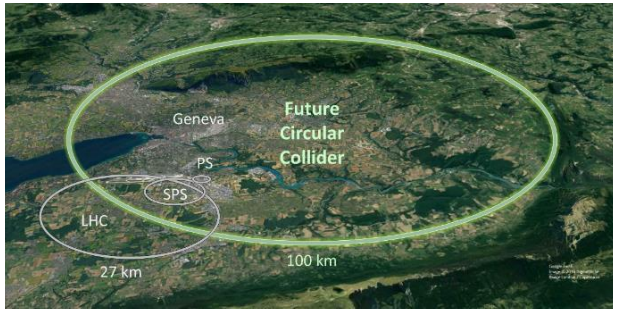
Single-site Infrastructures

- Underestimated Basis for Co-creation

  Diverse actual modes of collaboration with external partners



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ALBA – centre for synchrotron light based
scientific and industrial applications

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Case Center
for Synchrotron Biosciences

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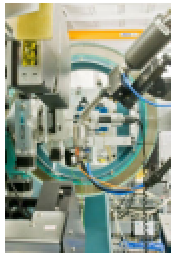
Industry as a „Pro-sumer of Science“? ...



Utilization of beamtime

- 573.68 €/per hour

Scientific support services

Standard scientific support

- Provision of support in dayti
  Monday to Friday: 50.20 €/h
- Provision of support to daytime
  on weekends or at night, Monday
  to Friday: 56.48 €/ho
- Provision of support a
  weekends: 62.75 €/ho

Specialized scientific support

- Provision of support in d
  Monday to Friday: 64.08 €
- Provision of support to da
  on weekends or at night, M
  to Friday: 72.09 €/hour
- Provision of support at nigh
  weekends: 80.10 €/hour

INDUSTRIAL SECTORS

- CHEMISTRY
- ADVANCED MATERIALS
- NANOTECHNOLOGY
- PHARMACEUTICAL
- HEALTH
- FOOD AND AGRICULTURE
- ENVIRONMENT
- AUTOMOTIVE AND AEROSPATIAL
- ENERGY
- CULTURAL HERITAGE & FORENSIC SCIENCES

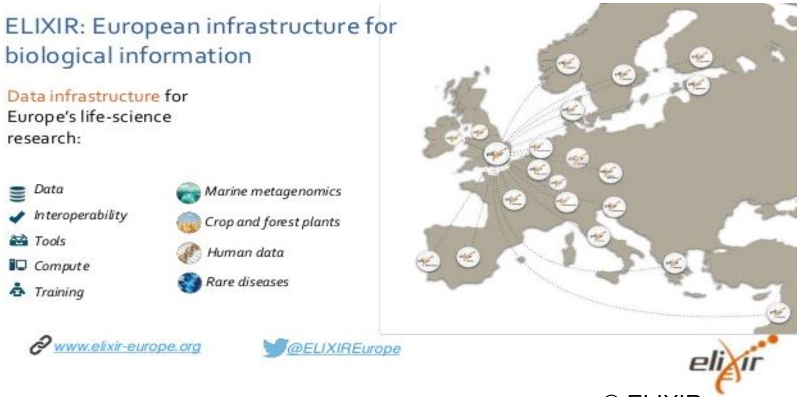
public sector

https://www.cells.es/en/industry/industrial_applications_baja.pdf

Networked Infrastructures

- Enabling new ways of Scientific Co-creation:

  Provision of curated / edited data to scientific and societal users



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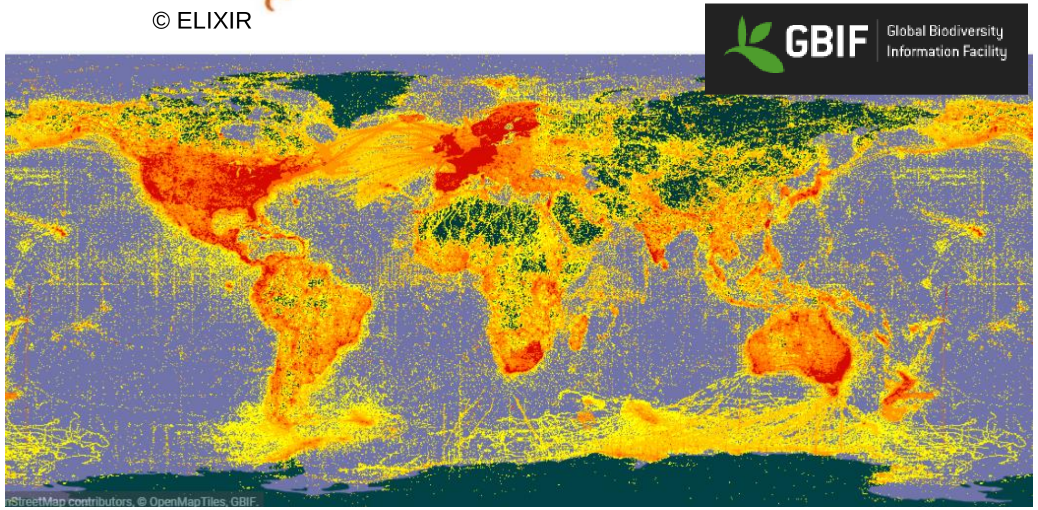

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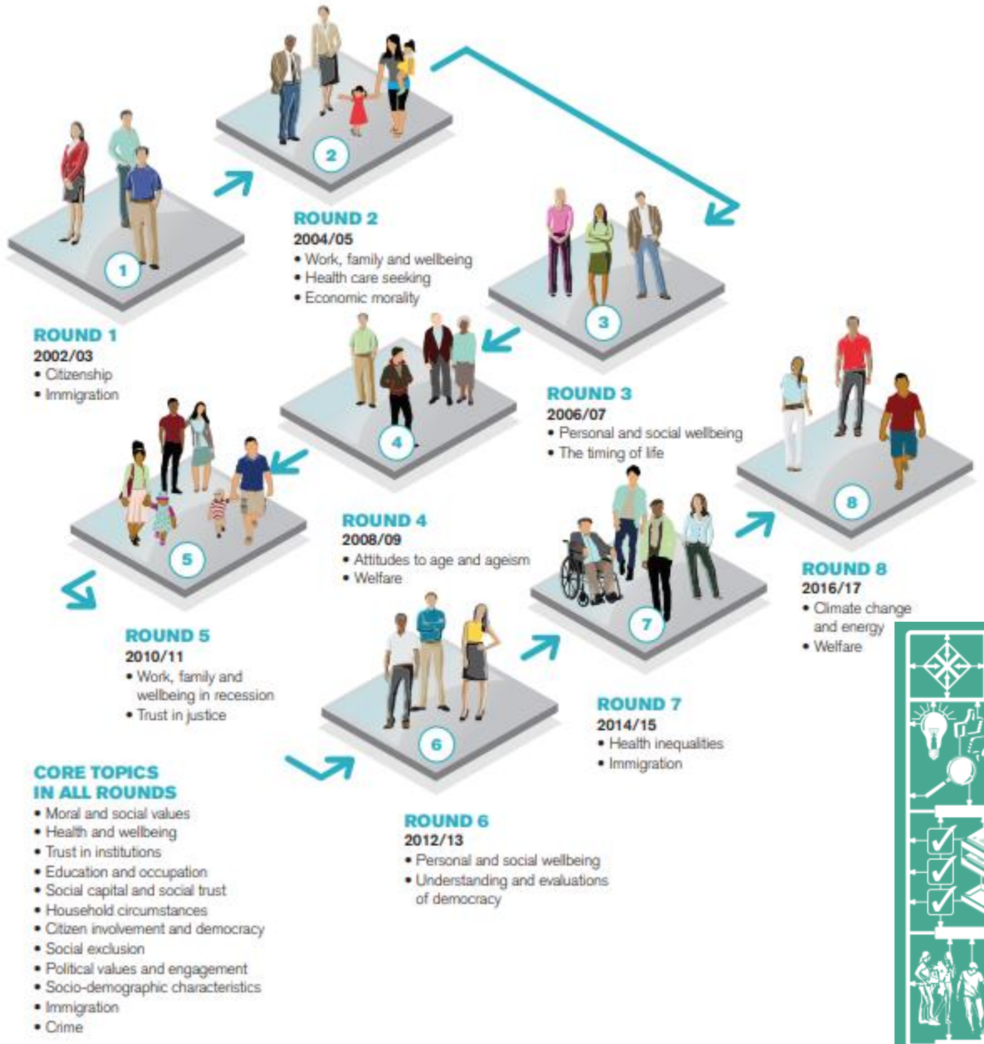
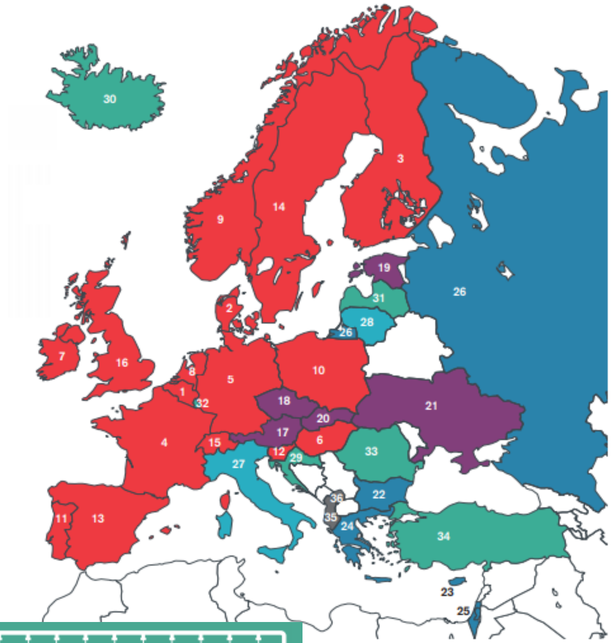
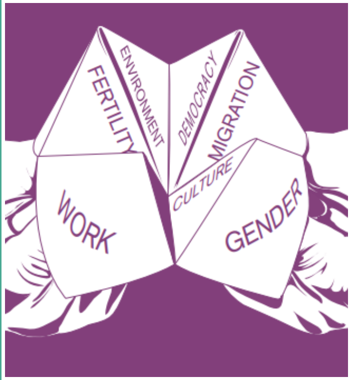
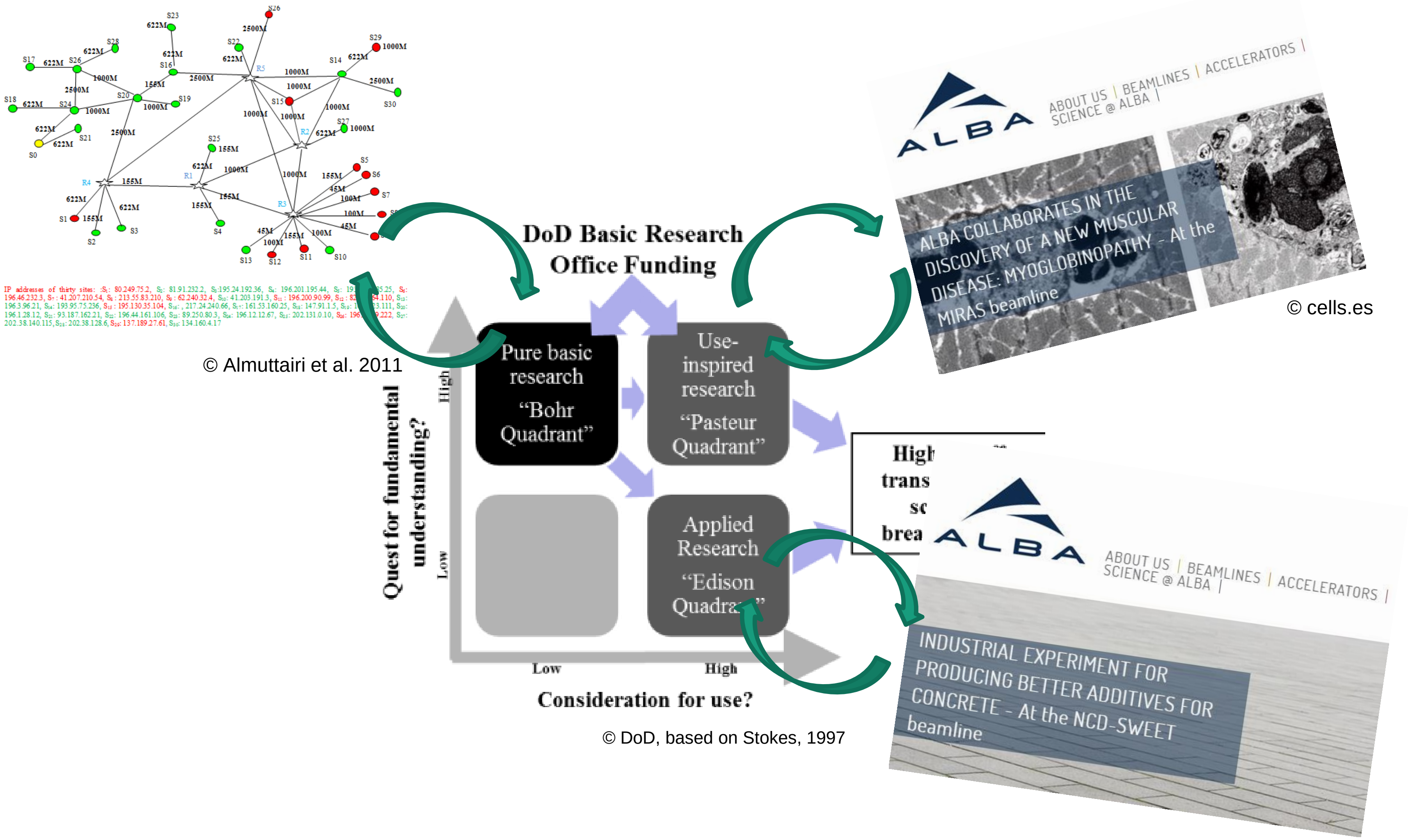
Society as a „Pro-sumer of Science“? ...







Summary: RI Co-Creation in Theoretical Terms



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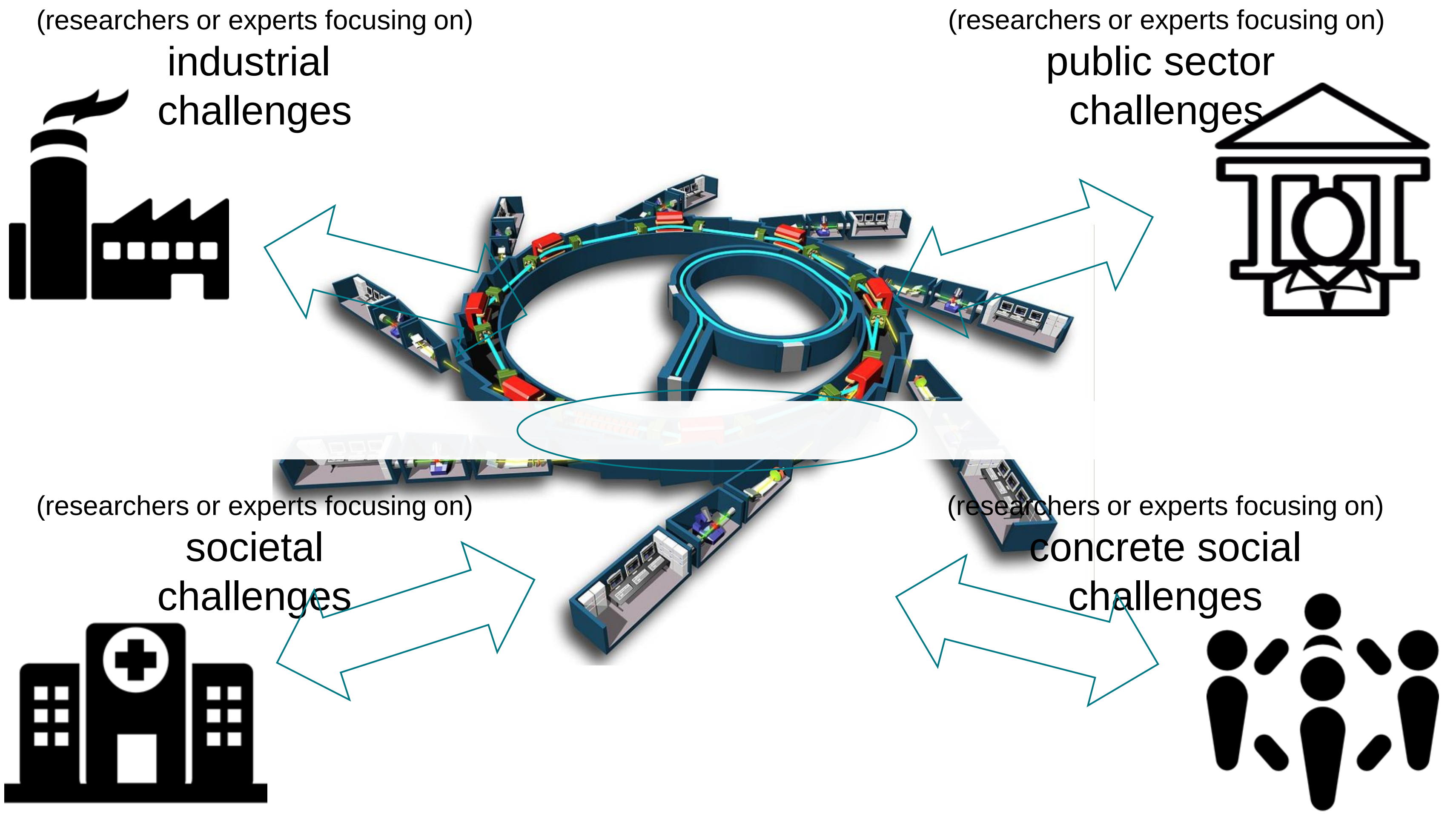
Summary: RI Co-Creation in Practical Terms



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Thank you for your attention !

Henning Kroll

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RI PATHS
Research Infrastructure imPact Assessment paTHwayS

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