

The Future of STI – The Future of STI Policy:

New practices and models of research and innovation as a challenge for STI policy

Eu-SPRI Annual Conference | Vienna 2017

Call for Papers

We would like to invite you to submit paper proposals for the 2017 Annual Conference of the Eu-SPRI Forum: “The Future of STI – The Future of STI Policy”. The conference is organised by the Center for Innovation Systems & Policy of AIT Austrian Institute of Technology and takes place on 7-9 June 2017, in Vienna, Austria.

In the 2017 conference we want to pay special attention to changing practices and patterns of science, technology development and innovation (STI). Not least because of the influence of ICT-enabled novel methods, new ways of doing research and innovation have been established over the past years, and will continue to do so in the next years. They will change the relationship between citizens and science, decision-makers and stakeholders and redraw the landscape of research and innovation actors. The value networks of existing industries will be transformed and the industrial landscape changed, with emerging economies expected to play a much more significant role than today. Furthermore, research will address questions of global significance, and multi-disciplinary communities are increasingly driven by the need to find solutions to such global issues and challenges.

For STI policy research, these upcoming changes will undoubtedly bring about new requirements and challenges. Therefore, the conference also aims to trigger a debate about the future of the discipline(s) of STI policy research.

Session Tracks

For the Call for Papers the LOC together with the Scientific Committee selected 12 Session Tracks from the vast amount of session proposals that was handed in.

Track 1: The Content, Context and Future of STI Policy: Towards a New Framing?

Track 2: The Impact of STI-Policies on the Organization of Research and Production of Knowledge

Track 3: Policy Mixes and New Instruments for Transforming Innovation

Track 4: Next Generation Research Evaluation Governance – Enabling Creative and Responsive Knowledge Production

Track 5: Inclusive Innovation and the Challenges for STI-Policy

Track 6: R&D Networks and Geography: Novel Empirical and Analytical Approaches in a Policy Context

Track 7: What Models of Innovation Governance for Emerging Economies?

Track 8: Social Innovation as a Challenge for a Comprehensive Innovation Policy

Track 9: Nexus Governance: Rethinking the Governance of Large Technical Infrastructures

Track 10: Innovation Ecosystems – a Governance Challenge for Companies and Policy Makers

Track 11: Public-Private Partnerships in Research and Innovation: State of Play and Ways Ahead

Track 12: Open Track

Submission of paper proposals

We would like to invite you to submit paper proposals to one of the 12 Track themes or to the Open Track of the conference. Poster proposals may also be submitted as general submissions under the Open Track.

Submissions must be made online using the form at

<https://easychair.org/conferences/?conf=eusprivienna2017>

Please note that if you have other roles in the EasyChair system (e.g. member of the scientific committee), you should first change your role to "author" by clicking on the link on the first page after logging in to your EasyChair account (using the link above).

You will be asked to choose a track before submitting your paper proposal. If choosing the Open Track you will also be asked whether you want to submit a paper or a poster. Find out more about the 11 Tracks and the Open Track in the attached descriptions or on the conference website.

We ask you include the following information when uploading your paper proposal:

1. Title of the paper proposal
2. Author Information
 - First author* and co-authors (add more if needed, *contact person)
 - E-mail addresses of authors
 - Organisation name, street address, postal code, city, country (of corresponding author)
3. Description
 - The description should clarify the topic of the proposed paper, demonstrate its relevance for the conference and indicate into which session it might fit.

- The proposals will be evaluated on basis of the following criteria:
 - o The relevance of the proposal for the theme of the conference
 - o The innovativeness of the paper
 - o The explicitness of the research and/or policy aims and questions
 - o The outline of the theoretical frameworks, methodological approaches or policy issues to be addressed
 - o The description of the empirical materials to be used
 - o The expected outcomes (in scientific and policy terms) to be achieved
- The length of the paper proposal shall be 1000-1500 words (excluding personal information and references).
- Keywords (3 - 5)

Submission Deadline for paper proposals: 13 February 2017

Notification of acceptance will be made by 1 April 2017

If you are new to EasyChair, you are prompted to create an account. If you have credentials to EasyChair you can use them. The system will ask for the affiliations of the authors, keywords, indication if the submission is a general submission or a submission to one of the Track Themes, and that you should copy/paste the abstract into the slot provided.

For assistance with the submission system contact Katharina Sabetzer via email submissions@eusprivienna.at

The paper proposals will be reviewed by the track chairs as well as by members of the Scientific Committee. The evaluation process will be organized and overseen by the LOC.

Contact information

Further information and updates: <http://euspri-vienna2017.org>

For technical questions regarding the upload of submissions contact Katharina Sabetzer via email submissions@eusprivienna.at

For all other questions contact Dana Wasserbacher & Florian Hainz via email info@eusprivienna.at

TRACK 1: The Context, Content and Future of STI-Policy: Towards a New Framing?

Session Proposers:

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Description:

The world is in transition. Many interlocking environmental, technological, economic, political and cultural trends such as resource depletion, population growth, industrialization, urbanization, inequality or individualization are creating collective challenges (United Nations, 2015) that exceed the ability of any single country, body of governance or scientific discipline to manage them. Our innovation engine is faltering with the fruits of creative destruction increasingly morphing into destructive creation (Soete, 2013). It is amply clear that traditional Science, Technology and Innovation (STI) policy has not delivered on these challenges nor are there good reasons to expect that it would do so in the future. Socio-technical systems need to be significantly reconfigured and STI policies re-invented to rise to the grand challenges. What is needed is not just the improvement of existing STI policy but adding a whole new set of rationales and instruments which would amount to a truly transformative innovation policy.

This diagnosis and respective solutions have recently begun to be articulated under many different labels, for example, Responsible Research and Innovation (Stilgoe et al., 2013), inclusive innovation (Agola and Hunter, 2016), social innovation (Joly, 2016) or the governance of sustainability transitions (Grin et al., 2010). While differing in many aspects the basic themes of these approaches seem to be recurrent: attention to alternative futures and the co-production of science, technology and society, emphasis on the non-neutral nature of technology, focus on disruptive socio-technical systems change in addressing societal and environmental challenges, stress on the transformative potential of civil society and attentiveness to the needs and wants of users and non-users alike. This has led to a suggestion that we might be witnessing the emergence of a new framing of STI policy (Weber and Rohracher, 2012; Schot and Steinmueller, 2016), one markedly different from traditional approaches to STI policy-making that have focused on boosting R&D, promoting entrepreneurship or building innovation systems. The research session is therefore devoted to the exploration the context, content and future of transformative innovation policies.

More specifically, the papers in the session are called to reflect on the following questions:

- What are the implications of changing societal and global context for STI policy? How might broader social and environmental changes facilitate or hinder the potential renewal of STI policy towards transformative change?
- How has STI policy reacted to these changes until now and how are STI policies likely to react/adapt in the future? Which transformative policies and governance arrangements would be useful for addressing the world in transition?

We are interested in theoretical as well as empirical papers: however, all papers should contribute to the debate on how STI policy for transformative change could be articulated and evaluated. The possible topics include (but are not limited to) the following:

- The possible impact of major long-term landscape changes (e.g. the crisis of neoliberalism, the increasing financialization of world economy) or short-term shocks (e.g. financial crisis, Brexit) on STI policy, including its transformative potential
- Innovative approaches that do not only aim to reduce inputs or overall consumption but try to reconfigure the relations between consumers, investors and/or markets (e.g. Freecycle, benefit corporations)
- Stimulating and managing conflict in implementing policies directed towards the achievement of disruptive socio-technical systems change
- Ways of challenging environmentally harmful industrial sectors and socio-technical systems while addressing the possibly accompanying adverse impacts on local economies (e.g. unemployment, decreased energy security, skill mismatch etc.)
- Building multi-level policy mixes (supporting niches, destabilizing regimes, tilting the international playing field), balancing new policy mixes with existing policies
- The challenges and possible futures of STI policy in the context of permanent slow-growth economy or the slowdown in technological progress (Gordon, 2016)?

Empirical research can include individual in-depth case studies, comparative case studies or broader survey-based approaches. We are looking for research at the international, national, regional and local level, and contributions from outside Europe too. The expected outcome of the sessions within this theme is a better articulated overview and analysis of the current situation as outlined above and suggestions for STI policies of the future.

References:

Agola, N. O., and Hunter, A. (Eds.). 2016. *Inclusive Innovation for Sustainable Development: Theory and Practice*. London: Palgrave Macmillan UK.

Gordon, R. J. 2016, *The Rise and Fall of American Growth: The U.S. Standard of Living since the Civil War*. Princeton: Princeton University Press.

Grin, J., Rotmans, J., and Schot, J. 2010. *Transitions to Sustainable Development: New Directions in the Study of Long Term Transformative Change*. New York: Routledge.

Joly, P.-B. 2016. Beyond the competitiveness framework? Models of innovation revisited. *Journal of Innovation Economics & Management* (forthcoming).

Schot, J., and Steinmueller, E. W. 2016. Framing Innovation Policy for Transformative Change: Innovation Policy 3.0. Working paper. Available online: http://www.johanschot.com/wordpress/wp-content/uploads/2016/09/SchotSteinmueller_FramingsWorkingPaperVersionUpdated2018.10.16-New-copy.pdf.

Soete, L. 2013. Innovation, growth and welfare: from creative destruction to destructive creation. Paper for the SPRU DIG-IT workshop Inclusive Growth, Innovation and Technology: Interdisciplinary Perspectives. Available online: <https://www.sussex.ac.uk/webteam/gateway/file.php?name=soete-dig-itworkshopsoete.pdf&site=25>.

Stilgoe, J., Owen, R., and Macnaghten, P. 2013. Developing a framework for responsible innovation. *Research Policy* 42(9): 1568-1580.

United Nations. 25.09.2015. Transforming our world: the 2030 Agenda for Sustainable Development. Resolution adopted by the General Assembly. Available online: http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E.

Weber, K.M., and Rohracher, H. 2012. Legitimizing research, technology and innovation policies for transformative change: Combining insights from innovation systems and multi-level perspective in a comprehensive 'failures' framework. *Research Policy* 41(6): 1037-1047.

TRACK 2: The Impact of STI-Policies on the Organization and Production of Knowledge

Session Proposers:

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Description:

This session will be devoted to understanding how new developments in the governance of science, technology and innovation create impacts at the level of the organization and production of knowledge. The combined effect of EU and national funding practices have led to a significant number of changes at the level of how research is organized and conducted in individual European member states (e.g. Edler et al. 2012; Nedeva 2013). Previously an intensely national effort, STI policies have been incrementally nudged towards a common set of objectives and practices. While debate rages on the degree of isomorphism created by the multi-level governance initiatives that characterize policymaking in the EU member states, the last ten years have witnessed a change in the direction of coordination to include coordination of the systems for governance in and of themselves. This is evidenced in among other things, the increased focus on collaborative priority setting in STI policy and the introduction of joint programming at the EU and national levels.

Further examination of different national efforts in key areas such as funding instruments and evaluation practices would however reveal that the curtain of sameness often disguises significant differences at the level of implementation, reception by target communities and policy design (Lepori, B. 2011; Borlaug 2015; Whitley 2003). Noteworthy examples of areas where these effects may be observed include the popularity of Centre of Excellence initiatives and the overriding policy consensus that grand societal challenges constitute the appropriate priority setting mechanism for all member states. Likewise, the frequency with which member states ape the European Research Council's Starting and Advanced Investigator Awards suggests that the rhetoric of path breaking research is also a key element in the increasing convergence of policy instruments. Other areas may be indicators for performance-based funding, which have attracted a great deal of attention both from scholars and stakeholders, but the impact of which is nevertheless under explored (Gläser and Laudel, 2016; Aagaard and Schneider, 2015).

The session seeks to attract papers which will enhance our knowledge on the impact of STI policies on the organization and production of knowledge. This session invites conceptual and empirical papers that focus, on among other things, the impact of funding structures and the distribution of funding on the strategic capabilities of public research organizations and research performance; the role of collaborative governance initiatives; changes in the governance of funding streams and new models of research and innovation, e.g. stronger

involvement of social actors, responsible research and interdisciplinary research. We invite papers on questions such as:

- In what ways may policies for excellence affect the strategic capabilities of public research organizations?
- How do different funding structures and streams impact the production of scientific knowledge?
- How do collaborative governance initiatives and the inclusion of other social stakeholders impact the organization of research and research content?
- What is the role of governance in promoting new fields of research and innovation?

Several scholars have examined questions similar to the above using neo institutional or rational choice frameworks. There is also a significant number of historical studies which provide rich material for using the past to provide more fine-grained understanding and analyses of the effects of different governance initiatives on the evolution of national research systems. We welcome papers based on all types of research methodologies and theoretical frameworks as diversity is an important prerequisite for furthering the frontier of knowledge.

References:

Aagaard, K. and Schenider, J. (2015) Research funding and national academic performance: Examination of a Danish success story. *Science and Public Policy*. 43 (4): 518-531

Borlaug, S. B. (2015) Moral hazard and adverse selection in research funding: Centres of excellence in Norway and Sweden. *Science and Public Policy* 43 (3): 352-362.

Edler, J., Frischer, D., Glanz, M. and Stampfer, M. (2012) Case Studies of Universities and Research Organisations. *The Impact of the ERC on universities and public research organisations*. Eurecia. The European Research Council.

Gläser, J. and Laudel, G. (2016) Governing Science. *European Journal of Sociology*. 57: 117-168

Lepori, B. (2011) Coordination modes in public funding systems. *Research Policy* 40: 355-367.

Nedeva, M. (2013) Between the global and the national: Organising European science. *Research Policy* 42: 220-230.

Whitley, R. (2003) Competition and pluralism in the public sciences: the impact of institutional frameworks on the organisation of academic science. *Research Policy*, 32, 1015-1029.

TRACK 3: Policy Mixes and New Instruments for Transforming Innovation

Session Proposers:

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Description:

Within innovation studies, there has recently been an increasing interest in policy mixes with several contributions published in *Research Policy* (Flanagan et al. 2011; Magro and Wilson 2013; Quitzow 2015; Kivimaa and Kern 2016) and other innovation studies journals (Borrás and Edquist 2013; Reichardt and Rogge 2016; Reichardt et al. 2016; Uyarra et al. 2016). Policy mixes can be understood as “complex arrangements of multiple goals and means which, in many cases, have developed incrementally over many years” (Kern and Howlett 2009: 395). While it has long been acknowledged that a combination of technology push and demand pull instruments is required for stimulating innovation (e.g. Freeman 1987, OECD 1999, EC 2003, Aho et al 2006, Aschhoff and Sofka 2009), how such instruments interact and form policy mixes has only recently become of interest to the STI community (e.g. Nauwelaers et al. 2009, Flanagan et al. 2011). There is also an emerging discussion on the need for systemic instruments to address grand societal challenges (Wieczorek and Hekkert 2012, OECD 2015a) or the need for novel STI policies to foster transformative innovation (Schot and Steinmueller 2016, Edler and Yeow 2016).

It has been increasingly pointed out that today’s grand societal challenges, such as addressing health, climate change, and security, call for new approaches to design and combine policy instruments (Bason 2014, Carstenson and Bason 2012, Kimbell 2015, Tonurist, Kattel and Lember 2015). More specifically, it has been argued that policy mixes are required in order to address not only traditional market failures such as underinvestment in R&D or negative environmental externalities such as greenhouse gas emissions, but also structural and transformational system failures, such as institutional failures or failures regarding guiding the direction of a transformation process (Weber and Rohracher 2012). However, the majority of academic contributions so far focused on policy mixes as portfolios of instruments originating from various governance levels and policy fields, paying particular attention to interactions between instruments (del Rio 2014, Guerzoni and Raiteri 2016). Yet, in the context of transformations 2 (or what the OECD calls system innovation), a broader perspective on policy mixes has been proposed (Weber and Rohracher 2012; Flanagan et al 2011; Rogge and Reichardt 2016).

This has a number of implications for policy mix research in the context of transformative STI policy: First, the need for steering the direction of innovation is argued to require greater analytical attention to credible long-term policy strategies, such as the recent Paris Agreement on limiting global warming, and their role in redirecting corporate innovation strategies (Schmidt et al. 2012; Rogge et al 2011). Second, studies have argued for greater attention to the policy processes through which such policy strategies, targets and

instruments come into being, both because of their explanatory power regarding the design of policy mixes and due to their direct influence on innovation processes (Boekholt 2010; Chung 2013; Williamson 2015). Third, attention has also shifted to the co-evolution of policy making and technological change and thus to dynamic changes in policy mixes (Hoppmann et al., 2014; Reichardt et al. 2016). Forth, there is also a critical appreciation that real-world policy mixes may never be completely consistent and coherent but that policy makers should strive for an increased coordination across policy levels and policy fields to improve the effectiveness of these mixes for stimulating innovation (Flanagan et al. 2011; Kern et al. 2017). Fifth, it has also been argued that in the context of grand societal challenges innovation policy mixes aiming at structural change within a sector such as energy, transport, and health may need to pursue simultaneously the 'creation' of new innovations as well as the 'destruction' of incumbent systems (Kivimaa and Kern 2016). Sixth, because of the inherently 'experimental' nature of STI policy new practices and models focusing on inclusive policy making and co-creation are seen as a promising new avenue to achieve robust innovation policy results for growth, jobs, and welfare (OECD 2015b; OECD 2016).

This research session aims to bring together papers which address such a broader policy mix perspective for transformative STI (including novel STI instruments) and as such specifically calls for contributions addressing the following topics:

- Conceptual improvements of policy mix thinking: How can we better conceptualise policy mixes for system innovation and go beyond an understanding which purely focusses on desired combinations of instruments?
- Policy mix characteristics: Which influence do broader characteristics of policy mixes, such as their consistency, comprehensiveness, credibility or coherence have on STI?
- Directionality of policy mixes: What is the role of long-term policy targets and their credibility for innovation processes? How can governments improve the perception of the credibility of policy signals by innovators? How do companies make sense of conflicting policy signals and how does this influence their innovation strategies?
- Co-evolutionary dynamics of policy mixes: How do policy mixes emerge over time, how do they impact on STI, and how do these impacts influence the further evolution of policy mixes?
- Next generation innovation policy instruments: Which new instruments could be utilized to consider the changing relationship between citizens, science, industry, and policy? What is the potential of demand-side measures such as innovation procurement, regulation and standards and how can demand-side and supply-side policies be integrated in an effective policy mix? How can co-creative and inclusive mechanisms such as innovation policy labs, sandboxes and incubators facilitate the match between supply and demand for innovative ideas?
- Assessment of instrument interactions: How to analyze the effects of simultaneously existing policy instruments and the feed-back loops between them in innovation

ecosystems? How do next generation innovation policy instruments interact with other measures within the policy mix?

- Policy processes and policy mixes: What can STI scholars interested in policy mixes learn from the policy studies literature? How can we analyse the politics of policy mixes aimed at addressing transformative change? Which implications can be drawn for managing resistance to change?
- Institutional implications of policy mixes: Which implications result from the complexities arising from policy mixes for innovation for institutional designs, administrative capacities, and policy learning across multiple jurisdictions?
- Policy mixes for creative destruction: Which role do policies aimed at phasing out undesired technologies or practises play for innovation in competing alternatives?
- Methodological novelty in analysing policy mixes: Which research designs, novel qualitative and quantitative methods, new data sources and operationalisations of policy mixes are best suited to studying policy mixes and their role in transformative innovation processes? Which are useful approaches for boundary setting and establishing causal relationships between policy mixes and innovation?

We invite conceptual as well as empirical papers which address any of the questions raised above.

References :

Aho E., et al. (2006) *Creating an innovative Europe: Report of the independent expert group on R&D following the Hampton Court Summit*. Luxembourg, Office for Official Publications of the European Communities

Aschhoff B. & Sofka W. (2009) Innovation on demand: Can public procurement drive market success of innovations? *Research Policy* 38: 1235-1247

Bason, M. C. (2014) *Design for policy*: Gower Publishing Ltd.

Boekholt, P. (2010) The evolution of innovation paradigms and their influence on research, technological development and innovation policy instruments, in: Smits, R., Kuhlmann, S., Shapira, P. (Eds.), *The theory and practice of innovation policy - An international research handbook*. Edward Elgar, Cheltenham, pp. 333-359.

Borrás, S. and C. Edquist (2013) The choice of innovation policy instruments. *Technological Forecasting and Social Change* 80(8): 1513-1522.

Carstensen, H. V. and Bason, C. (2012) Powering Collaborative Policy Innovation: Can Innovation Labs Help? *The Innovation Journal: The Public Sector Innovation Journal*, 17(1), 1-26.

Chung, C. (2013) Government, policy-making and the development of innovation system: The cases of Taiwanese pharmaceutical biotechnology policies (2000 – 2008). *Research Policy* 42, 1053–1071.

- Del Rio, P. (2014) "On evaluating success in complex policy mixes: the case of renewable energy support schemes." *Policy Sciences* 47: 267-287.
- EC (2003) Raising EU R&D intensity: Improving the effectiveness of the mix of public support mechanisms for private sector research and development. Brussels, Report to the European Commission by an Independent Expert Group.
- EC (2016) Open innovation, open science, open to the world: A vision for Europe. Brussels, European Commission.
- Edler J. and Yeow J. (2016) Connecting demand and supply: The role of intermediation in public procurement of innovation. *Research Policy* 45: 414-426
- Flanagan, K., E. Uyarra and M. Laranja (2011) Reconceptualising the 'policy mix' for innovation. *Research Policy* 40(5): 702-713.
- Freeman C. (1987) *Technology policy and economic performance: Lessons from Japan*. London and New York, Pinter.
- Guerzoni, M. and Raiteri, E. (2015) Demand-side vs. supply-side technology policies: Hidden treatment and new empirical evidence on the policy mix. *Research Policy*, 44(3): 726–747.
- Hopmann, J., J. Huenteler and B. Girod (2014) Compulsive policy-making—The evolution of the German feed-in tariff system for solar photovoltaic power. *Research Policy* 43(8): 1422-1441.
- Kern, F. and M. Howlett (2009) Implementing Transition Management as Policy Reforms: A Case Study of the Dutch Energy Sector. *Policy Sciences* 42(4): 391-408.
- Kern, F., Kivimaa, P., & Martiskainen, M. (2017) Policy packaging or policy patching? The development of complex energy efficiency policy mixes. *Energy Research & Social Science*, 23, 11–25.
- Kimbell, L. M. H. (2015) *Applying Design Approaches to Policy Making: Discovering Policy Lab*. Brighton: University of Brighton.
- Kivimaa, P. and F. Kern (2016) Creative destruction or mere niche support? Innovation policy mixes for sustainability transitions. *Research Policy* 45(1): 205-217.
- Magro, E. and J. R. Wilson (2013) Complex innovation policy systems: Towards an evaluation mix. *Research Policy* 42(9): 1647-1656.
- Nauwelaers, C., P. Boekholk, B. Mostert, P. Cunningham, K. Guy, R. Hofer and C. Rammer (2009) *Policy mixes for r&d in Europe*. European Commission—Directorate-General for Research, Maastricht.
- OECD (1999) *Managing national innovation systems*. Paris, Organisation for Economic Co-operation and Development.
- OECD (2010) *The Innovation Policy Mix*, in *OECD Science, Technology and Industry Outlook 2010*, OECD Publishing. http://dx.doi.org/10.1787/sti_outlook-2010-48-en
- OECD (2011) *Demand-side innovation policies*. Paris, Organisation for Economic Co-operation and Development.
- OECD (2015a) *System Innovation: Synthesis Report*, Paris, <https://www.innovationpolicyplatform.org/system-innovation-oecd-project>.

- OECD (2015b) Innovation policies for inclusive development: Scaling up inclusive innovations. Paris, Organisation for Economic Co-operation and Development.
- OECD (2016) Open government: The global context and the way forward. Paris, Organisation for Economic Co-operation and Development.
- Quitow, R. (2015) Assessing policy strategies for the promotion of environmental technologies: A review of India's National Solar Mission. *Research Policy* 44(1): 233-243.
- Reichardt, K., & Rogge, K. (2016) How the policy mix impacts innovation: Findings from company case studies on offshore wind in Germany. *Environmental Innovation and Societal Transitions*, 18, 62-81.
- Reichardt, K., Negro, S. O., Rogge, K. S., & Hekkert, M. P. (2016) Analyzing interdependencies between policy mixes and technological innovation systems: The case of offshore wind in Germany. *Technological Forecasting and Social Change*, 106, 11-21.
- Rogge KS, Schneider M and Hoffmann V. (2011) The Innovation Impact of the EU Emission Trading System — Findings of Company Case Studies in the German Power Sector, 70 *Ecological Economics* 513.
- Rogge, K. S., & Reichardt, K. (2016) Policy mixes for sustainability transitions: An extended concept and framework for analysis. *Research Policy*, 45(8): 1620–1635.
- Schmidt, T. S., M. Schneider, K. S. Rogge, M. J. Schuetz and V. H. Hoffmann (2012) The effects of climate policy on the rate and direction of innovation: A survey of the EU ETS and the electricity sector. *Environmental Innovation and Societal Transitions* 2: 23-48.
- Schot, J. and Steinmueller, E. (2016) Framing Innovation Policy for Transformative Change: Innovation Policy 3.0, <http://www.johanschot.com/wordpress/wp-content/uploads/2016/09/Framing-Innovation-Policy-for-Transformative-Change-Innovation-Policy-3.0-2016.pdf>
- Tonurist, P., Kattel, R. and Lember, V. (2015) Discovering Innovation Labs in the Public Sector: TUT Ragnar Nurkse School of Innovation and Governance.
- Uyarra, E., P. Shapira and A. Harding (2016) Low carbon innovation and enterprise growth in the UK: Challenges of a place-blind policy mix. *Technological Forecasting and Social Change* 103: 264-272.
- Weber, K. M., & Rohracher, H. (2012) Legitimizing research, technology and innovation policies for transformative change: Combining insights from innovation systems and multi-level perspective in a comprehensive 'failures' framework. *Research Policy*, 41(6), 1037-1047.
- Wieczorek, A. J. and M. P. Hekkert (2012) Systemic instruments for systemic innovation problems: A framework for policy makers and innovation scholars. *Science and Public Policy* 39(1): 74-87.
- Williamson, B. (2015) Testing governance: the laboratory lives and methods of policy innovation labs. *Journal of Educational Administration and History*, 47(3), 251–271.

TRACK 4: Next Generation Research Evaluation Governance – Enabling Creative and Responsive Knowledge Production

Session Proposers:

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Description:

Creative research and knowledge production are required to address the so-called Grand Societal Challenges (Kuhlmann & Rip 2014). Research and innovation activities are supposed to become “responsive” to societal needs. This request has been put forward by the European Commission and in several EU Member States (see e.g. the “Rome Declaration on Responsible Research and Innovation in Europe” 2014), yet more recently also in emerging economies and their research and innovation systems, not at least in China. Governance approaches to research and innovation, in particular funding policies and performance incentives as well as related evaluation processes will have to reflect such ambitions – this is the focal concern of the suggested session (track).

Research evaluation and related performance measurement, in advanced and in emerging countries, have become increasingly professionalised in recent years. Yet most of the implemented measures are focussed on simplistic “excellence” criteria (Rip 2012). Where research “impact” criteria are used they are all too often defined in a quite mechanistic way (Spaapen & van Drooge 2011).

The professionalised research performance evaluation can be seen as a form of governance of research. In the last few years it has been provoking increasingly harsh criticisms from researcher communities (e.g. DORA, initiated by the American Society for Cell Biology, Way & Ahmad 2013) and sociologists of science (e.g. the “Leiden Manifesto for Research Metrics”, Hicks et al. 2015). The critics warn against a misfit between increasingly bureaucratised simplistic research performance evaluation governance and the need for incentives stimulating creative, risk taking research.

Meanwhile we have witnessed growing efforts, in advanced and emerging countries, to overcome this misfit. In 2015, UK HEFCE published a report titled “The Metric Tide Report of the Independent Review of the Role of Metrics in Research Assessment and Management” (Wilsdon et al. 2015), which proposed a framework for responsible metrics, and made a series of targeted recommendations based on fifteen months of evidence-gathering, analysis and consultation. These indicators and underlying data infrastructure developed are designed in the ways that support the diverse qualities and impacts of UK research.

Similarly in China, the blunt uses of metrics such as SCI publications, journal impact factors and grant income targets are worrying. The country’s leading academic institution for the natural sciences and the highest science and technology advisory body, the Chinese

Academy of Sciences (CAS), so far, has experienced four phases of their institute evaluation system, reflecting the history of using metrics within the CAS and China. The latest reform of the system in 2010, also known as the major R&D outcome-oriented evaluation system, was proposed to encourage creative and original research work. Not only research institutes, but also Chinese universities, have already taken action to change the orientation of research evaluation towards creative and original knowledge production or real-problem solving, rather than counting publications.

Given the development of science, and the mission to address societal challenges, research drawing on multiple disciplines is more needed than ever. That is also why “convergence science” is becoming an emerging research paradigm (Bonaccorsi 2008). The eight research fields in CAS’s 13th Five-year plan also indicate the concept of convergence science. There is no doubt that evaluation of convergence science will be a new challenge in near future.

In this context, the proposed session will provide a forum to discuss new approaches on research evaluation, reflecting the required responsiveness of research and innovation and “responsive” governance principles and requirements (e.g. Kuhlmann et al. 2015).

Guiding aspects to be addressed by session papers include:

- Trends of governance of and through research evaluation in an international perspective;
- Modes of responsive evaluation of different research paradigms, e.g. inter-disciplinary research, convergence research;
- New concepts and responsive practices of third-party evaluations, e.g. talents evaluation, programme evaluation, faculty or institute evaluation;
- Responsive assessment of mission-oriented research (Grand Challenges) and of societal impact.

References:

Bonaccorsi, A. (2008), Search regimes and the industrial dynamics of science. *Minerva*, 46(3), 285-315.

Hicks, D.; Wouters, P. et al. (2015), Leiden Manifesto for Research Metrics, *Nature*, April 2015, 429pp.

Kuhlmann, S., Rip, A. (2014), The challenge of addressing Grand Challenges. A think piece on how innovation can be driven towards the “Grand Challenges” as defined under the European Union Framework Programme Horizon 2020, Report to ERIAB; DOI: 10.13140/2.1.4757.184

Kuhlmann, S., Edler, J., Ordóñez-Matamoros, G., Randles, S., Walhout, B., Gough, C., Lindner, R. (2015), *Responsibility Navigator*, Karlsruhe/Germany (Fraunhofer ISI), www.responsibility-navigator.eu.

Published also in: Lindner, R., Kuhlmann, S., Randles, S., Bedsted, B., Gorgoni, G., Griessler, E., Loconto, A., Mejlgaard, N. (2016) (eds.): *Navigating Towards Shared Responsibility in Research and Innovation. Approach, Process and Results of the Res-*

AGorA Project. Karlsruhe/Germany (Fraunhofer ISI), 132-155 (ISBN: 9-783000-517099; www.res-agera.eu)

Rip, A. (2011), Science Institutions and Grand Challenges of Society: A Scenario. *Asian Research Policy*, 2, 1-9.

Rome Declaration on Responsible Research and Innovation in Europe (2014), https://ec.europa.eu/research/swafs/pdf/rome_declaration_RRI_final_21_November.pdf

Spaapen, J., & Van Drooge, L. (2011), Introducing 'productive interactions' in social impact assessment. *Research Evaluation*, 20(3), 211-218.

Way, M., & Ahmad, S. A. (2013), The San Francisco Declaration on Research Assessment. *Journal of Cell Science*, 126(9), 1903–1904.

Wilsdon, J., et al. (2015), *The Metric Tide: Report of the Independent Review of the Role of Metrics in Research Assessment and Management*. DOI: 10.13140/RG.2.1.4929.1363

TRACK 5: How Can Emerging Technologies Be Inclusive? Inclusive Innovation and the Challenges for STI-Policy

Session Proposers:

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Description:

Inclusive innovation suggests that science, technology and innovation should not only be aligned to economic needs but should also reflect societal concerns and address the needs of the poorest and more vulnerable part of the population. Ideas related to inclusive innovation can be traced back to Robert Owen's small-scale mills in England in the early 1800's, and Gandhi's philosophy from the early 1900's, which influenced the work of the economist Fritz Schumacher on appropriate technologies in the 70's (Chataway et al. 2014). Although distant in time, these critical ideas remind us that technological development raises longstanding problems of social inequality related to the production and use of artefacts. A well-known global challenge, social inequality has been rising within European countries as well as in the US, and should no longer be considered exclusive to less economically developed countries from the global South. However, despite its relevance to research policy and evaluation, inclusive innovation is still a largely overlooked concept in the innovation studies literature (Foster and Heeks 2013).

Inclusive innovation could complement responsible research and innovation (RRI) frameworks as a parallel approach that brings on board a fundamental and missing discussion on social equity in the governance of emerging technologies. One of the few contemporary scholars exploring the notion of inclusive innovation applied to the case of emerging technologies is Doris Schroeder, who has argued that inclusive innovation may work as a bridging concept between system innovation approaches (as non-normative, descriptive) and RRI (as a normative concept) (Schroeder et al. 2016). Despite its inherent challenges, inclusive innovation could work as a tool for social development, where the notion of social justice is a central piece of the innovation process (Smith et al. 2013). Through engaging a broader range of people, concerns and values, collaborative learning

and co-production processes are fundamental in achieving this (see Vooberg et al. 2015 for a review).

The question of whose and what values are accounted for in the development of science and technology and their social appraisal (Sarewitz 2016) requires a focus on equity and understandings of societal needs (Grimshaw et al. 2011). Through the lens of inclusive innovation, looking at emerging technologies in the fields of, for example, synthetic biology and nanotechnology, one would ask a) how societal needs, benefits and potential negative impacts of these technologies are defined and by whom and b) how benefits and trade-offs are likely to be socially distributed (regionally, nationally and/or internationally). These questions complement and expand the more typical economic approaches to the analysis of the societal benefits of technology and innovation.

In this session we are interested in unpacking the concept of inclusive innovation and using it as lens to analyse emerging technologies. By doing so, we would like to encourage broadening the scope of both inclusive innovation and RRI, moving beyond their internal debates, and favouring a global outlook. We seek reflection on how inclusive innovation could make a positive contribution to the development of emerging technologies and what challenges the operationalization of inclusive innovation might pose to science, technology and innovation policy. We would like to invite theoretical and empirical contributions that engage either directly or indirectly with the concept of inclusive innovation, both in the European and/or international contexts. The following questions include some of the aspects we would like to explore during the session and to reflect on after the conference to inform a discussion piece (paper proposals do not necessarily need to be limited to them):

- What are the different understandings of the notion of “inclusiveness” being mobilised in innovation in emerging technologies, especially in the case of synthetic biology, nanotechnology, and next generation manufacturing?
- How has inclusive innovation been articulated in the context of emerging economies by multilateral organisations such as the UN, World Bank and OECD?
- What are the main concepts behind inclusive innovation in academic and policy circles?
- How can inclusive innovation be operationalized? Which tools can be useful and what are the criteria that can be used when assessing emerging technologies?
- What are the differences between inclusive innovation being articulated in the case of technological innovation and of other forms of innovation, such as social innovation and grassroots innovation?
- How co-production/co-creation is understood within the context of inclusive innovation?
- How can inclusive innovation be addressed in innovation governance and science, technology and innovation policy and what are the challenges to this?

References:

Chataway, J., Hanlin, R., & Kaplinsky, R. (2014). Inclusive innovation: an architecture for policy development. *Innovation and Development*, 4(1), 33–54.

Foster, C., & Heeks, R. (2013). Conceptualising Inclusive Innovation: Modifying Systems of Innovation Frameworks to Understand Diffusion of New Technology to Low-Income Consumers. *European Journal of Development Research*, 25(3), 333–355.

Grimshaw, D. J., Gudza, L. D., & Stilgoe, J. (2011). How can nanotechnologies fulfil the needs of developing countries? In S. E. Cozzens & J. M. Wetmore (Eds.), *Nanotechnology and the Challenges of Equity, Equality and Development* (pp. 379–391). Springer Science+Business Media.

Sarewitz, D. (2015). Science can't solve it [Comment]. *Nature*, 522, 413–414.

Schroeder, D., Dalton-Brown, S., Schrempf, B., & Kaplan, D. (2016). Responsible, Inclusive Innovation and the Nano-Divide. *NanoEthics*, 10(2), 177–188.

Smith, A., Fressoli, M., & Thomas, H. (2013). Grassroots innovation movements: Challenges and contributions. *Journal of Cleaner Production*, 63, 114–124.

Voorberg, W.H., Bekkers, V.J.J.M., & Tummers, L.G. (2015). A Systematic Review of Co-Creation and Co-Production: Embarking on the social innovation journey. *Public Management Review*, 17(9), 1333-1357.

TRACK 6: R&D Networks and Geography: Novel Empirical and Analytical Approaches in a Policy Context

Session Proposers:

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Description:

The focus of the proposed research track will be on the geography of networks and R&D collaborations in a STI policy context. Special emphasis is placed on the spatial dimension of policy induced interactions between organisations performing joint R&D, for instance in the form of collaborative research projects. Such interactions have attracted a burst of attention in the last decade, both in the scientific study of the networks, as well as increasingly in the policy sector. Specifically the study of the spatial dimension of R&D networks has meanwhile become an essential and fascinating domain for advanced research on the spatial and temporal evolution of innovation systems at different spatial scales (see, e.g., Scherngell 2013). Also from a policy perspective, the analysis of the spatial dimension of R&D networks is of high relevance, for instance EU level, considering the policy goal that networks of actors performing joint R&D should span the territory of the EU, and, by this, affect the circulation of knowledge and researchers in a Europe-wide system of innovation (see Hoekman and Frenken 2013).

However, specifically in a policy context, empirical works that have been conducted up to now often remain unsatisfactory. This is mainly related to the analytical and methodological approaches used, as well as a lack of systematic and clean data on R&D networks. One crucial aspect in this context is the difficulty to isolate policy effects (i.e. additionalities) on the development of such networks over geographical space and time, and to grasp impacts of policy induced R&D networks on – generally speaking – the socio-economic development of organization, regions or countries in a more systematic way. On top of the research agenda in this context is, for instance, the investigation of structural and dynamic impacts of policy induced R&D networks on knowledge creation and inventive behaviors of innovating actors, and the innovative capability of regions, countries or the EU as a whole.

Recently, scholars have started to combine network analytical approaches with spatial econometrics in analyzing the geography of policy induced R&D networks, in comparison to co-publication and co-patent networks (see Varga et al. 2014, Wanzenböck et al. 2014). The integration of spatial analysis methods in combination of network analysis seems particularly promising in this respect, as is the complementary usage of simulation techniques to e.g. frame different policy scenarios. Concerning the empirical side, it is worth noting that novel data infrastructures have been established recently, e.g. under the umbrella of the RISIS infrastructure (risis.eu), collecting and systematizing data for science, innovation and policy studies. These new data infrastructures show great potential for capturing and modelling impacts of policy induced R&D networks in a more systematic way, but they have only hardly been exploited up to now.

Against this background, this track will shift attention to novel methodological approaches and empirical strategies for the analysis of policy induced R&D networks, particularly emphasizing the relevance of their geographical dimension when capturing policy impacts. By novel empirical and analytical approaches, we refer to both, models and new data infrastructures that are able to capture R&D networks. By this, the track is intended to bring together a selection of contributions providing novel empirical insights into the geographical dynamics of policy induced networks and R&D collaborations, in particular across Europe by focusing on e.g. networks funded under the European Framework Programmes (FP).

The contributions to the track will employ new, systematic data sources, e.g. by drawing on information given in new datasets provided by RISIS. Further, innovative methodologies will be proposed to capture policy impacts, ranging from cutting-edge spatial analysis and spatial econometric techniques, network modelling techniques as well as simulation, such as agent-based modelling (ABM) approaches. In that sense, it welcomes contributions on analytic advances and methodology, on structure and spatial characteristics of policy induced R&D networks, and on impacts of R&D networks on knowledge creation and innovation activities. The latter may be specifically contextualized in contributions focusing on policy impacts in the context of Key Enabling Technologies (KET) or Societal Grand Challenges (SGC) as major cornerstones of the current EU STI policy.

References:

Hoekman, J., and Frenken, K. (2013). Proximity and stratification in European scientific research collaboration networks: a policy perspective. In Scherngell, T. (2013) *The Geography of Networks and R&D Collaborations* (pp. 263-277). Springer International Publishing.

Scherngell, T. (ed.) (2013): *The Geography of Networks and R&D Collaborations*. Advances in Spatial Science Series. Springer-Physica Verlag, Berlin-Heidelberg-New York

Varga A, Pontikakis D, Chorafakis G (2014) Metropolitan Edison and cosmopolitan Pasteur? Agglomeration and interregional research network effects on European R&D productivity. *Journal of Economic Geography* 14:229–26

Wanzenböck I, Scherngell T, Brenner T (2014) Embeddedness of regions in European knowledge networks. A comparative analysis of inter-regional R&D collaborations, co-patents and copublications. *The Annals of Regional Science* 53:337–368

TRACK 7: What Models of Innovation Governance for Emerging Economies?

Session Proposers:

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Description:

Innovation, technological and social, is key for boosting the economies and the institutional capacities of emerging countries. Although stable public innovation policies are necessary, a better understanding of the specific governance challenges in those countries is required. Their institutional setting, while differing substantially country by country, is by and large characterised by instability, lack of trust, and even violence. Indeed, emerging countries are exposed to conditions differing quite substantially from the dominant OECD model of innovation policy for development and welfare.

Hence, focusing on innovation governance and public policies in emerging countries, this session aims at gathering a group of scholars willing to discuss related governance failures and to jointly explore options for alternative, more efficient approaches (Stefan Kuhlmann & H.G. Ordonez-Matamoros, 2017).

For so doing, the convenors invite papers that bring a new perspective on innovation policy, focusing on governance issues resulting from the 'dance' (Kuhlmann, Shapira, & Smits, 2010), i.e. the interplay between innovation policy, theory and practice in emerging countries to

- better understand failures and opportunities,
- acknowledge that there are different perspectives on the role of innovation policies for development, where a more systematic discussion on the possible causes explaining the lack of progress on the use of innovation for development as a key governance challenge in poor countries is judged necessary,
- new options and emerging opportunities for change are identified at the conceptual and policy levels reflecting the emergence of the option for a 'turn' from the traditional growth-and-competitiveness-based innovation policy towards a more social-distributive-inclusive-based innovation policy, and
- feasibility and practical relevance of this turn is assessed. For so doing, careful policy analysis and evaluation are indeed needed.

References:

Kuhlmann, Stefan, & Ordonez-Matamoros, H.G. (Eds.). (2017). *Research Handbook on Innovation Governance for Emerging Economies: Towards Better Models*. Cheltenham, U.K. and Northampton, MA. USA.: Edward Elgar.

Kuhlmann, Stefan, Shapira, Philip, & Smits, Ruud E. (2010). Introduction. *A Systemic Perspective: The Innovation Policy Dance*. In R. E. Smits, S. Kuhlmann & P. Shapira (Eds.), *The Theory and Practice of Innovation Policy - An International Research Handbook*. Cheltenham, U.K. and Northampton, MA. USA.: Edward Elgar Publishing.

TRACK 8: Social Innovation as a Challenge for a Comprehensive Innovation Policy

Session Proposers:

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Description:

Research into innovation has a long history, arguably dating back to the pioneering work of Schumpeter in the early 20th century (2006). Much of the early theoretical work emphasised the socio-cultural dimensions of innovation (Kallen, 1932; Tarde, 1903; Ogburn, 1966). However, this socio-cultural dimension was displaced by more economic and technological perspectives, in part because of the increasing importance of innovation to economy and society, and greater policy interest to stimulate innovation for economic growth. Indeed, a belief in the central role of science and technologies for socio-economic development is still the basis for contemporary innovation policies as well as much of the scientific discourse on various kinds of “Innovation Systems”.

In recent years, in parallel with this, there has been a growing realisation that both innovation research and policy is falling short of its potential to address the multiple globally-derived challenges that affect contemporary and future societies. Attempts to address these challenges through innovation demand a better understanding of ‘the new nature of innovation’, including the changing role of technologies (FORA, 2010). These challenges are not only grand in scope and scale, but also complex, made up of wicked problems and “largely impervious to top-down rational planning approaches” (Cagnin, Amanatidou & Keenan, 2012, p. 141). There may exist a potential relationship between increasingly economic-functional perspectives on innovation, and the growing disassociation between innovation and the so-called ‘grand challenges’.

Against this background of emerging paradoxes and confusion in prevailing innovation perspectives, it is clear that technology-oriented innovation paradigm relevant for the industrial society is becoming increasingly less functional. International innovation research is providing a variety of indicators where we are witnessing a fundamental shift in the nature of innovation (Fagerberg et al., 2005). What we might consider to be this new paradigm is characterized by at least three key stylised processes, namely:

- (1) The opening-up of the innovation process to society,
- (2) its orientation by the major societal challenges, and

(3) a stronger recognition of non-technological innovations geared to changing social practices.

What is common to all these three categories is the expansion of the purview of innovation to cover more explicitly social domains, and indeed social innovation is becoming increasingly evident in policy, scientific and public debates (see e.g. The Economist Intelligence Unit, 2016). A social innovation can be defined as a new combination of social practices, which is prompted by certain actors in order to better respond to needs and problems and diffused throughout society (Howaldt & Schwarz, 2010).

But social innovation studies and practices have emerged largely outside the field of innovation studies, and it is acknowledged that we are still lacking conceptions of social innovation in both research and practice. The challenge for science and policy is developing a theoretically sound concept of social innovation beyond the empirical and policy domains in which it is popularised, across a range of different policy areas, research fields and regional perspectives.

There is now a considerable body of evidence exploring this diversity of policy areas and regional perspectives, led not least by the European Commission who have invested heavily in research in this area (including SI-DRIVE, TRANSIT, CrESSI or SIMPACT).

Comprehensive approaches to innovation policy, supporting both technologies and new social practices, remain in their infancy. We contend a new model for innovation policy is needed that supports both technological and social innovations and creates framework conditions for developing systemic solutions. Many potential social innovations are hindered by traditional approaches in public policies alongside various barriers (financial, legal, institutional etc.) that could be addressed through public policy. But what makes it difficult for the necessary policy innovation to develop rules and regulations supportive of social innovation is precisely the fact that “social innovation” has emerged as an activity disconnected from the mainstream.

This conceptual differentiation between social and technological innovation requires above all a deeper understanding of the principles and modes of action of social innovations and their relations to and embedding in technological innovations. The systemic perspective on innovation, an important achievement of Innovation Studies, provides new coherent visions of social innovation beyond its current sector-specific and actor-centred approaches. Technology Assessment perspectives would likewise help in bringing a differentiated perspective towards the ambivalence of social innovations, where analyses are often dogged by an implicit normative belief in the moral goodness of these social changes.

This research session aims to further this dialogue within Innovation Studies and seeks for contributions to this debate, potentially addressing one or more of the following questions:

- How can the area of social innovation benefit from the experience of Innovation Studies?
- How are social and technological innovations intertwined and what does it mean for innovation policy, also regarding designing new policy instruments?
- To what extent do social and business innovations interact? In which ways do these various innovation processes affect each other?
- How can we shape or govern social innovation to move towards social transformation?

- What is the role of universities and research institutions in developing social innovations and which new forms of policy advice can be introduced?
- How can the innovation potential of societies be used and which concepts and methods can be developed and applied to support social innovation, especially considering the changing relationship between citizens, researchers, policy decision-makers and other stakeholders?
- What kinds of policy interventions are needed to foster social innovation ecosystems, also considering new innovation systems concepts, and which governance models are becoming increasingly important?
- Social innovation as an autonomous policy area or as a part of a comprehensive innovation policy: What are the (dis)advantages of both approaches?

References:

- Cagnin, C.; Amanatidou, E.; Keenan, M. (2012). Orienting European innovation systems towards grand challenges and the roles that FTA can play. In: *Science and Public Policy* 39 (2), pp. 140–152.
- Fagerberg, J.; Mowery, D.C.; Nelson, R. R. (Ed.) (2005). *The Oxford handbook of innovation*. New York: Oxford University Press.
- FORA (2010). *New Nature of Innovation*. Report to the OECD. Copenhagen, https://www.tem.fi/files/24835/New_Nature_of_Innovation.pdf, last access on 08th of July 2015
- Howaldt, J.; Schröder, A.; Kaletka, C.; Rehfeld, D.; Terstriep, J. (2016). *Mapping the World of Social Innovation: A Global Comparative Analysis across Sectors and World Regions*. A deliverable of the project: “Social Innovation: Driving Force of Social Change” (SI-DRIVE).
- Howaldt, J.; Schwarz, M. (2010). *Social innovation: Concepts, research fields and international trends*. IMO international monitoring. Aachen: IMA/ZLW & IfU – RWTH Aachen University.
- Kallen, H. (1932). *Innovation*. In E. R. Seligman, & A. Saunders Johnson (Eds.): *Encyclopaedia of the Social Sciences* (pp. 58–61). New York, London: Macmillan Publishers.
- Ogburn, W. (1966). *Social Change with Respect to Culture and Original Nature*. Oxford (UK): Delta Books [1st edition 1922].
- Schumpeter, J. A. (2006). *Theorie der wirtschaftlichen Entwicklung*. Reprinted 1st ed. 1912. Berlin: Duncker & Humblot.
- Tarde, G. (1903). *The Laws of Imitation*. New York: Henry Holt and Company.
- The Economist Intelligence Unit (2016). *Old problems, new solutions: Measuring the capacity for social innovation across the world*. An Economist Intelligence Unit study.

TRACK 9: Nexus Governance: Rethinking the Governance of Large Technical Infrastructures

Session Proposers:

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Description:

Growing demands for the global provision of food, energy and water through large socio-technical infrastructures are generating strategic challenges for communities, businesses and governments alike. We refer to the management and resolution of these challenges as 'Nexus governance'. In this session, we will explore the way science, technology and political processes, both formal and informal, are crucially intertwined, and so influence sustainable development outcomes.

We will share a number of cases from different parts of the world that examine how nexus interactions emerge and are governed in different settings. Examples range from technologies allowing the global exchange of information and communication in real-time, mobility of persons and goods as well as production and distribution of electricity and other energy forms. In most OECD countries the construction of these infrastructures however tends to become engulfed into conflicts time and again. This holds true for technologies such diverse as renewable energy plants (e.g. windmills, solar, biogas), conventional power plants (e.g. nuclear, coal), power lines, railroads, railway stations and airports.

Citizens often complain about sight, sound and smell nuisance caused by (the construction of) new infrastructures. In addition, risks are regularly an issue, as for example in the case of cellular phone technologies, high-voltage power lines and nuclear power plants. Finally, home owners are concerned about the diminished value of their properties after a new infrastructure has been built. In the debate around large technical infrastructures, it is often insinuated that "Not-In-My-Backyard" stances (NIMBY) are the prime explanation for resistance against new infrastructures. More recent research however shows that this in fact is not true and that NIMBYism frequently is used by supporters of new infrastructures to discredit protesters (Devine-Wright 2011, Wolsink 2012).

This presents fundamental challenges for how to facilitate transitions to sustainability, as envisaged by the Sustainable Development Goals. In turn, this requires rethinking the relationships between science, technology and innovation in resource management, as well as the institutional arrangements and practices required. This goes beyond standard state-centred regulatory responses to a wider set of socio-technical and political arrangements known from decades of enquiries that have more specifically question the provision of bio-resources through research, innovation and value chain management.

- Mono-disciplinary, single-sector and state-led approaches are clearly insufficient, but what should be in their place?

- How STI policies should or could address the nexus governance challenges in a state of transition?
- What are the major factors at work with these conflicts? Are conflicts determined mainly by Not-In-My-Backyard thinking or other considerations?
- Can we learn from research regarding the acceptance of technologies or on the governance of technological risks?
- What are the critical issues in the governance of large technical infrastructures?
- Are there processes and instruments which are more promising than the ones currently employed?
- How can decisions on new infrastructures become more democratic, more acceptable and more sustainable?

Illustrated by the case studies or theoretical reflections to be presented in the session, we argue that transformative changes in framing, organisational arrangements, structural and institutional dynamics, and social-technical innovations for sustainability transitions are required. The focus will extend to collective, transversal system innovations and social movement encounters, rather than only on hierarchical forms of governance and knowledge production, including ways of challenging standard scientific-technical frameworks and historically-rooted incumbent regimes, and the roles of knowledge intermediaries and brokers in facilitating transition.

The session favours contributions that reflect on the coupling of STI policies and Resources policies in order to pay attention to incumbent limitations of harnessing sustainable transitions through sectorial knowledge and innovation systems. Case studies that examine nexus governance of water, food and energy, and their interactions are welcome, from any region of Europe or elsewhere. The session encourages contributions that pay particular attention to the challenge of transitions to sustainability and the processes of collective action, citizen mobilisation, state-business interaction and public policy making that influence governance. Paper proposals addressed at problems of governing large technical infrastructures are welcome and may focus on problem finding/agenda setting, decision finding/planning, decision making, implementation, evaluation or termination of policies.

References:

Allouche, J., et al. (2015). Technical veil, hidden politics: Interrogating the power linkages behind the nexus. *Water Alternatives*, 8(1), 610-626.

Bäckstrand, K. (2003). Civic science for sustainability: reframing the role of experts, policy-makers and citizens in environmental governance. *Global Environmental Politics*, 3(4), 24-41.

Barbier, M., et Elzen, B. (2012). *System innovations, knowledge regimes, and design practices towards transitions for sustainable agriculture*. Paris : INRA.

Beddington, J. (2009). *Food, Energy, Water and the Climate: A Perfect Storm of Global Events?* Government Office for Science, London.

Borrás, S. and J. Edler (2014). "On Governance, Systems and Change". In: *The Governance of Socio-Technical Systems: Explaining Change*. Borrás, S. and J. Edler (Eds). Cheltenham, UK, Edward Elgar.

Devine-Wright, P. (Ed.) (2011): *Renewable Energy and the Public. From NIMBY to Participation*. London, Earthscan.

Edler, J., Kuhlmann, S., & Behrens, M. (Eds.). (2003). *Changing governance of research and technology policy: the European research area*. Edward Elgar Publishing.

Hoppe, R. (2005). Rethinking the science-policy nexus: from knowledge utilization and science technology studies to types of boundary arrangements. *Poiesis & Praxis*, 3(3), 199-215.

Kuhlmann, S., & Edler, J. (2003). Scenarios of technology and innovation policies in Europe: Investigating future governance. *Technological Forecasting and Social Change*, 70(7), 619-637.

Loconto, A. et al. (2016). *Innovative markets for sustainable agriculture: How innovations in market institutions encourage sustainable agriculture in developing countries*. Rome: Food and Agriculture Organization of the United Nations

Scoones, I., Leach, M. and Newell, P. (Eds) (2015). *The Politics of Green Transformations*. London: Routledge.

Smith, A., Stirling, A., & Berkhout, F. (2005). The governance of sustainable socio-technical transitions. *Research policy*, 34(10), 1491-1510.

Wolsink, Maarten (2012). "Wind Power: Basic Challenge Concerning Social Acceptance." In: *Encyclopedia of Sustainability Science and Technology*, R. A. Meyers (Ed). New York, NY. Springer New York: 12218-12254.

Zed Books. Smits, R., & Kuhlmann, S. (2004). The rise of systemic instruments in innovation policy. *International Journal of Foresight and Innovation Policy*, 1(1-2), 4-32.

TRACK 10: Innovation Ecosystems – a Governance Challenge for Companies and Policy Makers?

Session Proposers:

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Description:

Innovation system concepts have become a major reference for innovation policy and proven to be a useful lens for capturing features of innovation processes which transcend the boundaries of innovating organizations, such as institutions or networks. Innovation system concepts have been used to analyze innovation dynamics and the specific conditions for innovation at national or sectoral levels, or in particular technology fields. In doing so, they have been productive for deriving innovation policy approaches (Wieczorek & Hekkert 2012; Smits et al. 2010a; Smits & Kuhlmann 2004).

While these concepts are useful for capturing systemic features at highly aggregated levels, they are arguably less tuned towards capturing the dynamic evolution of innovation systems (Smits et al. 2010b) and how the organizations within an innovation system make use of and interact with this system in their innovation processes and strategies, or how they actively contribute to shaping these systems (for exceptions see Planko et al. 2016; Musiolik & Markard 2011). Empirical research shows that companies cannot typically manage the challenges of adapting new technologies, introducing innovations, establishing and sustaining business interrelations, and maintaining competitiveness using just internal resources and capabilities. Companies are systematically shaping their innovation environment to improve innovation capabilities and processes (Coombs and Georghiou, 2002). These interactions are both directional, such as creating more or stronger co-operations, and reactionary responses to environmental change or changing positions within an innovation value chain, which create new system boundaries e.g. insourcing specialised innovation activities.

The concept of an innovation ecosystem (IES), which emerged from the innovation management literature (Autio & Thomas 2014; Adner & Kapoor 2010; Moore 1993), has received increasing attention because of its potential to addresses system-level phenomena from a company perspective, respectively the interface between companies and 'their' innovation (eco)system. This idea pays particular attention to the flows of money, knowledge,

people and services between organizations, to identify interdependency, as in a biological ecosystem.

“The added value of thinking of this system as an ecology is the focus it brings to the distribution and abundance of research performers and knowledge and their interactions with each other and the broader environment.” (European Commission 2008: 23)

A company’s innovation ecosystem (IES) is not limited to an industry sector or specific region as implied by concepts such as sectoral, regional innovation systems or clusters (Malerba 2002; Braczyk, et al., 1998, Porter 1998), or to a particular technology as implied by the technological innovation system concept (Carlsson and Stankiewicz 1991). It is comprised of all the contacts and inter-linkages to other organizations around specific products or technologies, and thus companies may have to manage and manoeuvre within multiple or overlapping innovation ecosystems. The innovation process involves suppliers and customers but also competitors or universities, investors and policy actors, each of whom may control important resources or dependencies in a specific IES. This perspective has new implications for Governments, whose policy concerns will encompass the stability/change in populations and configurations of actors within IES’; facilitating interactions across sectors, geographies and value chains; ensuring effective flows of ecosystem resources, and addressing systemic imbalances.

We invite contributions which discuss conceptually or empirically:

- Strategies: the ways that innovating organizations strategically mobilize their innovation environment and/or try to shape it as part of the innovation process and/or anticipate the future environment.
- Ecosystem change: how do ecosystems change? What strategies can companies and governments use to respond to or induce ecosystem change?
- Concepts: what are the conceptual merits and shortcomings of the IES concept? How does the concept relate to other innovation system concepts?
- Governance and policy implications: how are innovation ecosystems governed and by which actors? What is the role of policy-makers within innovation ecosystems and what are the approaches and policy instruments for supporting and directing innovation within IES? How is the tension between the diverging boundaries of often international and highly dynamic innovation ecosystems, and national and regional innovation systems and policy frameworks, and how may policy address this challenge?

References:

Adner, R. and R. Kapoor (2010). Value creation in innovation ecosystems: How the structure of technological interdependence affects firm performance in new technology generations, *Strategic Management Journal* Vol.31 No.3 pp. 306-333.

- Autio, E. and L.D. Thomas (2014). Innovation ecosystems; Implications for innovation management, in: Dodgson, M., Philips, N. and D.M. Gann (Eds.), *The Oxford handbook of innovation management*, Oxford: Oxford University Press, pp.204-228.
- Braczyk, H.-J., P. N. Cooke, M. Heidenreich (1998). *Regional Innovation Systems: The role of governance in a globalized world*. London: UCL Press.
- Carlsson, B., and R. Stankiewicz, (1991) On the Nature, Function and Composition of Technological Systems. *Journal of Evolutionary Economics*, 1(2): 93-118.
- Coombs, R., and L. Georghiou, (2002). A New Industrial Ecology. *Science*, 296: 471.
- European Commission (2008). *Challenging Europe's Research: Rationales for the European Research Area (ERA)*, EUR 23326 Luxembourg: Office for Official Publications of the European Communities.
- Malerba, F. (2002). Sectoral systems of innovation and production. *Research Policy*, 31: 247-264.
- Moore, J. F. (1993), *Predators and prey: A new ecology of competition*, *Harvard Business Review*, Vol.71, pp.75–86.
- Musiolik, J., J. Markard, (2011). Creating and shaping innovation systems: Formal networks in the innovation system for stationary fuel cells in Germany. *Energy Policy*, 39: 1909-1922.
- Planko, J., J. Cramer, M. P. Hekkert and M. M. H. Chappin (2016). Combining the technological innovation systems framework with the entrepreneurs' perspective on innovation. *Technology Analysis & Strategic Management*: 1-12.
- Porter, M. (1998). Clusters and the New Economics of Competition. *Harvard Business Review*, 76(6): 77-90.
- Smits, R., S. Kuhlmann and P. Shapira (2010a). *The theory and practice of innovation policy: An international research handbook*. Edward Elgar: Cheltenham.
- Smits, R., S. Kuhlmann and M. Teuball (2010b). A system-evolutionary approach for innovation policy. *The Theory and Practice of Innovation Policy: An International Research Handbook*: 418-448. Edward Elgar: Cheltenham.
- Wieczorek, A. J. and M. P. Hekkert (2012). Systemic instruments for systemic innovation problems: A framework for policy makers and innovation scholars. *Science and Public Policy* 39(1): 74-87.

TRACK 11: Public-Private Partnerships in Research and Innovation: State of Play and Ways Ahead

Session Proposers:

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Description:

Public-private partnerships in research and innovation (PPPs in R&I) have become a key element in the research and innovation policy mix in many advanced economies, in Europe and elsewhere. The term PPPs in R&I has been used as a broad header for collaborative arrangements between private and public institutions already since the 1980s. Policy instruments to stimulate PPPs in R&I have evolved over time and transformed themselves to meet the changing challenges of our time. Recent years have witnessed a renewed interest in PPPs, not only at the European policy level with large size PPPs in R&I such as the JTIs and the EIT KICs entering the stage during the late 2000s, but also at national level where new policy instruments and new PPP practices – in terms of virtual or ‘physical’ collaborations – have been or are being designed and introduced (see for instance Austria with the COMET programme, Germany with the “Forschungscampus” and the Netherlands with the Topsectors Policy). New modern flexible PPP formats are arising with entry and exit being organized in new ways and intellectual property arrangements are presented in an ‘a la carte’ type of way. Moreover, the coverage of PPPs has been broadened and extended to include also the higher end of the TRL (technology readiness level) scale – or ‘experimental development’ in state aid framework terminology. Typically such PPPs are intended to boost the development of existing and new innovation ecosystems and meant to offer testing and experimenting platforms for SMEs and startups, with the objective to help breed the scaleups of tomorrow. But also in the lowest TRLs - in basic research – we observe new developments, with large PPPs in R&I taking on a key role in the search for solutions to societal challenges, multidisciplinary, high risk endeavours usually requiring high investment.

The aim of the research session is to explore and highlight new directions and arrangements for PPP in R&I, with the choice for track participants to take one of two following distinct different perspectives: i) the policy instrument perspective, ii) the PPP governance perspective (design and functioning of one or more ‘real-world’ PPPs in practice), or iii) the regional perspective. The first – policy instrument - perspective applies to the rise of new policy instruments in PPP in R&I, which are built on or around triple or quadruple helix notions, involve new creative ways of financing and pool and secure resources in a longer term collaboration on a certain theme, topic or challenge. It seeks to explore, analyse and/or compare different policy instruments, with an emphasis on new challenging and/or experimental ways of collaborating in a public-private setting. Possible questions could be: how to incentivize and stimulate PPPs from a policy perspective? Where do PPPs for R&I and societal challenges meet? Whether and how to align European and national PPP in R&I policies? Do we need another generation of PPP instruments in times of deglobalisation, EU skepticism and fragmentation? The second – PPP governance - perspective looks at ways and modes of how PPPs in R&I can be governed and managed in practice (‘real-world’),

focusing on smart partnership arrangements in terms of knowledge production during the course of the PPPs existence, the handling of intellectual property, and its smooth, effective and efficient collaboration. The governance perspective can either take the form of an individual (1 to 3) case studies comparison or take a broader, encompassing form in which different governance types are compared, quantitatively or qualitatively, or a combination of both. Possible questions could be: what form could/should a PPP take (virtual organization, 'physical' institute) vis-à-vis its goals and expected impact? How to retain flexibility and continuity of a PPP in the course of time? To what extent is IP a leading principle in the design of PPPs in R&I? The third perspective puts emphasis on the regional implications of PPPs in R&I, with questions relating to the impact of PPPs in R&I on strengthening regional technological competitiveness, their contribution to strengthening the regional research and innovation profile, and their possible role as R&D service provider for companies in the region. The regional perspective can take the form of a comparative case study or analysis using quantitative indicators.

The approach taken by track participants is in principle free, although a rigorous individual or comparative case study methodology involving appropriate qualitative or quantitative methods/techniques or a combination thereof is preferred. This applies to both the policy perspective (policy / institutional / economic analysis), the governance (innovation management), and the regional perspective. Theoretical underpinnings, such as neo / new institutional economics, transaction cost economics, behavioral economics, policy sciences, regional science, etc., might add to the value of the contributions. Contributors are invited to use performance, structural as well as input and output indicators/variables, depending on the nature and purpose of their particular research at hand.

Expected outcomes (in scientific and policy terms) to be achieved

- An up-to-date overview of and insight in recent approaches and practices towards PPP in R&I, both in terms of policy-making and in the governance of PPPs in R&I
- An increased insight and understanding of which PPP in R&I governance constructs arrangement work best (and which do not) in which domains/sectors, in which institutional context and under which circumstances/conditions
- An increased insight and understanding of which PPP in R&I policy instruments work best (and which do not) at which level (European, national, regional) and under which circumstances/conditions
- An increased insight and understanding of how PPP in R&I approaches impact the regional level (European - national - regional linkages, competitiveness, innovation performance)
- The generation of new ideas and new conceptual approaches to PPPs R&I for:
 - Approaching and solving grand societal challenges
 - Coping with/in a changing world of deglobalisation, fragmentation and populism
 - Addressing European competitiveness and societal needs
 - Messages and recommendations to policy-makers, industry, universities and RTOs to improve the design and performance of PPPs in R&I now and in the near future.

References:

De Heide, M., M. Butter and L. Seiffert (2016) The financing of fieldlabs in the Netherlands. Delft: TNO

European Commission (2013) Final assessment of the research PPPs in the European Economic Recovery Plan. Luxembourg: Publications Office of the European Union

Koschatzky, K./Stahlecker, T. (eds.) (2016): Public-private partnerships in research and innovation: Trends and international perspectives. Stuttgart: Fraunhofer Verlag.

Koschatzky, K./Kroll, H./Meyborg, M./Stahlecker, T./Dwertmann, A./Huber, M. (2015): Public-private partnerships in Research and Innovation - Case studies from Australia, Austria, Sweden and the United States (= Working Papers Firms and Region Nr. 2/2015). Karlsruhe: Fraunhofer ISI.

OECD (2014) Strategic Public/Private Partnerships in Science, Technology and Innovation. Final Report, 2 December 2014. Paris: OECD

Stahlecker, T.; Kroll, H. (2012): The cluster concept as a multi-dimensional thematic field: Methodological and substantive perspectives (Working Papers Firms and Region No. R3/2012, Fraunhofer Institute for Systems and Innovation Research, Karlsruhe)

Stahlecker, T. (2012): Regional clusters and disruptive technologies – The example of the Baden-Württemberg automotive cluster in transition towards e-mobility, in: Fraunhofer ISI (ed.) (2012): Innovation system revisited – Experiences from 40 years of Fraunhofer ISI research. Fraunhofer Verlag, pp.: 193-216.

Van der Zee, F.A. van der (ed.), A. Goetheer en G. Gijsbers (2016) De Staat van Nederland Innovatieland 2016. Publiek-Private Samenwerking in Onderzoek en Innovatie. Delft: TNO (book, in Dutch)

TRACK 12: Open Track

The Open Track covers a broad spectrum of research questions, but with a specific emphasis on future challenges for STI policy research. The following topics are encouraged:

The future of science – society relations

- Responsible research & innovation – new concepts, experiences and policies
- New forms of participation in the governance of science and technology
- Citizens, scientists, industry and policy-makers: the role of different stakeholders in STI policy making
- Gender-specific policies as drivers of Science, Technology and Innovation

The challenges of globalized knowledge production

- Knowledge production between global networks and local skills
- The future of collaborative R&I: New arrangements between private and public institutions
- New forms of entrepreneurship and pathways for firm growth
- Globalized knowledge production and economic development

Digital science and innovation

- New institutional frames for digital science
- The future of science 2.0 and policies towards digital research
- ICT-enabled innovation in manufacturing and services

New concepts for STI policy

- New innovation system concepts
- Agency and entrepreneurship in STI policy making
- Transformative STI policy
- Transformative innovation in mature industries
- Smart STI-policies for manufacturing SMEs

The governance of STI policy – new players, new processes, new instruments

- STI policies and new patterns of innovation: Social Innovation, Open Innovation, User Innovation, Frugal Innovation
- New mission-oriented STI policies: Triggering foundational breakthrough research at the service of society
- Policy coordination and next-generation policy instruments
- New forms of STI policy advice

New indicators and approaches for assessing the impact of STI policy

- Measuring the dynamics of STI systems
- Beyond established STI policy evaluation and impact assessment methods
- Modelling STI system dynamics