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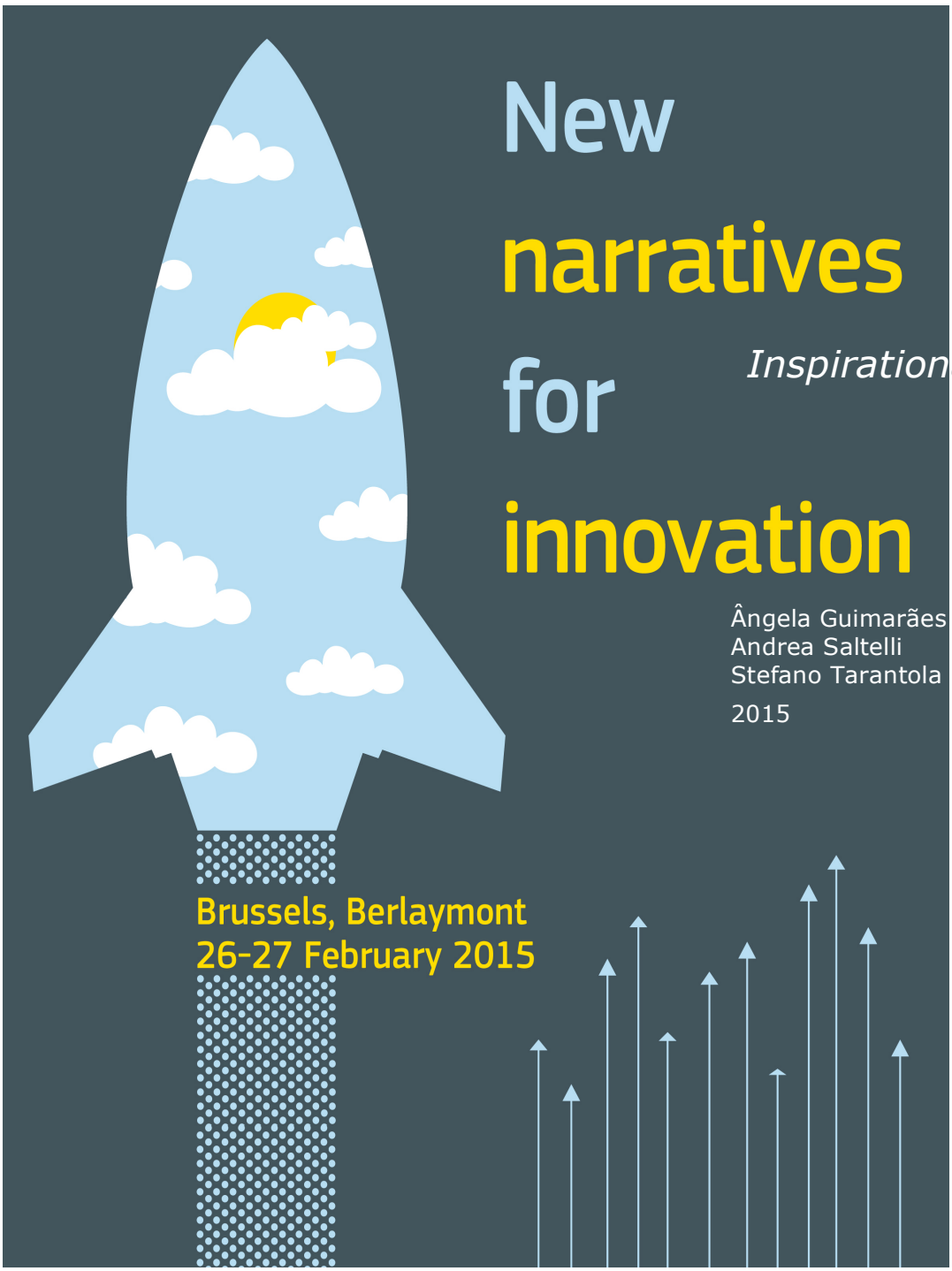

Inspirational Workshop 1

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Joint Research Centre

New Narratives for Innovation

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"The European Commission entrusts an important role to innovation in order to assist in the exit from the present recession and alleviate the labour market predicaments of several Member States. This salvific role of innovation is under increasing pressure from different strands of academic thought, with questions such as:

- *Can we improve the way we foresee our technological future?*
- *Can we re-think the definition and role of innovation and what innovation is desirable to alleviate present social strains?*
- *Can we produce more democratic and sustainable imaginations of the technological trajectories we want to pursue?*

The workshop is an attempt to establish a dialogue between selected scholars and interested EC actors of research and innovation policy, the aim being to test new narratives in the policy discourse.
There are at present several different narratives with a story to say on innovation. Among these, the workshop focuses on those originating from three strands of scholarship:

- *Economics*
- *Science and Technology Studies*
- *Bioeconomics*

In confronting the prevailing innovation-for-growth narratives with different legitimate alternative stories the workshop will look at the virtues of the free market and competition, at the tension between man and machine, and at the effects of biophysical constraints on economic growth[1]*."*

Preamble of the workshop on New Narratives of Innovation held in Brussels on 26-27 February 2015.

[1] Saltelli & Dragomirescu-Gaina, 2014.

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Summary[2]

The Workshop

The DG JRC organised in 26-27 February 2015 a workshop[3], mostly targeted at European Commission's colleagues, which invited to reconsider some of the prevailing narratives on innovation. The initiative originated from a brief published by the DG JRC in 2014[4]. This is the first of a series of what we subsequently called "Inspirational Workshops" that aim at reflecting on the quality of narratives and tools that underpin current policy making.

The event was opened by **Vladimir Šucha**, Director General of DG JRC:

> *"For me this is unusual but it should become regular. We should have a platform where we ask ourselves but also people from external bodies to challenge what is taken for granted. To talk about innovation but not innovate about innovation is not innovation. If we talk for years about the same mantra, which is extremely linear, this is not innovation."*

Hence, through a series of talks, the invited speakers challenged the concept that hegemonic narratives of innovation could apply to a context that includes 28 countries with different histories, trajectories and expectations. The workshop noted that the persistence of some concepts (sometimes just as rhetorical strategies) is a subject of science and technology studies that dissect the usefulness of such persistent concepts. **The study of these terms - some voided of significance, others heavily charged with imaginaries and normative ideas about how humans should live their lives - is urgent in order to ensure the credibility of the narratives that sustain the European project. This task cannot be left to scholars alone but should involve all societal actors in purposeful organized dialogue about the scrutiny of such imaginaries and the narratives that sustain them**.

Furthermore, the talks pointed out main issues that deserve reflection and action, namely:

(1) **Escaping normalisation**, as diversity is the cornerstone of creativity, which is in jeopardy through processes of standardisation, normalisation and harmonisation. For example Education systems should guard diversity by keeping alternative cultures alive;
(2) **Escaping reductionism**, as the 'field' of innovation is full of simplifiers in matters of everyday life, from health, food, energy, communication, etc. in the form of irrelevant indicators or inappropriately use of risk to frame complex problems;

[2] N.B. this report develops an extended summary sent to DG Vladimír Šucha and to the Heads of Units A1 and A6, in the end of March 2015.
[3] See https://ec.europa.eu/jrc/en/event/workshop/new-narratives-innovation.
[4] http://technologygovernance.eu/files/main/2014082708083838.pdf

(3) **Encouraging ethics of care**, as innovation that cares is a step forward on the fight against present social inequalities;
(4) **Participating to the process of change**, following the ongoing movements that have changed the place of science and technology in society, notably, Open Science and "Do It Yourself Science".

The reaction to the speakers came from colleagues of the European Commission and were opened by **Keith Sequeira**, DG RTD:

> *"I must say it is the first time that I have been to an event of this type where the explicit purpose is to challenge some of our policy thinking, to test its robustness, and explicitly try to get some of the people like myself to listen to ideas that might not fit with the particular narrative that we re trying to sell as policy narrative and there is some appreciation from the panel for organising this. It is not always a comfortable thing to do, but we have to be open and acknowledge those weaknesses on our policy arguments."*

In spite of the positive commentary to the workshop, it was clear to us (organisers) that colleagues in DGs do not have the material time to engage with the reflexive exercise proposed through this "out of the ordinary" gathering. **Therefore we consider that there is an opportunity for the JRC to fill in on much needed innovation about how we think and do policy making at the Commission**.

Continuing this Dialogue

The JRC has far stronger networks with the academic world than any of the services in Brussels; thus **JRC is in a position to foster and make regular these kinds of conversations**. This can be seen as another type of support from the JRC to the services, organisation of "*inspirational workshops* about the narratives we live by". Some of the attendees suggested urgent themes to be dealt with:

(1) **Innovation, Competitiveness and Fairness** (the latter is an *orphan* issue in President Juncker's agenda for the European Commission);
(2) **Innovation, Inequality and Growth** – is growth likely to accrue only to the elites in the present paradigm?
(3) **Trust: Citizens' disenchantment and disengagement with the European project**. The lesson of history on the persisting crisis.

We recommend that in order for these conversations to take place, they be tailored for the interest of the services, adapting a shorter time formulae. **Thus the JRC could continue to deliver inspirational workshops like 'New Narratives for Innovation' while at the same time deploying a concise summary of those seminars as "lunch talks" to be done at the premises of the interested service.**

In addition, we recommend that the JRC could also **maintain and consolidate in-house the expertise in science and technology studies**. Innovating about how we

think about innovation or any other slippery concept calls for in-house reflexivity through workshops and beyond. Staff with competences in science and technology studies can stir these discussions and studies within existing projects with other services of the Commission. Through an “engagement hub” a space to foster inter- and trans-disciplinary approaches to the policy issues that afflict our society and planet in general can help with maintaining the necessary dialogues with civil society on contested themes, helping with improving the quality of the narratives we live by.

Reflections

> "For me this is unusual but it should become regular. We should have a platform where we ask ourselves but also people from external bodies to challenge what is taken for granted. To talk about innovation but not innovate about innovation is not innovation. If we talk for years about the same mantra, which is extremely linear, this is not innovation. (…) If we are serious about innovation, we have to be able to challenge these things even if they had been working for sometime and under some conditions which cannot be generalised. (…) We need to look beyond explicit societal challenges; we should be looking also into what I call implicit challenges such as citizen fatigue and disengagement with the European project. " *Vladimir Šucha, D.G. DG JRC 26/02/2015 @ 2PM*

Introduction

The following set of reflections is based on the talks of the keynote speakers.

At the workshop, **Andrea Saltelli** recalled the present crisis in science's governance, whereby several scholars infer that as much as 85% of all research funding might be wasted simply by science's non reproducibility, a crisis plaguing all endeavours of scientific enterprise. When this crisis is compounded with parallel crises of legitimacy, distrust in the European project, of fairness and inequality, the innovation narratives appear in urgent need of a political and institutional revision.

Current narratives that sustain innovation are suffering from different types of disconnect. For their promises, impacts and the actual processes seem to assume hegemony of social, political and cultural, in a context that includes 28 countries with different histories, as well as different relationships with the present and the future. Moreover, the persistence of both the deficit and the positivist models is facilitating unfairness, inequalities at different scales, distrust on the European project and the institutions that sustain it, as well as outright societal breakdown, making the innovation narratives look like fairy tales.

At the workshop, **Mario Giampietro** looked at innovation through the lenses of quantitative bio-economics and showed how "hypocognition" as described by Lakoff in 2004, i.e. dramatic simplifications of available readings of the state of affairs and its possible explanations, is prevailing on the current narratives of innovation, resulting on epistemic and ethical reductionisms - e.g. as when biofuels are portrayed to solve energy problems, GMO's to feed a starved world, etc.

"Hypocognition" as described by Lakoff in 2004, i.e. dramatic simplifications of available readings of the state of affairs and its possible explanations, is prevailing on the current narratives of innovation in the form of epistemic and ethical reductionisms. Some of the most notable examples come from the fields of Energy and Information Technologies. On the other hand, the narratives of innovation also suffer from "hypercognition", as innovation (focused on technological creations and innovations) is presented in a salvific role to cure current societal crisis arising from prevailing paradigms and centuries old thoughts such as the Cartesian dream of predictability and control of humans over Nature.

Silvio Funtowicz discussed the impossibility to continue subscribing to positivistic narratives of separation (demarcation) between science, policy, and values. The modern state's principle of double legitimacy, with science guaranteeing legitimate facts and policy offering legitimate values, is thus in profound crisis.

With modernity, science has been offered as the legitimate and epistemic cure for some societal heals; uncertainties could be tamed because science was to provide value free, objective and neutral *facts* whereas *values* were relinquished to the political sphere ensuring through such reductionism a swift way out of the complexity that characterises so many human affairs. At the EU, today science seems to be offered as the unifying element of diversity in the EU (see for example the report with the title "The Future of Europe is Science"), it being also the underpinning of innovation narratives; yet science is at the basis of many of our current predicaments, attempting to cure the wrongs that scientific knowledge has generated with other science. The changing nature of the scientific enterprise from a curiosity endeavour into an industrialised one has led it into a crisis of trust, legitimacy, authority and credibility due to changes in its fabrics that can no longer rely on received ways of quality assurance. The Internet has accelerated those processes but it is also fostering new loci of knowledge production and new ways to ensure its integrity (knowledge assessment). Hence, quality assurance of the processes that sustain innovation are being challenged, which in itself is a much needed conversation.

At the workshop, **Roger Strand** started by questioning the framing of the questions in the conference programme:

> *- Can **we** improve the way **we** foresee our technological future?*
> *- Can **we** re-think the definition and role of innovation and what innovation is desirable to alleviate present social strains?*
> *- Can **we** produce more democratic and sustainable imaginations of the technological trajectories we want to pursue?*

He asked who is the "we" in this set of questions, and who should be taking part of this dialogue. Strand explained what socio-technical imaginaries mean in the practice of Commission policy making. As an example he referred to a Commission's research call that imagines that human support to elders is replaceable by robots, and that thus implicitly to care is a tradable commodity. He argued that in cases like this it is useful to reflect about the consequences of the narratives we are subscribing to. Who are really the **"we"** enacting these socio-technical imaginaries?

Hence, the very questions with which we (as JRC) have set off with at the workshop as described above assume that "we" know who the "we" are; who is the "we" in this set of questions drafted by the JRC? Who should be taking part of this dialogue focusing on re-imagining narratives of innovation? We (the organisers of the workshop) believe that the "we" that improves, foresees, re-thinks, imagines and

has the agency to decide what WE (collectively) want, wonder, need and can calls for an urgent democratic turn – a key point in President Juncker's Plan.

At the workshop, **Alice Benessia** discussed how innovation imaginaries are produced to resolve problems created by innovation itself, via optimization, substitution and imagination of the silver bullets.

Hence, this workshop – as an embryonic effort to embrace the needed dialogue – set on stepping back and engaging on a constructive talk about the reasons why current narratives of innovation are not working; this included the broader assumptions that are made with that proposal to get Europe out of different crises, entertaining questions such as, *what do we want to innovate*, *how do we want to innovate* escaping the linear thinking altogether, rather concentrating on the innovation nexus in the emerging social and political context.

At the workshop, **Erik Reinert** and **Ting Li** discussed the relationship between innovation and diversity; **Reinert** appealing to the Schumpeterian - Sombardian – Listian school of economic thought, criticised the narrative of market as a solution to all problems, including those of innovation. **Li**, looked at the evolution of innovation in China following the pendulum of centralisation – decentralisation throughout different dynasties. For **Reinert** current narratives of innovation are full of "slippery concepts"; for example, what does competitiveness mean? - The OECD changed the definition though the years to better fit a neoliberal agenda. What does productivity really tell about an economic system?

By asking these questions, the workshop examined key assumptions and slippery concepts that sustain current innovation narratives and suggested that we need better

At the workshop, **Joseph Tainter** critically looked at the prevailing salvific role attributed to innovation by showing via a quantitative analysis innovation's diminishing pace and its decreasing return.

Finally, the questions we are asking may not necessarily the most relevant ones. Not all actors that are driving processes of societal change have been involved on the taming of current disconnects and crises; innovation may not even be the right descriptor for the changes needed to respond to challenges posed by past and prevailing policy and political choices. As in the famous Mullah Nasruddin's lamppost story, there might be the need to cast light in spaces where we currently are not looking at to find alternative narratives that respond to our current predicaments.

Preliminary Identification of "Significants"

Things on which we need to cast light if they are to be useful.

Putting meaning on 'significants':

E. Reinhert

Current narratives of innovation are full of "slippery concepts"; for example, what does ***competitiveness*** mean? The OECD definitions have been changing overtime reflecting different economic schools; what does ***productivity*** really tell about an economic system? This concept is not useful, e.g., to understand the poverty of countries as it does not translate into income; what is the relationship between productivity and quality? – The Baumol's law; *innovation research* is the current fit in the dominant narrative of modern science; is ***innovation*** always possible or desirable or useful? Innovation opportunities depend on the economic activity and are determined by contextual issues (e.g. resource unavailability; impossible mechanisation, etc.). What is meant by "inclusive" in ***inclusive*** growth? How do we operationalize the inclusive in growth? Innovation creates ***jobs***? It should be clear by now that what has been selling as initiatives that create jobs, are not creating more jobs than the ones that they take away – the IT industry is a flagrant case of this tale. The choice of the *significants* frame the windows that will be open on policy and investments.

> *"Although free market fundamentalism has been relegated to the dustbin of history, the second pillar of neoliberalism – free trade – is not only still standing but has been reaffirmed as indispensable by political and economic elites around the world* (Steger & Roy 2010)"

M. Giampietro

Current narratives of innovation also perpetuate some myths, *granfalloons* and let some fairy tales thrive at length unquestioned (e.g. biofuels to solve our energy problems, GMO's to feed a starved world, etc.). These types of strategies are most of the times (expensive) distractions to circumvent current unfairness by means of (expensive) techno-scientific fixes to deal with what otherwise are problems of social justice, which would require unpleasant conversations.

The persistence of some concepts (sometimes just as rhetorical strategies) is a subject of science and technology studies that dissect the usefulness of such persistent concepts. The study of these terms some voided of significance, others heavily charged with imaginaries and normative ideas about how humans should live their lives is urgent in order to ensure the credibility of the narratives that sustain the European project. This task cannot be relinquished only to scholars but to all societal actors in purposeful organized dialogue about the scrutiny of such imaginaries and the narratives that sustain it.

Escaping normalisation

E. Reinhert

Great stories of innovative artefacts and concepts arise as response to diverse demands and supply (e.g. lenses required at the same time by industry, arts and science). Ensuring **diversity** is the cornerstone of creativity, which is in jeopardy through reductionist processes of standardisation, normalisation and harmonisation. Education systems should also guard diversity for example, by keeping alternative theories alive.

> "what made Europe great was diversity and competition" Sombart (1913).
> "diversity is a source of freedom" Wolff (1723)

M. Giampietro

Reductionism

Encouraging *hypocognition*, i.e. using simplifiers to describe highly complex societal from health, food, energy, communication, etc. in the form of irrelevant indicators or risk framings. The offering of simple models that propose simple numbers lacking external referents are likely to under-represent the complexity of the questions that matter to the EU citizens. Encouraging *hypercognition*, i.e. developing just another blueprint, such as innovation to address our ills, is a recipe for disaster. Instead, fostering learning and empowering processes that take stock of diversity *viz à viz* the context of current changes allows tailored rethinking of needed changes ahead.

Ethics of care

A key distinction between the financial economy and the bio-economy is on conceptions of care. In financial economy the actors do not establish care relationships with others; bio-economy as it existed was about **caring** about others, the land and ecosystems. **Encouraging innovations that care is a step forward on the fight against many of the ills that afflict our world responding concretely to the quest for responsibility and social justice.**

Changing context

There are ongoing movements that have changed the place of science and technology in society and that we need to take stock of when we talk about Innovation. They are changing the ways in which creativity and Innovation are pursued on the one hand, and how the assessment and governance of knowledge are pursued, on the other hand. Notably, **Open Science** (and in general the "open everything paradigm") aims at making science accessible but also at extending peer review systems; "**Do It Yourself Science**", is grassroots scientific knowledge production, (DIY biology is an example), an emerging business model that competes with the entrepreneurial science mode.

Comments, Reflections and Implications for Policy

By invited colleagues from the European Commission

> "I must say it is the first time that I have been to an event of this type where the explicit purpose is to challenge some of our policy thinking, to test its robustness, and explicitly try to get some of the people like myself to listen to ideas that might not fit with the particular narrative that we re trying to sell as policy narrative and there is some appreciation from the panel for organising this. It is not always a comfortable thing to do, but we have to be open and acknowledge those weaknesses on our policy arguments." *Keith Sequeira, DG RTD 27/02/2015 @ 4PM – workshop New Narratives of Innovation*

This session was chaired by **Keith Sequeira**, Vice Head of 'Analysis and monitoring of national research policies', Directorate-General for Research and Innovation, European Commission and included commentary from selected representatives from policy Directorate-Generals

DG EAC: Julie Sainz, Unit B3

Sainz has pointed out that the direction taken by innovation depends on the training of researchers; inter-disciplinary research and development of types of skills that make citizens more adaptable to the jobs market. On the other hand, excellence should not only be focused on scientific quality but also on the understanding of ethics of what is being developed. The current RRI framework encourages a more ethically and more responsible approach to innovation, requesting critical thinking, improved communication and collaborations.

DG ENER: Mark Van Stiphout, Unit C2

Van Stiphout points out that there are many issues in the energy sector, such as inequality that need to be addressed prior to Impact Assessment. The given link for energy policy has been sustainability, but currently the narrative is focused on growth and jobs; he sustains that a thorough reflection on what growth and what jobs are we sustaining with the emerging energy markets needs to take place. The number of jobs created versus the ones destroyed need to be looked at; for only with a full picture one can grasp what innovation is doing.

DG GROW: Francisco Caballero Sanz, Chief Economist

Caballero Sanz notes that the problems we have to tackle are not complicated but have not been addressed appropriately. He takes the issue of diversity to illustrate that if diversity is financed by the state, it will no longer be diversity as state financing means perpetuation lines of research, determining innovation. He also points out that the Commission itself suffers from lack of diversity and that the JRC as a service that scrutinises the predominant narratives by which other services operate constitutes a rare asset.

DG ECFIN: Isabel Grilo, Head of Unit B2

Grilo believes that innovation is still a driver of growth but the issue of inequalities needs attention. She suggests that innovation creates losers and winners and believing that is not so, is a fairy tale.

DG EMPL: Isabelle Engsted-Maquet, Deputy Head of Unit B4
Engsted-Maquet raised a serious of questions, namely she argues that a meaning for quality of life is currently lacking, beyond fast connections and longer lives. She argues that distributional issues of the benefits of innovation need to be addressed and in particular how society participates in the process, not only through jobs and consumption.

We remark that, in spite of the positive commentary to the workshop by those who participated in it, it was clear to us that colleagues in DGs do not have the material time to engage with the reflexive exercise proposed through this "out of the ordinary" gathering. **We see an opportunity for the DG JRC to fill in on much needed innovation about how we think and do policy making at the Commission.**

Recommendations

The discussions at this workshop indicated that there is a sort of unspoken *agreement* that the ways in which institutions like ours propose and develop policy making are in need of change. In particular, the following elements may help with needed Action.

Constructive scepticism. Encouraging activities that allow a culture of constructive scepticism about mainstream narratives can only be beneficial for EU institutions and citizenry. Challenging does not mean to throw away existing concepts and ideas; challenging is about having conversations that review established mainstream ideas, in order to see if they are still useful for the context in which they are being applied. "Creativity is about disruption challenging the petrified way of thinking".

Holistic approaches. Life consequences of several innovation trajectories cannot be reduced to risks, not least because most of the times they cannot be calculated or the numbers crafted are totally irrelevant; questions about values and normative issues implemented through technology need to be veiled as they relate to specific imaginaries of how human life should be lived. Hence, by questioning the narratives of innovation we are endorsing and in which we are putting a great deal of public resources, we will also be holistically interrogating the taken for granted imaginaries of science and technology.

Put appropriate resources on dialogue. Resolving the demographic deficit in the conception of imaginaries of technology encompasses genuine spaces for dialogue. Starting from what exists in the house, expert groups need to have an equal influential voice from civil society; putting an end on 'rubber stamp' consultations is a condition *sine qua non* to the processes that trigger fatigue and disengagement.

Tabula rasa. Take stock of existing in-house practice: the European Commission is not a *tabula rasa* on fostering socially robustness of science and technology. It is now more than a decade that DG RTD through the Framework Programs of Research maintains a research agenda on science /society relationships; their most recent lemma is responsive to perceived challenges that current innovation processes are generating: "Responsible Research & Innovation" (now turned into the Rome Declaration[5]). These lemmas can be materialised across all services in this institution but the JRC needs to consolidate existing scientific competency to implement the "responsibility" talk across all its activities of scientific advice to policy. The RRI precludes ***better alignment*** of research agendas and citizens and civil society's concerns and expectations: *not any kind of innovation but one that is acceptable, socially desirable and sustainable.*

Interdisciplinarity. The reflexive work needed needs to be at least initiated by those who are trained to be reflexive. The role of social scientists and in particular of those

[5] Available at http://ec.europa.eu/research/swafs/pdf/rome_declaration_RRI_final_21_November.pdf

that study science and technology need to be part of the teams; critically looking at current techno-scientific narratives and imaginaries is the way forward to contribute to enhance the quality of policy making.

Recognising Agency. The realisation by DG RTD and other research funding agencies that what research calls are funding inherently embed and perform technoscientific imaginaries (i.e. visions of good and attainable future science, technology and society), enacting specific futures. This strong agency needs to be recognised as It implies deep institutional responsibility about societal futures.

At the JRC

At the JRC we should be securing the safe space for **regular** conversations about taken for granted narratives. In practical terms this means that the JRC should organise and invite other services into several "what if" thematic (inspirational) workshops, inviting the two sides of the coin in urgent matters such as inequalities, and all credos that are emerging as cures for the struggles of Europe and the world.

There are no panaceas or recipes to uninstall long-term practiced practices; such 'inspirational' workshops need to be put in the policy context.

At the JRC we should be securing the safe space of invited and organised citizen engagement on conversations concerning policy relevant science in order to foster the processes of citizen scrutiny of the policies that affect all of us. That is what some scholars have called extended peer review, a key development of post-normal science (Funtowicz & Ravetz 1990) and what lies on what is called social robust science (Gibbons & Nowotny 1999).

At the JRC we should engage more with social sciences and the scholarship that reflexively looks into science and technology developments in order to not provide just numbers, models and data but to reflect on the normative ideas behind them, the deeper implications of those numbers at a societal level and above all about the questions those numbers and models are actually responding to. Innovation should be crafted on societal needs and not in specific elite's needs.

Suggestion of Follow-up Actions

Hence, in our quest for quality at the JRC, through furthering inter and trans-disciplinary collaborations prompt us to suggest a set of very practical suggestions in which the JRC could take a serious lead:

1. CONTINUE THIS DIALOGUE
The JRC has far stronger networks with the academic world than any of the services in Brussels; the JRC is in a great position to foster and make regular the kinds of needed conversations that we have sustained with this workshop. This can be seen as another type of support from the JRC to the services, organisation of "**inspirational workshops**" about the narratives we live by…

Some of the attendees suggested urgent themes to be dealt with:

(1) Fairness – an issue that is in Juncker's agenda for the European Commission; what is science doing to increase fairness?
(2) Growth – growth is likely to accrue only to the elites in the present paradigm
(3) Competitiveness and quality in a world of diversity
(4) Trust - Citizen disenchantment and disengagement with the European project

In order for these conversations to take place, they need to be tailored for the interest of the services, namely by adapting a shorter time formulae, yet maintaining also events of the size and length of the "New Narratives for Innovation" where more space for debate needs to be secured. In Annex 1 we propose a series of inspirational workshops that look into persistent paths, current affairs and future challenges to address these issues.

2. CONSOLIDATE SOCIAL SCIENCES AT THE JRC
Maintain and consolidate in-house the types of studies (science and technology studies) that were at the basis of workshops like the one this document reports. Innovating about how we think about innovation or any other slippery concept as this one, calls for in-house reflexivity beyond workshops. Staff with competences in science and technology studies should be encouraged to stir these discussions and studies within existing projects, especially when other services of the Commission are involved.

3. CREATE AN "ENGAGEMENT HUB"
In addition to this support, the JRC should put a clear effort with engaging its scientists in dialogues about policy relevant issues with the civil society, contributing to the efforts of democratic governance. This, we suggest, could be done through a virtual and physical space to maintain dialogues with civil society about innovation; we call it "Engagement Hub".

References and Bibliography

Funtowicz, S.O. and Ravetz, J. R., 1991. “A New Scientific Methodology for Global Environmental Issues”, in Costanza, R. (ed.) *Ecological Economics: The Science and Management of Sustainability*: 137–152. New York: Columbia University Press.

Funtowicz, S. O. and Ravetz, J. R., 1992. “Three types of risk assessment and the emergence of postnormal science”, in Krimsky, S. and Golding, D. (eds.), *Social theories of risk*: 251–273. Westport, Connecticut: Greenwood.

Gibbons, M., 1999. “Science's new social contract with society”. *Nature*, *402*, C81-C84.

Gibbons, M., Limoges, C., Nowotny, H., Trow, M., Scott, P. and Schwartzman, S., 1994. *The New Production of Knowledge*. London: Sage.

Lakoff, G., 2004. *Don’t think of an elephant: know your values and frame the debate*. Chelsea Green Publishing. *Lancet*, 2015. Editorial: “Rewarding true inquiry and diligence in research”, *The Lancet*, 385: 2121.

Reinert, E. S., 2008. *How Rich Countries Got Rich . . . and Why Poor Countries Stay Poor*. Public Affairs.

Saltelli, A., and Dragomirescu-Gaina, C., 2014, New Narratives for the European Project, Working Papers in Technology Governance and Economic Dynamics N. 59, The other canon foundation, Norway Tallinn University of Technology, Tallinn, Estonia. Available at: http://technologygovernance.eu/files/main//2014082708083838.pdf [last accessed 19/11/2015]

Appendix 1

Inspirational Workshops

Inspirational workshops 'New Narratives' and related lunch seminars. A new JRC series

Draft for discussion

Andrea Saltelli[6], March 2015[7]

The list which follows describes possible inspirational workshops in the style of the New Narratives for Innovation event (Brussels, February 26-27[8]). For each seminar the following is given:

a) A subject matter with a **very provisional** title
b) A list of potential key speakers
c) A possible follow up lunch seminar condensing the main messages of the workshop for busy officers in the EC services.

Only the first two workshops are already in the pipeline. All others need to be planned **and budgeted for**. Holding the events in a Commission building puts the price tag for each workshop in the range K€10-20 depending from where the experts are coming from and assuming all experts are happy without a cachet.
A strategic possibility would be to make **the entire series** into a cooperation with the Centre for the Study of the Sciences and the Humanities (SVT) - University of Bergen (UIB). The director Matthias Kaiser could be contacted to this effect. Further to this seminar (3) could be co-organized with the Tallinn University of Technology, seminar (4) with Institut de Ciència i Tecnologia Ambientals (ICTA) - Universitat Autonoma de Barcelona (UAB), for (6) the Nuffield College at Oxford would be a good choice, and (7) is clearly with Arizona State University (ASU).

The **STS team at JRC must take the lead** of the series within JRC but other colleagues from the institutes could be identified to help for each event.

[6] Centre for the Study of the Sciences and the Humanities (SVT) - University of Bergen (UIB). **Andrea Saltelli is also an advisor of the JRC.**
[7] This list of workshops was already submitted to the consideration of the Director General of the JRC, Mr. Vladimír Šucha in March 2015.
[8] https://ec.europa.eu/jrc/en/event/workshop/new-narratives-innovation

List of workshops

1) **Subject:** Significant Digits: Responsible use of quantitative information,
   June 9-10, Brussels

Speakers: Jerome Ravetz, Dorothy Dankel, Zora Kovacic, John Kay, Philip Stark, Andrea Saltelli, Jeroen van der Sluijs.

Lunch Seminar for **SEC GEN**

2) **Subject:** Do It Yourself (DIY) Science: Issues of quality
   June 16-17, Ispra

Speakers: Jerome Ravetz, Ana Delgado, Susana Nascimento, Mariachiara Tallacchini, Jack Stilgoe, Dan McQuillan, Sarah Davies, Sjoerd Hardeman…

Lunch Seminar for **DG CONNECT**

3) **Subject:** Fairness and the EU project. An historical perspective.
   New proposed for 2016

Speakers: Erik Reinert, Jan Allen Kregel, James Kenneth Galbraith, …
Lunch Seminar for **DG EMPL, ECFIN, GROWTH** …

4) **Subject:** Energy, sustainability, innovation: Debunking myths and integrating universal global concepts with the local view
   New

Speakers: Mario Giampietro, Vaclav Smil, Jean H. Laherrère, Kozo Mayumi, Charles A. S. Hall, Ugo Bardi, …

Lunch Seminar for **DG ENER**

5) **Subject:** The double legitimacy of the Modern state. Its crisis and possible solutions
   New

Speakers: Matthias Kaiser, Jerry Ravetz, Angela Pereira, Silvio Funtowicz, John P. A. Ioannidis, …

Lunch Seminar for **DG RTD**

6) **Subject:** Growth at times of crisis: Does all go to the top? Identification of effective paths and feasible scenarios to prevent a jobless growth
New proposed for 2016

Speakers: Anthony Atkinson, Thomas Piketty, Daron Acemoğlu …

Lunch Seminar for **DG EMPL, ECFIN, GROWTH** …

7) **Subject:** Hybridisations: Science, Humanities, Arts and Politics to address societal challenges – the case of Climate Change
New proposed for 2016 *(in strong collaboration with Arizona State Univ.)*

Speakers: Cynthia Selin, Deliah Hannah, Frank Raes, Gretchen Gano, Daniel Sarewitz, Ângela Guimarães Pereira…

Lunch Seminar for: **DG CLIMA, RTD, CNECT**

Appendix 2

The Talks

JRC and innovation: ongoing research and new challenges

Vladimír Šucha, Director-General, Directorate-General Joint Research Centre, European Commission

This introduction highlights that we have to think on innovative ways to think about innovation and that the JRC is in a unique position to host such talks.

What if … an introduction to the workshop

Andrea Saltelli[9], Head of Unit, Econometric and Applied Statistics, Directorate-General Joint Research Centre, European Commission

The talk highlighted the present crisis in science's governance, whereby several scholars infer that as much as 85% of all research funding might be wasted simply by science's non reproducibility, a crisis plaguing all endeavours of scientific enterprise. The crisis, which involves today even the academic peer review system, was in fact foreseen by several thinkers already in the seventies (J. Ravetz, J.-F. Lyotard) and is today better understood by historians such as P. Mirowski. If science is seen as part of a linear system from basic to applied research and to innovation and growth, then perhaps policy should take notice of what is going on. This crisis is compounded with parallel crises of legitimacy, distrust in the European project, of fairness and inequality. For all these reasons the existing techno-optimistic innovation narratives appear in urgent need of a political and institutional revision. Is there a solution? Could processes such as open access and citizen science offer an alternative to the existing dysfunctional models? "Is the internet to science what the Gutenberg press was to the church?" This remark from Silvio Funtowicz offers material for reflection.

Innovation from a bio-economics perspective

Mario Giampietro, ICREA Research Professor, Institute of Environmental Science and Technology, Universitat Autonoma de Barcelona, Spain

The presentation addressed four points relevant for a discussion on innovations using practical examples: (i) the clash of reductionism against the complexity of the issue of sustainability implies "hypocognition" – a poor quality of the quantitative analysis used as input for governance – when the tunnel vision generated by formal models and semantically closed indicators generates "socially constructed ignorance"; (ii) many of the narratives about the expected results of technological innovations capable of avoiding planetary boundaries look more and more like fairy tales, rather than wise reflections about the common future of humankind; (iii) an

[9] Andrea Saltelli is since March 2015 with the Centre for the Study of the Sciences and the Humanities (SVT) - University of Bergen (UIB).

analysis of the biophysical roots of the existing crisis suggests that biophysical factors – e.g. peak oil and peak everything else - may explain a decrease in the pace of economic expansion over the world. In face of this crisis, existing economic policies, giving priority to the boosting of the financial sector, may hamper innovations. In fact, the increasing take-over of the financial economy over the biophysical economy is drying the economic resources and the economic opportunities needed to develop technical innovations capable of dealing with the reduced availability of natural resources; (iv) principles developed in theoretical ecology and in complex system theory to study the mechanisms of evolution can be used to flag the existence of two non-equivalent interpretations of the concept of innovation: (i) **emergence** - introducing a new "why", expanding the diversity of behaviours; (ii) **design** - introducing a new "how", increasing efficiency by reducing the diversity of expressions of a given function.

The Economics of Ignorance and Slippery Concepts

Erik Reinert, The Other Canon Foundation, Norway, and Tallinn University of Technology, Estonia

The dominance of neo-classical economic theory has led to the unlearning of important economic mechanisms. One is the key relationship between a nation's economic structure and its carrying capacity in terms of population. This understanding goes back to Italian economists around 1600, and was last expressed by ex-president Herbert Hoover in 1947: 'There is the illusion that the New Germany left after the annexations can be reduced to a pastoral state (i.e. without industry). It cannot be done unless we exterminate or move 25,000,000 people out of it'. This powerful sentence was important in terminating the de-industrialising Morgenthau Plan and creating its opposite: the Marshall Plan re-industrialising Europe.

Presently austerity and the frozen exchange rate – the Euro – help de-industrialise the EU periphery. It is estimated that de-industrialisation following a free trade agreement with Ukraine will lead 10 Million Ukrainians to migrate, mainly to the EU. A flood of migrants also enter Europe from the de-industrialised Arab world, which have experienced massive losses in GDP/capita.

The solutions remain those outlined by Hoover: the excess population from the de-industrialised peripheries can either migrate to the European core, be left to die, or the problem can be solved by re-industrialising the periphery as was Germany in 1947. Simultaneously the discourse is blurred by "slippery concepts" that change meaning completely: in 1992 the OECD defined "competitiveness" as a situation with rising national wages. In 2015 OECD allows for wages to fall to increase "competitiveness".

Loss of Diversity and Decline: Europe, China and the Future of the Global Economy

Ting Xu, Queen's University, Belfast, Ireland

Recent scholarship on global history has criticized the Eurocentric portrait of the long-term backwardness of China. For example, Pomeranz argued that Europe only superceded China in development around 1700. Most modern scholarship agrees to this new interpretation, but many scholars think the date was earlier by a hunded years or less than the date suggested by Pomeranz. The talk discusses why Europe superceded China by looking at the importance of diversity in the cultural sphere and in the institutions that sustain the generation and dissemination of useful knowledge. The talk focuses on the 'golden age' of Chinese economy, treating economic development in Tang (618-907AD)-Song (960-1279AD) China as a single conjuncture in the long run growth of the Chinese empire. Tang-Song emperors presided over most prosperous periods in Chinese history based upon cultural pluralism and multiple cultural, intellectual and business networks for the generation and diffusion of useful knowledge. However, after this golden age, diversity began to decline in China. The loss of diversity is one of the main reasons to explain why China started a process of decline around the year 1600. The study of the rise and decline of diversity in China is important, as it raises several questions: Is Europe losing diversity now? Are Europe and China changing places again, reversing the developments above? What lessons can Europe learn from China? Answers to these question will shed light on a review on Europe's current policy regarding innovation.

Innovation, sustainability and the political economy of science

Silvio Funtowicz, Centre for the Study of Sciences and Humanities, University of Bergen, Norway

The tension in the complex relation between science and democracy has now reached a level of alarm. Recent controversies (for example, climate change in the USA and GMOs in Europe) have shown that the double legitimacy system characteristic of the Modern State is in crisis. This double legitimacy has been intellectually justified by the facts/values duality, enabling a division of labour: science in charge of facts (certain and quantifiable) and politics dealing with values (uncertain and capricious). Previous tensions (major accident hazards, mad cow disease, etc.) have resulted in calls to a more radical separation between the two realms (scientific assessment and political management) and improved education in order to reduce the science-knowledge deficit. This strategy is increasingly ineffective given the content and aspirations of technoscience and innovation research on one hand, and the desperate need of political institutions on the other, to manufacture jobs and economic growth. The facts/values duality, methodologically and politically functional for a long period of time, is a burden which has to be fundamentally revised. The task is urgent and not simple, requiring administrative, institutional and constitutional changes which are difficult to foresee and manage.

Demarcating innovation: optimization, substitution and the silver bullet approach

Alice Benessia, Interdisciplinary Research Institute on Sustainability, University of

Turin, Italy

The definition of innovation as the engine of economic, social and environmental wealth is the last semantic step of a pervasive narrative of progress that can be traced back - along a co-evolving epistemic and normative trajectory - to the emergence of Scientific Revolution and Modern State. The unchallenged economic policy aims of growth, productivity and competitiveness are fundamental ingredients of this scenario, implying the paradox of sustaining a steady increase in our global resource consumption within a closed, finite system, with limited stocks and bio-geo-chemical resilience. The current dominant narrative of innovation claims a way out of conundrum: natural supplies might be limited but human creativity is unlimited, and so is human power to decouple growth from scarcity, improving efficiency in the use of natural resources and ultimately substituting them altogether, with substantially equivalent, technological optimized artifacts. In this framework, technoscientific innovation allows then for a "sustainable growth" through the *optimization* and the *substitution* of our means, and through the deployment of suitable silver-bullets, protecting us from the complexity of socio-ecological problems as they arise.

This work proposes an epistemic and normative analysis of this narrative of innovation, in order to open a space for reflection on possible alternatives. First, by assuming, as in a thought experiment, that the promises of optimization and substitution inherent in two emergent technologies – the Internet of Things and synthetic biology – are thoroughly fulfilled. Second, by considering what kind of world – and populated by whom – is actually implied in these promises.

Socio-technical imaginaries in research and innovation policy

Roger Strand, Centre for the Study of Sciences and Humanities, University of Bergen, Norway

R&I policy is to a larger extent than many other policy fields a creative enterprise. R&I policy-makers need to envision yet non-existing science and technology. The concept «sociotechnical imaginaries» is borrowed from the research field «science and technology studies» (STS) and was developed by Harvard scholar Sheila Jasanoff. A sociotechnical imaginary is a collective vision of a good future, good in technological and societal terms. Such imaginaries give direction and content to R&I policy as well as legitimize it in terms of the imagined benefits. However, they are often produced by scientists, innovators and non-elected public decision-makers without much wider public participation. Better acknowledgement of the creative character of R&I policy work may allow the creation of more democratic and sustainable technological trajectories. It may also help policy-makers become better aware of degrees of freedom in low-level R&I policy work, down to the drafting of calls for proposals. The knowledge base represented by STS is a valuable resource for this type of development of new narratives for innovation. The Science-and-Society, Science-in-Society and Science-with-and-for-Societyprogrammes of the EU Framework Programmes have developed relevant resources through a number of research projects and support actions, and the cross-cutting "Responsible Research

and Innovation" principle of Horizon 2020 can be utilised to reshape R&I policy to make it smarter, more inclusive and more sustainable.

Resource Sustainability and Innovation

Joseph Tainter, Utah State University, USA

One of the fundamental debates about the future of the industrial way of life concerns the balance between resource depletion and technical innovation. Technological optimists claim that depletion will always be compensated by innovations that lead to more efficient use of resources (more output per unit of resource input), or by development of new resources. In this view, as a resource becomes scarce, prices signal that there are rewards to innovation. Innovators and entrepreneurs accordingly respond with novel technical solutions. Optimists believe that this will always be the case, and that sustainable resource use is therefore not an issue. Technological pessimists focus on absolute limits to resources in a finite world, on returns to investment, and on externalities such as pollution. In the history of the industrialized way of life, the optimists have so far been correct: Innovation has managed to keep pace with depletion, so that over the long run, the prices of many commodities have been constant. The factor overlooked in this debate is that innovation, like other forms of knowledge production, grows in complexity and costliness and produces diminishing returns. This presentation explores the productivity of innovation since the early 1970s to inquire whether our system of innovation can forever offset resource depletion, and even whether it can continue in its present form.

The Keynote Speakers

Andrea Saltelli has worked on physical chemistry, environmental sciences, applied statistics, impact assessment and science for policy. His main disciplinary focus is on sensitivity analysis of model output, a discipline where statistical tools are used to interpret the output from mathematical or computational models, and on sensitivity auditing, an extension of sensitivity analysis to the entire evidence-generating process in a policy context. A second focus is the construction of composite indicators or indices. Till February 2015 he led the Econometric and Applied Statistics Unit of the European Commission at the Joint Research Centre in Ispra (I), developing econometric and statistic applications, mostly in support to the services of the European Commission, in fields such as lifelong learning, inequality, employment, competitiveness and innovation. He participated to the training of European Commission staff on impact assessment. At present he is visiting researcher at the Centre for the Study of the Sciences and the Humanities (SVT) - University of Bergen (UIB), and a host at the Institut de Ciència i Tecnologia Ambientals (ICTA) -Universitat Autonoma de Barcelona (UAB).

Mario Giampietro has BSc degrees in Chemical Engineering and Biological Sciences (Università la Sapienza, Rome), an MSc degree in Food System Economics, and a PhD in the Social Sciences (Wageningen University, the Netherlands). Currently he is ICREA Research Professor at the Institute of Environmental Science and Technology (ICTA) of the Autonomous University of Barcelona (UAB), Spain. He has (co)authored over 150 publications, including six books, in research themes such as multi-criteria analysis of sustainability; integrated assessment of scenarios and technological changes; alternative energy technologies (notably biofuel); energy analysis; biocomplexity and sustainability; multi-scale integrated analysis of societal and ecosystem metabolism; science for governance.

Erik S. Reinhert, a Norwegian citizen, is Professor of Technology Governance and Development Strategies at Tallinn University of Technology. His research area is the theory of uneven growth, i.e. the factors which – contrary to the predictions of standard economic theory – cause world economic development to be such an uneven process. Reinert is also chairman of The Other Canon Foundation in Norway. Reinert holds a BA from Hochschule St. Gallen, Switzerland, an MBA from Harvard University, and a Ph.D. in economics from Cornell University. He has published a large number of articles on economic issues, and his work has taken him to more than 50 countries. Reinert's book *How Rich Countries got Rich and why Poor Countries Stay Poor* (London, Constable & Robinson, 2007) has been published, or is under translation into, about 20 languages. In 2008 he received the Myrdal Prize from the European Association of Evolutionary Political Economy.

Ting Xu is Lecturer at the School of Law, Queen's University, Belfast. Before joining Queen's, she was a Research Fellow at the London School of Economics (2009-2012) on an interdisciplinary and collaborative European Research Council funded project. She holds an LLB from Sun Yat-sen University and an LLM and PhD from the London School of Economics. Her main research interests are in the fields of law, governance and development; property law; property and human rights in a global context; socio-legal studies; political economy; and Chinese law. She has published a monograph and articles in these areas.

Silvio Funtowicz taught mathematics and research methodology in Buenos Aires, Argentina. During the decade of 1980 he was a Research Fellow at the University of Leeds, England. Until his retirement in 2011, he was a scientific officer at the Institute for the Protection and Security of the Citizen (IPSC), European Commission - Joint Research Centre (EC-JRC). Since

February 2012 he is Professor II at the University of Bergen, Norway, based at the Centre for the Study of the Sciences and the Humanities (SVT). He is the author of **Uncertainty and Quality in Science for Policy** (1990, Kluwer, Dordrecht, Chinese version 2010) in collaboration with Jerry Ravetz, and numerous papers in the field of environmental and technological risks and policy-related research.

He has lectured extensively and he is a member of the editorial board of several publications and the scientific committee of many projects and international conferences.

Alice Benessia is a visual artist and research fellow on epistemology of sustainability at the University of Aosta Valley and the Interdisciplinary Research Institute on Sustainability (IRIS) based at the University of Turin. She is a founding member of the Italian Association for Sustainability Science. Her interdisciplinary research deals with epistemological issues arising in the framework of art, science and sustainability, with special interest in visual language. In her photography, she focuses on the relationship between human beings and socio-ecological systems.

Roger Strand (b. 1968 in Norway), originally trained as a natural scientist (dr. scient., biochemistry, 1998), developed research interests in the philosophy of science and has worked on issues of scientific uncertainty and complexity. This has gradually led his research into broader strands of social research, philosophy and broader issues of policy, decision-making and governance at the science–society interface. Strand has coordinated two EU FP7 projects (TECHNOLIFE and EPINET) that addressed the need for a more dynamic governance of science in society. He is currently (2014) Chairman of the European Commission Expert Group on Indicators for Responsible Research and Innovation (RRI).

Joseph A. Tainter is Professor of Sustainability in the Department of Environment and Society, Utah State University, having previously served as Department Head. He received his Ph.D. in Anthropology from Northwestern University in 1975. Dr. Tainter worked on issues of sustainability before the term became common, including his acclaimed book *The Collapse of Complex Societies* (Cambridge University Press, 1988). He is co-editor of *The Way the Wind Blows: Climate, History, and Human Action* (Columbia University Press, 2000), a work exploring past human responses to climate change. With T. F. H. Allen and T. W. Hoekstra he wrote *Supply-Side Sustainability* (Columbia University Press, 2003), the first comprehensive approach to sustainability to integrate ecological and social science. His most recent book is *Drilling Down: The Gulf Oil Debacle and Our Energy Dilemma*, with Tadeusz Patzek (Copernicus Books, 2012). Dr. Tainter has taught at the University of New Mexico and Arizona State University. Until 2005 he directed the Cultural Heritage Research Project in Rocky Mountain Research Station. Dr. Tainter's sustainability research has been used in more than 40 countries, and in many scientific and applied fields. Among other institutions, his work has been consulted in the United Nations Environment Programme, UNESCO, the World Bank, the Rand Corporation, the International Institute for Applied Systems Analysis, the Beijer Institute of Ecological Economics, the Earth Policy Institute, Technology Transfer Institute/Vanguard, and the Highlands Forum. Dr. Tainter has been invited to present his research at the Getty Research Center, the University of Paris (Panthéon-Sorbonne), the Royal Swedish Academy of Sciences, Uppsala University, the Universitat Autònoma de Barcelona, the University of Sheffield, Politecnico di Torino, Alpen-Adria University, the University of Zürich, and many other venues. His research has been applied in numerous fields, including economic development, energy, environmental conservation, health care, information technology, urban studies, and the challenges of security in response to terrorism. He appears in the film *The 11th Hour*, produced by Leonardo DiCaprio, Leila Conners Petersen, Brian Gerber, and Chuck Castleberry, in the ABC News special *Earth 2100*,

and in other documentaries. Dr. Tainter's current research focuses on complexity, sustainability, energy, and innovation.

Appendix 3

List of Participants

first_name	name	organisation
Daniel	Albrecht	Directorate-General Joint Research Centre, European Commission
Sofia	Apostolidou	Directorate-General Interpretation, European Commission
Thomas	Arnold	Directorate-General for Research & Innovation, European Commission
Noelie	Auvergne	ERCEA, Brussels
Andrea	Baggioli	Directorate-General European Neighbour Policy and Enlargement Negotation, European Commission
Ana	Barbosa Lanham	Directorate-General Joint Research Centre, European Commission
Alice	Benessia	University of Turin
Lorenzo	Benini	Directorate-General Joint Research Centre, European Commission
Federica	Boddi	Regione Liguria Sede di Bruxelles
Mark	Boden	Directorate-General Joint Research Centre, European Commission
Melinda	Bodo	Directorate-General for Agriculture and Rural Development, European Commission
Laurent	Bontoux	Directorate-General Joint Research Centre, European Commission
Francisco	Caballero Sanz	Directorate-General for Growth, European Commission
François-Xavier	Chevallerau	LNEGROUP, Brussels
Giorgio	Clarotti	Directorate-General for Research & Innovation, European Commission
Lauren	Crosby	WHO, Brussels
Emanuele	Cuccillato	Directorate-General Joint Research Centre, European Commission
Birgit	De Boissezon	Directorate-General for Research & Innovation, European Commission
Christophe	De Jaeger	GLUON - Network for Art & Research, Brussels
Olga	Diukanova	Directorate-General Joint Research Centre, European Commission

Thomas	Dodd	Directorate-General for Research & Innovation, European Commission
Eszter	Fay	Institutional Affairs European Environment Agency, Brussels
Federico	Ferretti	Directorate-General Joint Research Centre, European Commission
Jan	Feyder	Ambassador of Luxembourg to the U.N. Office, Geneva
Silvio	Funtowicz	University of Bergen
Antonios	Fysekidis	National Contact Point - Business Support and Europe Liaison, Brussels
Agnieszka	Gadzina Kolodziejska	Directorate-General Joint Research Centre, European Commission
Bernd	Gawlik	Directorate-General Joint Research Centre, European Commission
Aliki	Georgakaki	Directorate-General Joint Research Centre, European Commission
Alessia	Ghezzi	Directorate-General Joint Research Centre, European Commission
Mario	Giampietro	Universitat Autonoma Barcelona
Carlo	Gianelle	Directorate-General Joint Research Centre, European Commission
Isabel	Grilo	Directorate-General for Economic and Financial Affairs, European Commission
Ângela	Guimarães Pereira	Directorate-General Joint Research Centre, European Commission
Alan	Haigh	Innovation and Networks Executive Agency
Laura	Hemmati	Cabinet of Commissioner Moedas, European Commission
Elie	Herberichs	EU Business Analyst KPMG EU Office, Brussels
Fernando	Hervas	Directorate-General Joint Research Centre, European Commission
Hristo	Hristov	Directorate-General Joint Research Centre, European Commission
Neil	Hubbard	Directorate-General Joint Research Centre, European Commission
Ioan	Ianos	University of Bucarest
Carmen	Ianosi	Directorate-General for Communications Networks, Content and Technology, European Commission

Lorenzo	Isella	Directorate-General Joint Research Centre, European Commission
Koen	Jonkers	Directorate-General Joint Research Centre, European Commission
Stilyanos	Karagiannis	Directorate-General Joint Research Centre, European Commission
Athina	Karvounaraki	Directorate-General Joint Research Centre, European Commission
Anastasios	Kentarchos	Directorate-General for Research & Innovation, European Commission
Blagoy	Kitanov	Directorate-General Joint Research Centre, European Commission
David	Kolman	Delegate Key Technologies, Brussels
Giovanni	La Placa	Directorate-General Joint Research Centre, European Commission
Patricia	Lamas Sanchez	WHO, Brussels
Philippe	Le Quement	Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs, European Commission
Bartek	Lessaer	Directorate-General for Employment, Social Affairs and Inclusion, European Commission
Anja	Lurson	Officer for Research, Education and Youth, Berlin
Joachim	Maes	Directorate-General Joint Research Centre, European Commission
Rozenn	Marechal	ORGALIME aisbl, Brussels
Francesco	Marra	Europe 2020 Steering Committee, Brussels
Marina	Mastrostefano	Directorate-General for Regional and Urban Policy, European Commission
Elisa	Meloni	Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs, European Commission
Petri	Mirala	Committee of the Regions, Brussels
Jessica	Mitchell	Directorate-General Joint Research Centre, European Commission
Elisa	Molino	IBM, Brussels
Jose	Moya	Directorate-General Joint Research Centre, European Commission
Jorge	Oliveira Teixeira	XZ Innovation & Strategy, Lda., Portugal

Sazan	Pakalin	Directorate-General Joint Research Centre, European Commission
Carla	Palmieri	ERCEA, Brussels
Stefano	Palmieri	EESC, Brussels
Szolt	Pataki	EU Parliament, Brussels
Lino	Paula	Directorate-General for Research & Innovation, European Commission
Chris	Pavlakis	Corallia Cluster Center, Greece
Christophe	Quetel	Directorate-General Joint Research Centre, European Commission
Petri	Räsänen	Council of Tampere Region, Finland
Erik	Reinert	The Other Canon Foundation
Sofia	Ribeiro	WHO, Brussels
Agnieszka	Romanowicz	Directorate-General Joint Research Centre, European Commission
Rossana	Rosati	Directorate-General Joint Research Centre, European Commission
Helena	Ruiz Fabra	Directorate-General Joint Research Centre, European Commission
Agata	Rybarska	Directorate-General Joint Research Centre, European Commission
Julie	Sainz	Directorate-General for Education and Culture, European Commission
Dimitrios	Salampasis	Luxembourg Institute of Science and Technology (LIST), Luxembourg
Andrea	Saltelli	Directorate-General Joint Research Centre, European Commission
Julie	Sainz	Directorate-General Education and Culture, European Commission
Fernando	Sanchez Amillategui	Directorate-General Joint Research Centre, European Commission
Sven	Schade	Directorate-General Joint Research Centre, European Commission
Monika	Schroeder	Directorate-General for Communications Networks, Content and Technology, European Commission
Mantas	Sekmokas	Directorate-General for Employment, Social Affairs and Inclusion, European Commission

Keith	Sequeira	Directorate-General for Research & Innovation, European Commission
Frank	Siebern-Thomas	Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs, European Commission
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Dan	Stanciu	KU Leuven
Roger	Strand	University of Bergen
Vladimír	Šucha	Directorate-General Joint Research Centre, European Commission
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Carolina	Susin	Cefic AISBL - European Chemical Industry Council, Brussels
Katerina	Svickova	Directorate-General Joint Research Centre, European Commission
Tamas	Szabo	INNOVA Észak-Alföld, Hungary
Katarzyna	Szkuta	Directorate-General Joint Research Centre, European Commission
Joseph	Tainter	Utah State University
Stefano	Tarantola	Directorate-General Joint Research Centre, European Commission
Dritan	Tola	Directorate-General for Education and Culture, European Commission
Arie	Van der Zwan	Directorate-General for Research & Innovation, European Commission
Mark	Van Stiphout	Directorate-General for Energy, European Commission
Lieve	Van Woensel	EPRS - European Parliamentary Research Service, Brussels
Ting	Xu	Queen's University, Belfast
Jana	Zifciakova	Directorate-General Joint Research Centre, European Commission
Cristina	Zygomalas	Comunicazione GmbH, Berlin

Appendix 4

Agenda

(As distributed)

European Commission

New narratives for innovation

Brussels, Berlaymont
26-27 February 2015
http://europa.eu/!XC36rM

Programme

Joint Research Centre

Thursday, 26 February 2015 - Friday, 27 February 2015
Berlaymont building, Walter Hallstein Room
Rue de la Loi 200, 1049 Brussels, Belgium

Thursday 26 February 2015

13:00 – 14:00 **Registration and welcome**

14:00 - 14:35 **Opening session**

JRC and innovation: ongoing research and new challenges
Vladimír Šucha, Director-General, Directorate-General Joint Research Centre, European Commission

What if … an introduction to the workshop
Andrea Saltelli, Head of Unit, Econometric and Applied Statistics, Directorate-General Joint Research Centre, European Commission

14:35 - 17:35 **Critique from Academia**

Innovation from a bio-economics perspective
Mario Giampietro, ICREA Research Professor, Institute of Environmental Science and Technology, Universitat Autonoma de Barcelona - 60 minutes with discussion

Loss of Diversity and Decline: Europe, China and the Future of the Global Economy - Part I
Erik Reinert, The Other Canon Foundation, Norway, and Tallinn University of Technology, Estonia - 60 minutes with discussion

Loss of Diversity and Decline: Europe, China and the Future of the Global Economy - Part II
Ting Xu, Queen's University, Belfast - 60 minutes with discussion

Friday 27 February 2015

08:30 - 09:00 — **Registration and welcome**

09:00 - 13:30 — **Critique from Academia, continued**

Innovation, sustainability and the political economy of science
Silvio Funtowicz, Centre for the Study of Sciences and Humanities, University of Bergen, Norway - 40 minutes with discussion

Demarcating innovation: optimization, substitution and the silver bullet approach
Alice Benessia, Interdisciplinary Research Institute on Sustainability, University of Turin, Italy - 60 minutes with discussion

Socio-technical imaginaries in research and innovation policy
Roger Strand, Centre for the Study of Sciences and Humanities, University of Bergen, Norway - 60 minutes with discussion

Resource Sustainability and Innovation
Joseph Tainter, Utah State University, USA - 60 minutes with discussion

13:30 - 14:30 — **Lunch break**

14:30 - 16:00 — **Comments, reflections and implications for policy by the European Commission**

Chair: **Roman Arjona Gracia**, Head of 'Analysis and monitoring of national research policies', Directorate-General for Research and Innovation, European Commission

Selected representatives from policy Directorate-Generals will present their comments and reactions. The session is opened with an introduction from the Chair Roman Arjona

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JRC Mission

As the Commission's in-house science service, the Joint Research Centre's mission is to provide EU policies with independent, evidence-based scientific and technical support throughout the whole policy cycle.

Working in close cooperation with policy Directorates-General, the JRC addresses key societal challenges while stimulating innovation through developing new methods, tools and standards, and sharing its know-how with the Member States, the scientific community and international partners.

Serving society
Stimulating innovation
Supporting legislation

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