# *Responsible Research and Innovation: Horizon 2020 & Policy signals from the European Union*

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# understanding of the European Union's Horizon 2020 (2014-2020)

- **Horizon 2020**
- H2020 will take over from the framework programmes, from 2014 to 2020.
  - Pillar1 – Excellent Science (novel, Future & Emergent Technologies, FETs)
  - Pillar 2 – Industrial Leadership (Key Enabling and Industrial Technologies , KETs)
    - Micro & nanoelectronics, nano–, photonics, advanced materials, advanced manufacturing)
  - Pillar 3 – Societal Challenges (Food, Energy, Smart/Green Transport, Climate Action)
  - Under the new Programme within H2020 : 'Science With and For Society'
  - EC pre–H2020 .The European Commissions' Ideal of RRI – Principal Values as enshrined in the EU Charter of Fundamental Human Rights:
  - Ethical & Policy Anchor points – Dignity, freedoms, justice, equality, solidarity & citizens rights (EC2012)

# Rene Von Schomberg ('not' the European Commission)

- *PRE- H2020*
- *"Responsible Research and Innovation is a transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view on the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products* (Von Schomberg 2011,2012,)"

# Distinguishing rri/RRI

- See Rip (2010) 'de-facto governance'.
- Developing Rip : responsible research and innovation (rri) involves governance processes which de-facto institutionalise varieties of normative positions, involving embedding values into practice (Randles & Laredo 2013).
- Steering innovation towards the things about which people care, (Sayer 2012).
- Centres institutional transformation, via people and capacities (deep rri).
- Responsible Research and Innovation (RRI) involves the design and adoption of RRI Frameworks and Instruments. A more procedural and bureaucratic micro-level approach. (Arguably RRI, as a 'surface' approach has 'surface' *and* less stable outcomes?).

# Horizon 2020 – and RRI

- **A Responsible Research and Innovation 'Approach' cross-cuts the 3 Pillars, emphasising:**
  - *Governing the Process* of developing new and emerging technologies (cross-disciplinary natural sciences and social sciences. New methods and tool-kits involving deliberation with 'public(s)'. (Eg Rene Von Schomberg's 'Framework' for RRI, Von Schomberg 2012, 2013)
  - (portfolios) of antecedent methods such as 'Constructive Technology Assessment (CTA) and (reflexive) anticipatory governance (AG)
  - *Governing the Outputs* : steering science, technology & innovation outputs towards addressing societal challenges . Out-facing. Incentvising the self-organisation of cross-disciplinary teams to address a societal 'problem' rather than a 'discipline' problem.
- Under the new Programme within H2020 : 'Science With and For Society'

# 'Science with and for Society

- 2014/15 Calls came out December 2013 (very new)
- 'Call for **developing governance for the advancement of Responsible Research and Innovation' (GARRI).**
- How to ensure that: 'Outcomes resulting from R&I will correspond to the needs of the various societal actors and be suitable for society in the long run.
- **All societal actors (researchers, citizens, policy makers, business, 3rd sector organisations) must work together during the whole R&I process to align R&I outcomes to the values, needs and expectations of European Society, is termed Responsible Research and Innovation (RRI) .**
- **NB Politics and power plays swept away in these passages….**

# advancement of Responsible Research and Innovation' (GARRI).

- GARRI 1. Fostering RRI Uptake in current research and innovation systems and lower the barriers to implementation of RRI.
  - Take lessons from early warnings
  - Overcome systematic barriers to RRI Approaches (inc lack of recognition in current career system of academic research for RRI/trans-disciplinary approaches.
  - Include RRI in evaluation criteria.
  - A lack of market incentives to internalise external costs of innovation (environmental, societal)
  - Insufficient training of researchers, insufficient professional recognition and uptake of RRI approaches.

    - Research and Innovation Action (100% funding)

# GARRI

- GARRI 2. RRI in Industrial Context
  - Impact: Better uptake of RRI by industrial actors
  - Corporate Social Responsibility (CSR) has set the first steps but improved business governance is needed that deeply embeds creativity, scalability, responsiveness, circularity and societal engagement.
    - Co-ordination & support action
- GARRI 3. RRI in public procurement
    - Co-ordination and Support Action
- GARRI 4. Supporting Structural Change in Research Organisations to promote RRI
  - To encourage modernistation of institutional practices and culture in research institutions, universities and funding agencies to promote RRI.
    - Co-ordination & support action

# GARRI

- GARRI 5. Scientific information in the Digital Age: Text and Data Mining (TDM)
  - Co-ordination & support action
- GARRI 6. Innovative Approach to peer-review (& innovations such as on-line publishing) in research
  - Co-ordination & support action.
- GARRI 7. New research indicators and bibliometrics for dissemination and impacts.
  - By improving existing indicators and developing new ones.
  - Co-ordination & support action

# GARRI

- GARRI 8. Ethics in research : Promoting Integrity
  - Tackling research misconduct
  - Examining the pros and cons of different approaches to addressing research misconduct.
    - Co-ordination & support action
- GARRI 9. Reducing the risk of exporting non-ethical practices to third countries.
  - Addressing the risk of research with ethical implications being done elsewhere…
  - 'Ethics dumping'
    - Co-ordination & support action
- GARRI 10. Responsible Research and Innovation in Higher Education Curricular.
  - The design, production and uptake of educational material and curricular for use of Universities and other higher education establishments and their incorporation into educational programmes
  - The embedding of RRI to shape more responsible and responsive researchers; able to frame their research in the societal context, necessary for tackling societal challenges more effectively and in a more transdisciplinary manner.
    - Co-ordination & support action

# Responsible Research and Innovation 4 'FP7' Projects

- Commissioned February 2013
- 3 year projects, working together
- A significant investment
  - GREAT (socio-normative framework, philosophy)
  - RES-AGorA (research- empirical – towards a 'socio-normative framework of RRI' – but what form?) …… in view of micro-level proliferation of RRI Frameworks?
  - PROGRESS (international network)
  - RESPONIBILITY (observatory)

# RES-AGorA

- RES-AGorA – WP2 – conceptual (multi-disciplinary researchers/teams)
  - RES-AGorA Conceptual architecture centres on: arrangements, actors & practices of RRI .
- RES-AGorA – WP3 – Seeds of rri – (large) empirical work package : (first) taking a body of cases as landscape of different entry points to understand rri. Such as
  - Policy hybrid fora, (eg nano-safety in NL)
  - 'technological controversies', (fracking in Austria and beyond)
  - Value chains (eg standards and participatory guarantee schemes).
  - Individual instruments – how they are received by actors and implemented (eg the EU Nano-Code of Conduct)
  - Countries
  - 'Unhinged'
  - Organisations – The 'Good' University,
  - Organisations – Multinationals & Corporate Social Responsibility (CSR)
  - Innovation 'systems' and how they transform when new normative criteria are introduced (Biofuels in Brazil and USA),
  - The Institutionalisation of responsible innovation : '100 Voices' and socio-semantic maps of responsible innovation (CorText/IFRIS) …. Institutional Entrepreneurs….
    - Currently we are writing-up 10 RES-AGorA pilots, extracting lessons learnt and iterating to further develop the conceptual framework (framing of 'effectiveness' and 'legitimacy')
    - WP5 – Country correspondents 8 partners, 8 Euro periphery
    - WP4 – one year of workshops with stakeholders and dissemination.

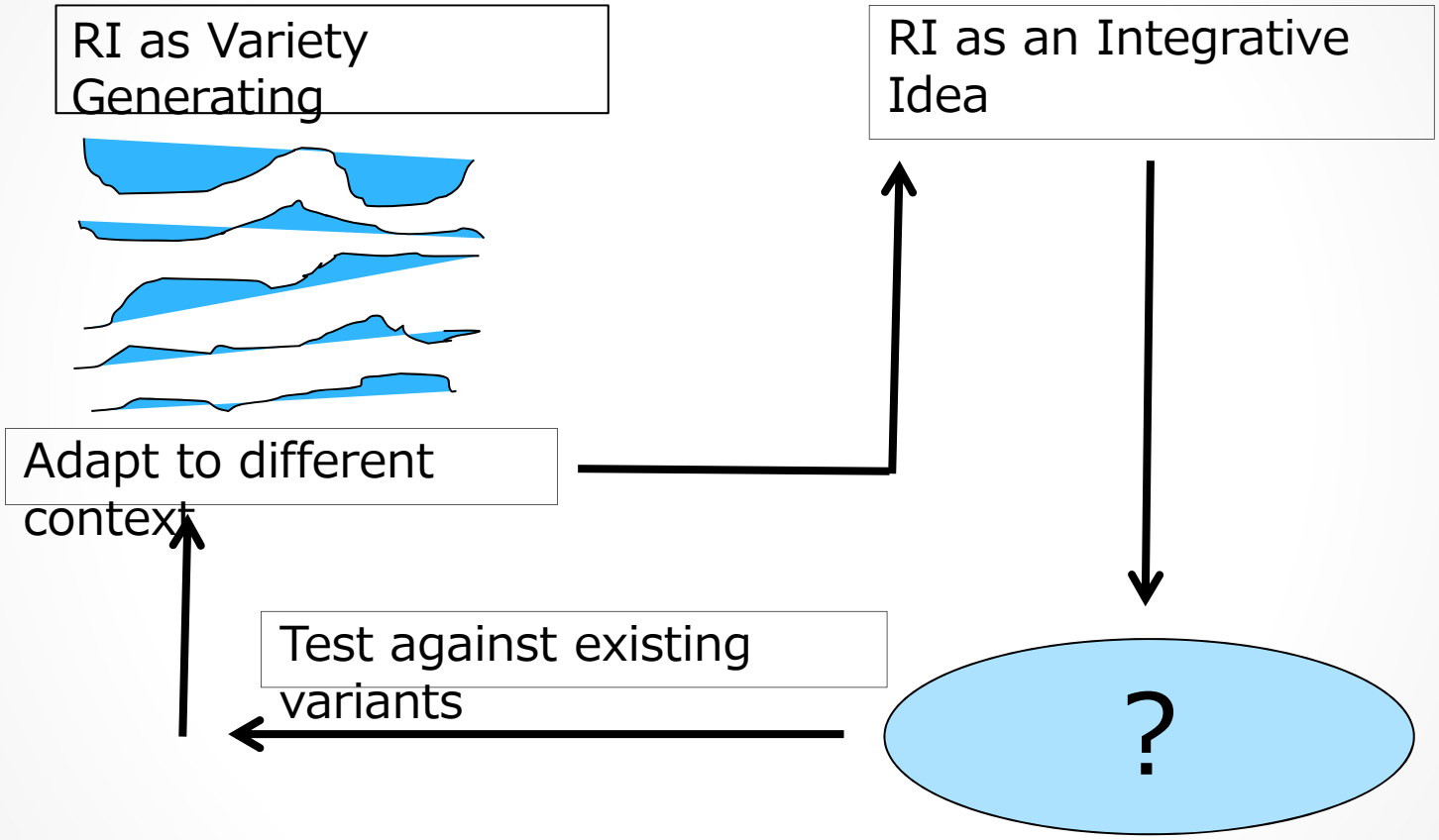
# what do we see on the ground by way of initiatives

- Why?
- 1) ***To know what is out there already!*** If FP7s are asked to offer new Frameworks – these will need to acknowledge, sit within, and relate to the existing/emerging landscape of rri (*de-facto* governance )/RRI (proliferation of new frameworks). Q what ***kind*** of new EU framework/guidelines are most appropriate to add to what exists already & emerging in the pipeline?
- ***2 Policy questions*** : a) Compatibility of emerging proliferation with H2020 aspirations?.. b) Is the 'performativity' of RI a 'success' in terms of EU ERA policy & H2020? – *very provisional answer 'yes in terms of uptake and circulation of the 'idea' of responsible innovation , 'yes' in terms of proliferation of initiatives debating and reflecting on it 'Yes' in terms of proactive development of RRI frameworks, 'cant say yet' in terms of*
  - *agencement (Callon 2007) (transforming agents – person+devices (inc governance instruments) = functional division of labour (scientist, technologist, engineer, entrepreneur, industrialist, producer, consumer) +normativity/values & citizenship/public good 'responsibilities';*
  - *'deep' embedding into practice, or*
  - *affective power (making a difference)…..*

# *A proliferation of micro-level activities*

- 1) A proliferation of initiatives (conferences, meetings, debating platforms, 2 journals 2 books+ & governance Frameworks for Responsible Research and Innovation) **(RRI), with associated instruments, protocols, devices** … producing a landscape of variety contoured by
  - *a) different normative underpinnings (varieties of 'good')*
  - *b) different framings of the problem/deficit/insufficiency positing RRI as 'solution' (and vice versa RRI posited as solution frames the problem as one of a 'Responsibility deficit' – otherwise why do it??? ( revisit this question later wrt CSR)*
  - *c) different contexts of origination/purpose and application (eg cf Owen and Stilgoe, Rene Von Schomberg, Raynor and Pidgeon's 'Oxford Principles' focus on science and research practice; Roco/PCAST on responsible commercialisation)*
  - **Much activity around the micro-level negotiation and production of initiatives and instruments……**
  - **does (scholarly/STS) attention focussed on these *micro-negotiations* distract from more structural accounts of RRI (Joly 2013 forthcoming). So far an absence of social theory taking RRI as an object of study .(Guston 2013). eg Randles & Laredo 2013 offer building blocks of an *institutionalist sociology* of responsible innovation.**

# *integrating idea & RI as variety generation*



# The Formation of Scientist Citizens & Empowering

# Citizen Participation in S&T Devpt

| Rationale/deficit | RRI 'Solution' | Architects | Clusters/types? & H2020 |
|---|---|---|---|
| Intervene before decisions lock-in, Loss of trust in Sci and Scientists (Beck 1995) Nest uncertainties, Democratic deficit, distributed governance of S&T | (Upstream) public deliberation, Incorporate lay knowledge<br><br>Involvement of social scientists<br>-Anticipation | From Brian Wynne's sheep(1996)<br>Richard Owen,Jack Stilgoe Jack Wilsden, Phil Mcnaughton,<br>UK Technology Strategy Board (Applied to UK Research Council calls eg Syn Bio) | H2020 Pillar 1 – Scientific discovery<br>Scientist-citizen, |
| Intervene too early/too late | (Midstream) modulation | Erik Fisher, ASU (2006) | |
| Users perspective | (Downstream) user and other market-facing stakeholders in deliberation | Callon (2011) | |
| Science outreach and communication | Empowering science literate, reflexive society | USA (ASU Exemplary) | Empowering citizens to engage with science |
| Scientists formation | Ethical and socially conscious engineer<br>Values sensitive design of new technologies<br>Specialism: Energy Infrastructures | TU Delft,<br>Prof Jeroen Van Den Hoven, Dept Values and Technology<br>5 conferences on ri (from 2011) | Scientist-Citizen |
| Unreflexive scientists counter 'Science Republic' (Polanyi 1962) | Public Engagement in the Scientific Enterprise | Many | |
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# Academic Contributions….

| Rationale/Deficit | RRI 'Solution' | Architects | Cluster/Types & H2020 |
|---|---|---|---|
| Absence of Comprehensive Tech Assessment with Societal Reflection Legacy : ELSA, EHS+Risk Constructive TA (Rip) and Anticipatory Governance (eg Kearnes & Rip 2009, Guston 2008 jumbo shrimp) | Frameworks for RI- Anticipation, Reflexivity, Inclusion, Responsiveness (Geo-Eng)<br><br>Oxford Principles (Trans-Atlantic Select Committees on Geo-Eng)<br><br>RI Matrix, Products and Processes | Richard Owen , Jack Stilgoe & Phil Macnaghton (2013) & book (Responsible Innovation: Managing the responsible emergence of science and innovation in society (2013)<br>Steve Raynor & Nick Pidgeon<br><br>Rene Von Schomberg (2011, 2013) | Scientist-Citizen Multiple Stakeholders (Hybrid For a) |
| | Community | Grunwald (2011) at TU Delft Conference (2011) | Scholarly Community |
| | Virtual Network 'VIRI', NSF | Guston et al (2013), inc theoretical idea of 'SIM' | Scholarly Community |
| Collective State of the Art in RI | Journal of Responsible Innovation | Guston et al (2014) | Scholarly Community |
| Debating Innovation & Responsibility inc 'Irresponsible Innovation' in Financial Services, ICT, Construction | Journal : Debating Innovation<br>Web-Observatory of Responsible Innovation | Callon et al (2011, 2012, 2013) French Sociologists School | Scholarly Community |
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# Commercialisation & Policy

| Rationale/Deficit | RRI Solution | Architects | Cluster/Types |
|---|---|---|---|
| 'Fair' Commercialisation & IP protection. Univ Tech-Transfer & spin-outs | University-based Centre for Responsible Innovation | Guston Centre for RI (2004) | USA 'Just' Commercialisation<br>H2020 Pillar 2 Commercialisation of New and Emerging Techs |
| RI as Economic Devpt, home-nation skills and jobs | (USA) National Policy (NNI/CNS) on Governance and Commercialisation of Nano | M. Roco et al ( 2001 - 2011)<br>USA National Nanotech Initiative PCAST (2011) | Policy Entrepreneurs influencing National Policy |
| Demonstrations of RI | Awards proposed, Empirical 'bottom-up' articulation of RI by practitioners' | Guston et al, Bassetti Foundation (Jonny Hankins) | Academic/Private Foundation |
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# RI as the (competitive) Corporate-Citizen: CSR,

# Moral Entrepreneurs & take-up by Industrial Fora

| Rationale/Deficit | RRI 'Solution' | Architects | Cluster/Types |
|---|---|---|---|
| Values-driven corporate activity (origins of CSR 19th Century Philanthropy, developed as a management science 'discipline' 1970s) | CSR | BSI ISO 26000 Standard on Social Responsibility<br><br>(See Campbell 2010 on Institutionalisation of CSR ) | Building and Protecting Corporate Reputation in Global Markets, Discriminating values-driven corporations??<br>…Self-Regulation<br><br>H2020 Pillar 2 |
| Beacons of Moral Entrepreneur and Values-Driven Corporatism | Knowledge Hub on RI – Visionary/Beacons. Intermediaries of RI | Bassetti Foundation (Moral Entrepreneur and Philosopher Giannio Bassetti), Jonny Hankins (Book Handbook of RI) Hilary Sutcliffe (2011) | Entrepreneur-Citizen |
| (Chemical) Industry 'Disasters'. Central Role of Chemicals in materials and products. New materials & technologies (Nano) | Responsible Care (EHS, Value Chain Transparency & Life – Cycle Envt Impact Assessments)<br>Awards for Responsible Care (EHS processes and systems 'good practice') | Responsible Care launched by Canadian Chemical Producers Assn (1985)<br>Global Charter for Responsible Care +UN (2006)<br>International Council for Chemical Assns (60 national Assns)<br>Individual Corporates eg BASF | Industrial Associations For a discussing and operationalising RI |
| R&D Industrial Managers | FP7 on RRI in industrial context bringing tog industry and NGOs triggers conference debate | EIRMA, European Research Management Assn (2013) Task Force on Responsible Innovation | Industrial Associations For a discussing and operationalising RI |
| Place-Marketing & Regional 'industrial Cluster strategy' | Responsible Regions as basis for regional cluster strategy | Universal Green Optimum (NGO) Forli Regional Chamber of Commerce, Italy. o<br>(10 companies certified, 28 International 3rd party | 'bottom-up' RI?<br>Suggests new 'Markets for Standards promoted by certifiers' |

# Less developed (policy) discourses & actor engagement: Societal Grand Challenges; RI & Sustainable Dvpt; RI & Social Innovation & 'Grass-roots' RI

| | | Architects | Cluster/Types |
|---|---|---|---|
| Societal Grand Challenge 'problems' require multi-disciplinary solutions | Organisation and Co-ordination responses,<br><br>Needs articulation of RI & SGC<br>Needs articulation of RI & SD | EU Policy Reports of Expert Groups & ERA (Georghiou et al)<br>See also De Saille (2013) for challenges of ERA/RRI | Policy Aspiration?<br><br>H2020 Pillar 3 Citizenship<br>H2020 integrating all 3 Pillars into co-ordination for Grand Challenges |
| Social Innovation as response/resistences to global markets and grass-roots responses to societal challenges (Food, Climate Change, Envt, Design of Technologies | Needs articulation RI & SI Adv Manufact eg Fab-Labs. Etc… | FP7 calls (2012) & H2020 workprogramme,<br><br>BEPA (2010) | Social Innovation & H2020 Pillar 3 – contribution of SI as economic actors, citizenship & welfare, scaling-up grass-roots initiatives? |
| Political Controversies & grass roots activism | RI techniques and philosophy as 'mediation' | UK ESRC website on the Fracking controversy (Aug 2013) | Use/Miss-use of legitimate intervention by RRI Practitioners? |
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# theoretical at the meso-level

- Towards an
  - *Institutionalist Sociology of Responsible Innovation….*
- Taking Responsible Innovation as an *'object'* of research and study.
- Generic framework of (5) Building blocks:
- Responsible innovation as:
- Historically contingent
- Institutionalising a plurality and contestation of normative positions
- Putting 'I' into responsible innovation
- Governance transformations.
- People and capacities– the role of institutional entrepreneurs