Responsible innovation in Europe? Addressing grand societal challenges

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Overview

- Where we stand: innovation, systems, and policy
- Were we might go: future transformations in innovation and policy?
- Policy ambitions in Europe:
  - Grand Societal Challenges and Innovation Policy
  - Responsible Research and Innovation (RRI)

Innovation: where we stand (1)

- Shared strong belief: Innovation is indispensable for socio-economic development towards welfare (OECD).
- OECD: *"Technological product and process (TPP) innovations comprise implemented technologically new products and processes and significant technological improvements in products and processes. A TPP innovation has been implemented if it has been introduced on the market (product innovation) or used within a production process (process innovation). TPP innovations involve a series of scientific, technological, organisational, financial and commercial activities."*
- *"… the differences between countries in terms of 'pure' innovative efforts (as primarily indicated by patents, hence not including catching-up) become more and more important for explaining differences in growth performance."* (Fagerberg & Verspagen 2002, 1303).

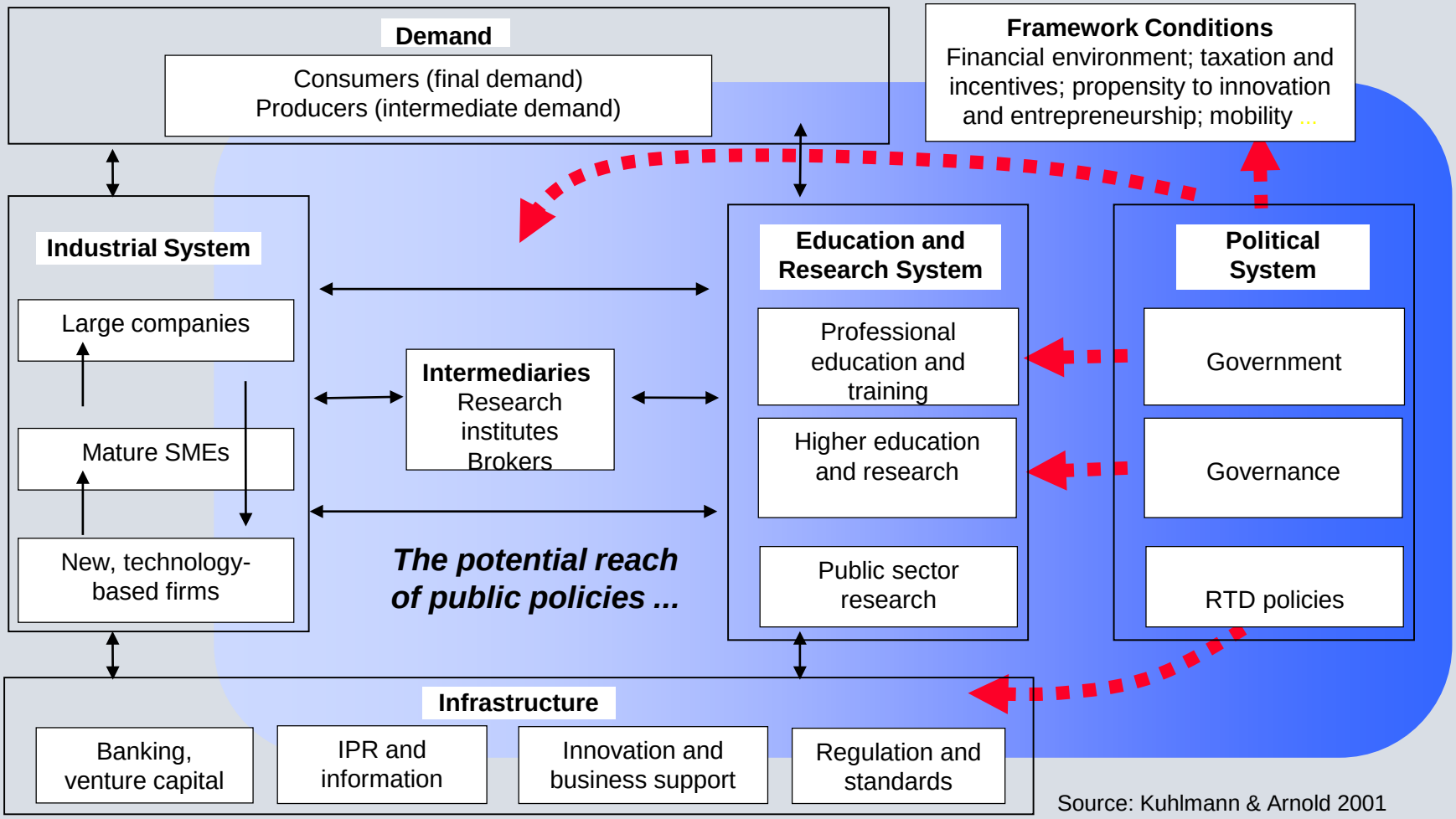
Whe Innovation: where we stand (2)

- Innovation occurs in uncertainty
- Innovation is path-dependent
- Innovation co-evolves with society
- Innovation draws on varieties of actors
- Innovation builds on actors' learning capabilities

Innovation: where we stand(3)

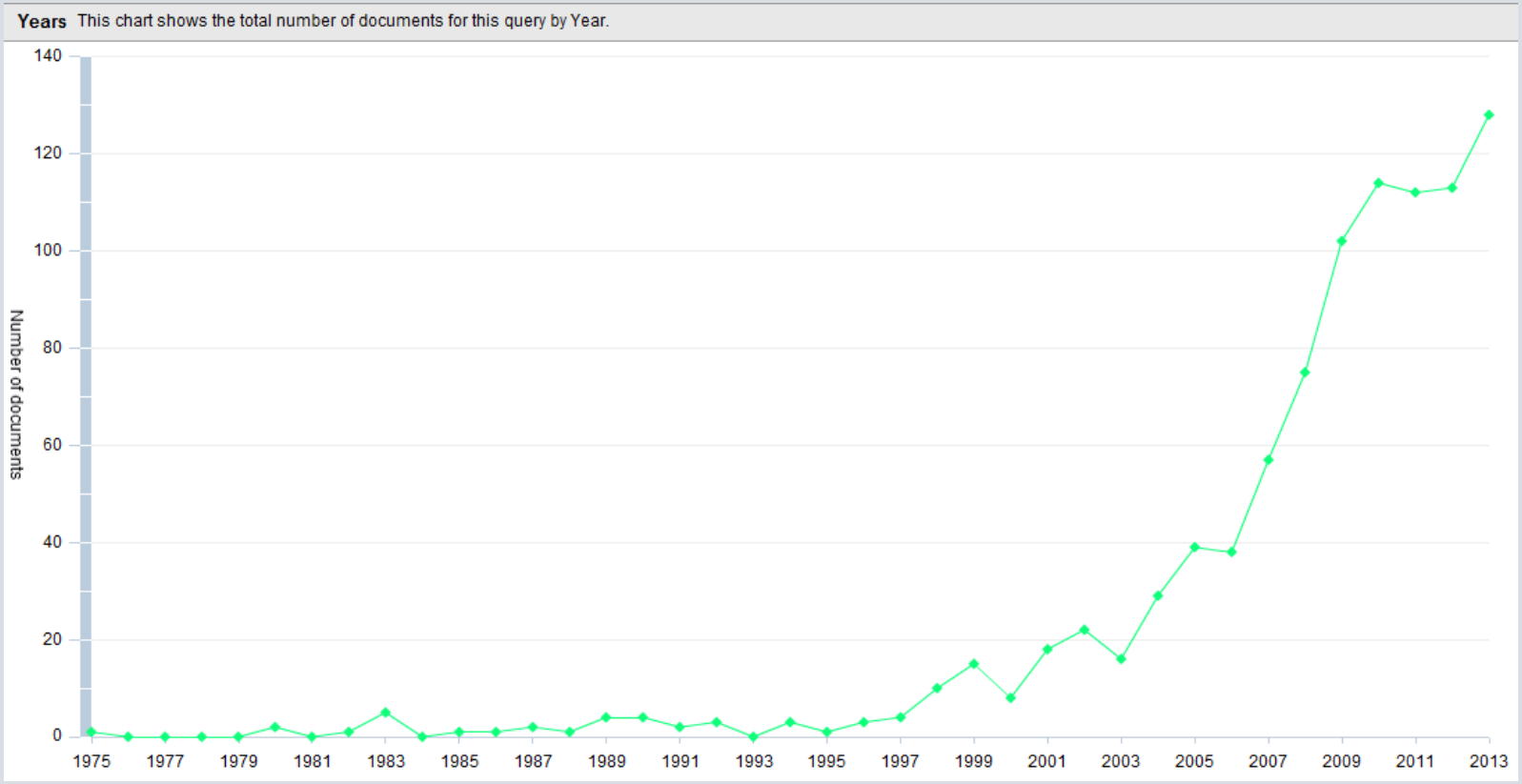
- Often, innovation is spurred by vivid interfaces with science and ‘high technology’
- Often, innovation is driven by demand (including non- or low technological)
- Innovation builds on ‘soft factors’ (e.g. innovation related services)
- Innovation is shaped by institutional contexts and public policy

Where we stand: innovation (eco)systems



Source: Kuhlmann & Arnold 2001

Rise of ‘innovation policy’ in social sciences



Academic publications 1972 -2013 with term ‘Innovation policy’ in title, abstract or key words (total 934), in Scopus-listed Social Sciences & Humanities titles (> 5,300)

Where we stand: innovation policy

- Ever growing scope of innovation governance and policy instruments in OECD countries
- Justification: from 'market failure' to 'system failure' (e.g. Chaminade&Edquist 2010; Fagerberg 2014)
- Instruments increasingly 'systemic' (Smits & Kuhlmann 2004)
- Major innovation policy goals (*Compendium of Evidence*, Edler et al. 2013)
  - increasing research and development investment
  - augmenting skills
  - enabling access to expertise
  - strengthening system-wide capabilities and exploiting complementarities
  - enhancing innovation demand
  - improving frameworks for innovation, including regulation and standards
  - facilitating exchange and dialogue about innovation.
- Continuously broadening scope of economic and social areas covered by innovation governance and policy efforts (e.g. Niinikoski & Kuhlmann 2014)

Scope and goals of innovation policy (Edler et al. 2013)

Report Title and Instruments	Overall orientation		Goals						
	Supply	Demand	Increase R&D spent	Increase non-financial capabilities		Systemic capabilities, complementarities	Enhance demand for innovation	Framework	Discourse
				Skills	Access expertise				
Fiscal Incentives for R&D	●●●		●●●	●○○					
Direct Support to R&D and Innovation in Firms	●●●		●●●						
Access to Finance, Publicly Supported Venture Capital and Loan Guarantees	●●●		●●●						
Policies for Training and Skills on Improving Innovation Capabilities in Firms	●●●			●●●					
Innovation and Human Resources Migration and Employment Protection	●●●			●●●					
Support Measures for Exploiting Intellectual Property	●●●				●●●			●○○	
Entrepreneurship Policy	●●●				●●●				
Technical services and advice	●●●				●●●				
Cluster Policy on Innovation	●●●					●●●			
Policies to Support Collaboration for R&D and Innovation	●●●		●○○		●○○	●●●			
Innovation Network Policies	●●●					●●●			
Measures to Stimulate Private Demand for Innovation		●●●					●●●		
Public Procurement Policies		●●●	●●○				●●●		
Pre-Commercial Procurement	●○○	●●●	●●○				●●●		
Innovation Inducement Prizes	●●○	●●○	●●○				●●○		
Standardisation and Standards	●●○	●●○					●○○	●●●	
Regulation	●●○	●●○					●○○	●●●	
Technology Foresight	●●○	●●○							●●●

[1] Stars denote the relevance of the overall orientation and the stated goals of innovation policy to the various innovation policy instruments and respective *Compendium* reports that cover these instruments (●●●: strong relevance, ●●○: moderate relevance, ●○○ minor relevance).

Grand Societal Challenges (EU Horizon 2020)

- Health, demographic change and wellbeing;
- Food security, sustainable agriculture and forestry, marine and maritime and inland water research, and the Bioeconomy;
- Secure, clean and efficient energy;
- Smart, green and integrated transport;
- Climate action, environment, resource efficiency and raw materials;
- Europe in a changing world - inclusive, innovative and reflective societies;
- Secure societies - protecting freedom and security of Europe and its citizens.

Governing Grand Challenges?

- Orientation towards Grand Challenges (GC) creates a **challenge** for science, technology, and innovation (STI) **policies** (Kuhlmann & Rip 2014).
- GC as priorities for R&D and innovation stimulation?
- GC = Manhattan Project or Apollo Project = unambiguous?
- Rather, GC pertain to **heterogeneous** (also "new") actors and forces, to be mobilised, guided and **integrated**, including **social** innovation.
- **GC: open-ended missions, concerning the socio-economic system as a whole, involving heterogeneous actors, even inducing (or requiring) *system transformation.***

Our take on the 'other Grand Challenge'

- No one-fits-all policy approach
- Go for *tentative policy mixes, also facilitating system changes* where relevant
- Policy mixes can draw on
  - classical priority setting and implementation approaches
  - on transformation in science (systems) or breakthrough innovation
  - demand-side and procurement policies
- ... and will focus on system-oriented strategic interventions, experimental in design, including out-of-the-box approaches, new combinations of actors and alliances.

Orchestrating new actor constellations

- Make sure that *key actors* are involved, next to public policy and industry also e.g. charitable foundations, Civil Society Organisations (free to move, tend to go for public interest goals).
- Combined economic and social changes require also *social innovation.*
- Enable *intermediary organisations* and spaces for interactions to enable and improve concerted action, without a master plan.
- Concerted action requires new capacities and capabilities, so *learning* and transformation is needed.

➢ *Government as coordinating actor* required: stable, trustable, non-partisan, ready to invest (e.g. EU) (Mazzucato 2013).

Example
Joint Technology Initiative

- Innovative Medicines Initiative (IMI)
- Aiming to “improve health by speeding up the development of, and patient access to, innovative medicines, particularly in areas where there is an unmet medical or social need”.
- partnership of EU (H2020) and European pharmaceutical industry (European Federation of Pharmaceutical Industries and Associations).
- Associate or project partners: patients, regulators, procuring organisations.
- €3.3 billion budget for the period 2014-2024 (from EU, industry, associate partners).

➢ Enabled and concerted by European Commission (FP6, FP7)

Concertation through tentative governance

- Major **public-private initiatives** coping with the transformative potential of a GC need a ‘tentative’ concept of governance (Kuhlmann et al. 2015).
- **Tentative governance** is designed, practiced, exercised or evolves as a particularly dynamic process to manage interdependencies and contingencies in a non-finalizing way; rather prudent and preliminary than prescriptive and persistent.
- It creates **spaces of openness, probing and learning** instead of trying to limit options for actors, institutions and processes.

Meta-governance

- Tentative governance includes a *meta-governance* dimension (Jessop 2002).
- Meta-governance ('governance of governance') is visible in emerging modes of 'social technologies'
  - Facilitating and framing articulation,
  - Allowing for contestation and negotiation of competing views.
- Functioning working as a 'crash barrier' guiding the ongoing 'making' of governance across the various domains of the research and innovation system effectively.
- E.g. rules (explicit and implicit) for international cooperation to address Grand Challenges through innovation.

Responsible Research and Innovation (RRI)

- RRI: a combination of earlier concepts, e.g. CSR; Technology Assessment; Precautionary Principle; Ethical and Legal Aspects of innovation; …
- Addressing questions which direction research and innovation should take
  - Grand Scietal Challenges
  - anticipation of risks and taking ethical concerns into consideration
  - aligning technology and innovation with societal demands and values
- Suggestions how to perform and govern research and innovation *responsibly* include
  - involvement of stakeholders
  - encouragement of actors‘ responsiveness and forward-looking attitude

RRI becoming a central feature of R&I policy in Europe

- Responsible innovation initiatives in the United Kingdom, The Netherlands, Norway...
- Cross-cutting issue in EU Framework Programme Horizon 2020
- EU Commission: SWAFS unit in DG Research promoting RRI
- Rome Declaration on RRI in Europe (2014)

  " [...] *the conditions are now right for responsible research and innovation to underpin European research and innovation endeavour and therefore call on all stakeholders to work together for inclusive and sustainable solutions to our societal challenges."*
- EIRMA (European Industrial Research Management Association): task force on Responsible Innovation

Governance of RRI: 'Responsibilisation'

- The governance of RRI is still **evolving**, (e.g. FP7 "Res-AGorA – Governance framework for Responsible Research and Innovation (RRI)" (Walhout & Kuhlmann 2014).

- Towards a **'responsibilisation'** (Dorbeck-Jung 2013) of research and innovation systems.
- **RRI Navigator**: a thinking tool decision-makers in research and innovation organisations
- Three key areas:
  - **Quality of interactions** (inclusion; moderation; deliberation)
  - Organising **governance mechanisms** (flexibility; subsidiarity; adaptability)
  - **Supportive conditions** (capability & capacity building; institutional entrepreneurship; democratic standards)

In conclusion

- Coping with complex phenomena like Grand Challenges and of introducing 'responsibility' in innovation requires
  - A systemic approach
  - Inclusion of societal actors
  - Experimentation and learning
  - Tentative governance

- Need for analytical and policy intelligence
- See: "European Forum for Studies of Policies for Research and Innovation" (Eu-SPRI Forum)

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