



The Roles of Experimentation in Transformative Innovation Policy

TIPC Research Brief

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Summary

This research brief examines the various practices, rationales and methods associated with policy experimentation, to respond to how policymakers can engage with experimentation to advance Transformative Innovation Policy (TIP) for Transformative Change. This briefing argues for the adoption of expansive understanding of experimentation and examines five different *Experimental Policy Engagements* (EPEs). It concludes with a reflection of how the Transformative Innovation Policy Consortium may support the emergence of novel EPEs suitable for the pursuit of transformative change.

Introduction

The Transformative Innovation Policy Consortium (TIPC) is embarking on a 5-year programme, which aims to advance policy practice and research aligned with the emerging framing of innovation policy for transformative change¹. This framing demands substantial experimentation, which is justified by three observations.

First, existing policy instruments developed according to the rationales of the first and second frames of innovation are largely not suitable for promoting transformational policies. New instruments need to be conceived, and existing ones need to be developed further². From experimentation in the context of research and development, as prevalent in Frame 1, or as a means for developing new products and services, as in Frame 2, experimentation emerges as a prominent tool for fomenting system change.

Second, transformations are long, complex, open-ended processes which involve multiple stakeholders and where visions, expectations and problem-framings ought to be reassessed on an ongoing basis, reviewed under the light of new evidence, novel technologies and practices³. These processes demand social-learning: stakeholders discovering ways of working and being, new values and routines, which arise from practical experiences and henceforth, some degree of experimentation.

Third, transformations have a necessarily normative character, forcing questions of what the transformation should be for, and who should carry it out⁴. Technology and policy interventions are not neutral in and of themselves, in that they favour or

disfavour interests. Experimentation can hence play a role in facilitating the design, appraisal and the enactment of different alternatives⁵.

Departing from these observations, this research brief outlines the findings of a scoping exercise on policy experimentation conducted in preparation for that endeavour, addressing the question of how can policymakers engage with experimentation to enable Transformative Change.

The interest in experimentation is not unique to TIPC. Recently, it has surged in various areas of management, public policy and environmental governance, to name a few. The increasing prominence of lean experimentation⁶ in start-up culture, the spreading of innovation policy labs⁷, the growing influence of the design discipline on rationales of policy making⁸, and societies increasingly 'experimenting with themselves'. As such, a complex new lingo is emerging, borrowing from terms, approaches and methods from medicine (e.g. randomised control trials), design (e.g. design thinking, rapid prototyping) and engineering (e.g. pilots, stress tests). In regard to policy, this contemporary interest for experimentation builds on earlier attempts at developing robust methods for determining 'what works' in policy making and builds on long-standing debates about evidence based policy.

Traditionally, policy experimentation has aimed at assisting decision making, confirming hypothesis and providing evidence for justifying decisions. A variety of definitions have been proposed. They can be summed up as:

A diverse set of practices, methods and rationales aimed at intentionally generating practical learning opportunities for informing, enabling and advancing processes of policy learning and policy change, which may be targeted at policy formulation and implementation, and operate at the level of instruments, programmes or portfolios (policy mixes).

However, even such an expansive definition ignores the fact that policymakers already engage with experiments 'outside' the purview of traditional policy formulation, or that increasingly interventions themselves are framed as experiments. It would be unhelpful to assume that the only valuable experiments are

initiated by policymakers when a variety of stakeholders is implicated, and when there are many learning opportunities from which to derive social learning. Further, it would be misleading to assume that experiments are all rigidly bound when in effect these processes tend to be open ended and flexible⁹. For that reason, at TIPC, it is preferable to focus on advancing *Experimental Policy Engagements* (EPEs):

The diverse ways in which policymakers engage with processes of experimentation, initiating, supporting or mobilising such initiatives for informing decision-making, enabling processes of social learning, developing alternatives pathways and enacting desirable futures.

As the scope of application and the diversity in approaches expanded in recent years, it is important to examine the assumptions which underpin the umbrella term of experimentation and to critically assess how they play out in policy making. Many academic disciplines and policy traditions refer to experimentation, sometimes relying on incongruent understandings. Researchers have a role in pushing the boundaries of existing engagements, opening new avenues, and clarifying the usages and caveats of these engagements to avoid subsuming all forms of experimentation to specific methods or conflating distinct approaches. Meanwhile, policymakers may find in this exercise a pallet of options for addressing their challenges and contribute to developing new means of policy action. Regrettably, the academic and policy insights are often kept apart. Considering that the Transformative Innovation Policy Consortium brings both together with a spirit of co-creation, it is the perfect setting for forging new understandings about emerging experimental policy engagements and their contribution to transformative innovation. With this objective in mind, this briefing:

- Presents five relevant modes of Experimental Policy Engagements
- Discusses the TIPC approach to experimentation

Five modes of Experimental Policy Engagements

Early on, producing ‘scientific evidence’ for informing decisions about ‘what really works’ was a key motivation for those arguing for experimental practices. Since the

early 20th century, economics and psychologists (in the case of education policy) leading the advocacy for structured attempts to experiment with policy design. Under this conception of experimentation, the crucial task was one of hypothesis testing, checking the validity of the assumptions underpinning the policy design, measuring and evaluating the outcomes of policies, and improving effectiveness by adjusting the instruments' parameters ('calibrating instruments'). For that to be possible, the experimental procedures deployed would attempt to establish control over the context of application, isolating the effects of policy from other effects and seeking to compare groups which received the 'policy treatment'. Hence, a sophisticated methodological tradition has developed to support this form of experimentation, deriving from methodologies associated with medical trials and sustained by a renewed emphasis on 'evidence-based policy'.

Accordingly, Randomised Control Trials (RCTs) have gained prominence in various fields: they require applying the intervention (treatment) to randomly selected groups, and controlling other factors, would allow establishing statically sound evidence of the effects of a determinate (policy or medical) treatment. The promise of a scientifically based, systematic way of assessing policy options have led many to argue that RCTs are the 'Golden Standard' in the production of evidence-based policy, but that promise has now many critics, as it may narrow the forms of evidence and learning which are considered in policy making. Too often, such methodologies are used to determine whether an intervention works, but not to understand why it works and in what ways it may work in different contexts¹⁰.

[RCTs] cannot automatically trump other evidence, they do not occupy any special place in some hierarchy of evidence, nor does it make sense to refer to them as 'hard' while other methods are 'soft.'¹¹

Therefore, when considering the prospect of 'policy design experiments', RCTs should not be assumed to be the sole suitable method. The question is not what method is the universal gold standard for informing policy decisions, but instead what are the best approaches to generate the forms of learning to address a particular challenge.

Moreover, considering the complexity and scope of transformation, it is necessary for experimentation to go beyond the design of instruments, and to focus on the make-

up and functioning of policy mixes. Transformations often involve a multiplicity of instruments, goals and process that are distributed among various departments, and require the engagement of actors beyond policymakers, across multiple levels of governance or geographies¹². To redress this issue, policy analysts have studied how to develop and make work policy mixes (also referred to as portfolios). Because of their complex nature, policy mixes may suffer from lack of consistency between instruments, lack of coherence between policy goals, lack of comprehensiveness, and problems of legitimacy¹³. The introduction of policy instruments rarely takes place on a blank slate; instead, new policy instruments are often layered on top of pre-existing instruments, hence interacting in complex ways with other instruments, and potentially generating tensions around rationales, goals and implementation strategies¹⁴. These complex interactions defy the notion of control assumed in policy design experiments; they are nonetheless crucial for the success of the policies. If unchecked, this 'layering' can lead to drift in the core goals of the policy mix, hence reducing its effectiveness. Moreover, pre-existing policies might have created constituencies which would support or oppose policy change (as in the case of subsidies), generating feedbacks which may induce path-dependency¹⁵, and obstructing attempts to alter the direction of policy and generating a disruptive political backlash. These feedbacks are of importance in sustainability transitions, where policy mixes require a combination of instruments supporting alternative technologies and removing the support of incumbents¹⁶. Policies with a transformational aim might face stark opposition from incumbents who benefit from pre-existing policies¹⁷.

Rather than trying to answer once and for all what policies or mixes should be implemented, we should be stimulating and supporting an open and ongoing debate about which policies could be implemented and how, and about the inevitable trade-offs and tensions between means and ends in the constantly evolving policy mix for innovation.¹⁸

Another mode of experimental policy engagements can assist this 'open and ongoing debate'. Besides experimenting with the design of policy instruments, experimentation may thus contribute to steering the direction policy mixes; exploring alternatives for patching existing policy mixes; revealing the tensions and trade-offs between instruments; probing policy feedbacks and political responses; giving form

and voice for new alliances supportive of policy changes. Unfortunately, this mode of Experimental Policy Engagement remains underdeveloped in the policy mixes literature. TIPC research may contribute to redressing this gap.

Thirdly, policymakers are increasingly engaged in generating interventions which are themselves experimental, and which have explicit transformational objectives beyond the formulation of new policies. This is the case of a growing number of Urban Living Labs¹⁹ for example, where the intervention consists of setting up an experimental space, forming a constituency around it and nourishing a variety of experiments. Similarly, practitioners of transition management²⁰ have been developing an approach for setting up 'transition arenas', hosting groups of stakeholders with the aim of envisioning a transformation, defining key experiments and seeking to strengthen and scale them up. Both living labs and transition arenas have been extensively applied in urban settings. By creating designated spaces, where a variety of social actors can interact and try out different ideas, rationales and technologies, policy actors can induce deep learning about the issues at hand, and foment creative responses which would usually be excluded.

However, there is no reason why EPEs should remain limited to forms of experimentation initiated by policymakers as other stake holders are also engaging with the search for appropriate responses to societal challenges. In effect, entrepreneurial experimentation, grassroots initiatives, social moments can all play a role in exploring issues, proposing solutions and developing alternatives. A key EPE, therefore, consists of efforts for supporting existing experiments brought about by other actors, and intermediaries who help to articulate such initiatives²¹. Various governments are seeking to develop platforms which support specific experiments and provide different degrees of intermediation for the concertation of multiple experiments. To inform these activities, policymakers can make recourse to Strategic Niche Management (SNM)²², an approach that emerged in the late 1990s. This approach diagnoses that radical technologies and practices are often confronted with unfavourable conditions, as they are ill-adapted to existing markets, user expectations and regulations, industry composition and infrastructures. Moreover, to become functional and competitive, the proponents of such innovations need to learn how to develop viable new sociotechnical configurations, for which experimentation play a critical role. To be able to develop, they necessitate protective spaces, or

niches, where experimentation and learning can occur. SNM demonstrates that policymakers can take a proactive role in identifying emerging sociotechnical configurations and supporting the experimentation. The approach has a wealth of information about the processes implicated in niche formation, and about the role of intermediation, which also inform the Transition Management approach.

Finally, many commentators have noticed the emergence of an experimental governance or experimental culture, suitable for governing areas which involve substantial uncertainty and 'wicked' problems. This mode of engagement is presented as a response to issues associated with disruptive technologies and rapidly evolving markets, as with the case of digital technologies, but is particularly salient in efforts for tackling climate change, both for mitigation and adaptation, and building resilience²³, notably at the urban scale²⁴. Climate change is associated with uncertainty on many levels, as it implies surprises (e.g. extreme events), counterintuitive effects (e.g. rebounds effects where overall emissions increase despite gains of efficiency), and teleconnections (e.g. water shortages due to far away deforestation), which limit the predictability of future climate. It also involves substantial ambiguity; there is a multiplicity of alternatives for responding to the challenges of mitigation and adaptation, with different implications and beneficiaries. Uncertainty, ambiguity and dynamic contexts may overwhelm conventional planning strategies or management approaches, which rely on notions of risk management to address uncertainty.

Hence, emerging governance approaches such as reflexive²⁵ and adaptive governance place experimentation as a central means for governing, not just as a useful tool for policy design. Here, the fifth mode of experimental policy engagement may provide the learning required for the reflexivity and adaptation. The intentional and mindful learning-by-doing of experiments is then extended to other forms of policy action, understood as opportunities for developing alternatives and for enacting potential futures. Despite the academic interest, and the body of work on adaptive and reflexive governance, this mode of engagement is nevertheless underdeveloped.

In every case, Experimental Policy Engagements are not devoid of politics. They do not involve only technical processes, even when drawing inspiration from scientific procedures, as in the case of RCTs. Framing an activity as experimental suggests

that it will be subject to a distinctive set of rules, procedures and conditions. By setting the boundaries of experiments, its proponents are defining who benefits and who experiments, and whose perspective count in the learning processes ahead. Without a doubt, establishing such engagements may create tensions between those involved and those who are left out from experiments. Moreover, those different Experimental Policy Engagements are meant to enable the development of visions of how a system could work differently. As such, the proponents of these engagements need to demonstrate the capacity and legitimacy for negotiating and aligning the expectations of different actors, facilitating complex processes of participation. TIPC may help establish a reflexive practice and collaborative environment for supporting the development of such capacities.

Summing up, the table below compares the five modes of experimental engagements which were presented in this research briefing. There are clear overlaps and complementarities between these different modes of Experimental Policy Engagements. To address an issue, policy-makers may make recourse to various engagements at different times. TIPC can work towards further developing the two modes which are still underdeveloped, and in developing its members' capacity for employing the whole pallet of engagements.

Modes of Experimental policy engagement	Policy design experiments	Experimentation within policy mixes	Creating experimental spaces	Supporting and connecting societal experiments	Experimental governance or Experimental cultures
<i>Role of experimentation in policy</i>	Assists in the formulation, calibration and justification of policy instruments	Assists in patching, and reorienting policy mixes, or in probing for political feedbacks	Creates dedicated environments and a constituency for experimentation.	Articulates existing experiments, facilitates learning and supports the development of networks.	Aims to develop flexible and proactive governance arrangements for emerging issues involving uncertainty, ambiguity and dynamic contexts.
<i>Actors involved</i>	Policymakers, and recipients of the policy treatment	Policymakers and policy analysts, stakeholders of the experiments	Lead users, entrepreneurs, technology advocates, designers, policymakers	Networks implicated in experiments, intermediaries and policymakers	As others, but with the aim at broadening participation to actors normally not involved in policy process
<i>Approaches</i>	Randomised Control Trial, Behavioural Experiments	Builds on the analysis of policy mixes and policy feedback Under development	Urban Living Labs, Transition Management	Strategic Niche Management	Builds on Adaptive and Reflexive Governance ideas Under development

Experimental policy engagements in the context of innovation policy for transformative change

As presented in this briefing, under a transformative innovation framing, experimentation takes an ample meaning: there is a demand for expanding the scope of experimentation and establishing new forms of engagement, hence moving beyond policy design experiments with well-established policy instruments. For that to be possible, TIPC should contribute to developing a new rationale, in which the analysis and practice move:

- From singular focus on improving policy instruments to a pallet of different Experimental Policy Engagements
- From creating opportunities for policy learning to enabling social learning
- From informing decision-making to enabling and the envisioning, design and appraisal of alternatives
- From first loop learning (improving instruments, optimising parameters, measuring impact) but second loop learning (changing routines, rationales, assumptions and problem framing)
- From tightly controlled experimental designs to adaptive and proactive experimental engagements which strengthen the relationship between stakeholders and build a constituency for change
- From assuming consensus to creating space for dissensus and democratic deliberation

The five-year programme on which TIPC is embarking presents a unique opportunity for co-creating these Experimental Policy Engagements. Redefining what is understood as policy experimentation is an essential first step for such journey. The notion of EPEs can help foster a dialogue between practitioners, researchers and policy-makers, enabling enhanced learning opportunities, and a new rationale well-suited for the challenges ahead. Experimenting with these new forms of policy action will also push research into new avenues to develop fresh methods to provide new insights in sociotechnical systems change.

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- ¹ For a review of the different framings, refer to Working Paper Schot, J., Stein Mueller, W.E., 2016. Framing Innovation Policy for Transformative Change: Innovation Policy 3.0 <http://www.johanschot.com/publications/framing-innovation-policy-for-transformative-change-innovation-policy-3-0/>
- ² Schot, J., Steinmueller, W.E., 2016. Framing Innovation Policy for Transformative Change: Innovation Policy 3.0 <http://www.johanschot.com/publications/framing-innovation-policy-for-transformative-change-innovation-policy-3-0/>
- ³ Grin, J., Rotmans, J., Schot, J., 2010. Transitions towards sustainable development. KSI-book series part I, Routledge Publishers, UK.
- Leach, M., Scoones, I., Stirling, A.C., 2010. Dynamic Sustainabilities, Dynamic Sustainabilities: Technology, Environment, Social Justice. Routledge. doi:10.4324/9781849775069
- ⁴ Scoones, I., Leach, M., Newell, P. (Eds.), 2015. The Politics of Green Transformations (Pathways to Sustainability). Routledge, London.
- ⁵ Bason, C., 2017. Leading Public Design: Discovering human-centred governance. Policy Press, Bristol.
- ⁶ Lean experimentation approaches aim at allowing start-ups to rapidly experiment with and validate crucial assumptions which underpin their business models to gaining insights and reiterate
- ⁷ Tonurist, P., Kattel, R., Lember, V., n.d. Discovering Innovation Labs in the Public Sector, Working Papers in Technology Governance and Economic Dynamics.
- Williamson, B., 2015. Testing Governance: the laboratory lives & methods of policy innovation labs. Stirling: University of Stirling.
- ⁸ Bason, C., 2017. Leading Public Design: Discovering human-centred governance. Policy Press, Bristol.
- ⁹ Hodson, M., Geels, F.W., Mcmeekin, A., 2017. Reconfiguring Urban Sustainability Transitions, Analysing Multiplicity. Sustainability 9, 20. doi:10.3390/su9020299
- ¹⁰ Cartwright, N., 2010. What are randomised controlled trials good for? Philosophical Studies 147, 59–70. doi:10.1007/s11098-009-9450-2
- ¹¹ Deaton, A., 2010. Learning about Development. Journal of Economic Literature 48, 424–455. doi:10.1257/jel.48.2.424, p.426
- ¹² Rogge, K.S., Reichardt, K., 2016. Policy mixes for sustainability transitions: An extended concept and framework for analysis. Research Policy 45, 1620–1635. doi:10.1016/j.respol.2016.04.004
- ¹³ Idem.
- ¹⁴ Howlett, M., Rayner, J., 2013. Patching vs Packaging in Policy Formulation: Assessing Policy Portfolio Design. Politics and Governance 1, 170–182. doi:10.12924/pag2013.01020170
- Flanagan, K., Uyarra, E., Laranja, M., 2011. Reconceptualising the “policy mix” for innovation. Research Policy 40, 702–713. doi:10.1016/j.respol.2011.02.005
- ¹⁵ Pierson, P., 2000. Increasing Returns, Path Dependence, and the Study of Politics. The American Political Science Review 94, 251–267.
- ¹⁶ Kivimaa, P., Kern, F., 2016. Creative destruction or mere niche support? Innovation policy mixes for sustainability transitions. Research Policy 45. doi:10.1016/j.respol.2015.09.008
- ¹⁷ Lockwood, M., 2015. The political dynamics of green transformations: The roles of policy feedback and institutional context. In Scoones, I., Newell, P., Leach, M. (Eds.) *The politics of green transformations*. London: Routledge.
- ¹⁸ Flanagan, K., Uyarra, E., 2016. Four dangers in innovation policy studies – and how to avoid them. Industry and Innovation 2716, 1–12. doi:10.1080/13662716.2016.1146126
- ¹⁹ Voytenko, Y., McCormick, K., Evans, J., Schliwa, G., 2016. Urban living labs for sustainability and low carbon cities in Europe : towards a research agenda. Journal of Cleaner Production 123, 45–54. doi:10.1016/j.jclepro.2015.08.053

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- ²⁰ Kemp, R., Loorbach, D., Rotmans, J., 2007. Transition management as a model for managing processes of co-evolution towards sustainable development. *International Journal of Sustainable Development & World Ecology* 14, 78-91. doi:10.1080/13504500709469709
- ²¹ van Lente, H., Hekkert, M., Smits, R., van Waveren, B., 2003. Roles of Systemic Intermediaries in Transition Processes. *International Journal of Innovation Management* 7, 247-279. doi:10.1142/S1363919603000817
- Kivimaa, P., 2014. Government-affiliated intermediary organisations as actors in system-level transitions. *Research Policy* 43, 1370-1380. doi:10.1016/j.respol.2014.02.007
- ²² Schot, J., Geels, F.W., 2008. Strategic niche management and sustainable innovation journeys: theory, findings, research agenda, and policy. *Technology Analysis & Strategic Management* 20, 537-554. doi:10.1080/09537320802292651
- ²³ Hoffmann, M.J., 2011. The World of Climate Governance Experimentation, in: *Climate Governance at the Crossroads*. Oxford University Press, pp. 27-58. doi:10.1093/acprof:oso/9780195390087.003.0002
- Kivimaa, P., Hildén, M., Huitema, D., Jordan, A., Newig, J., 2017. Experiments in climate governance – A systematic review of research on energy and built environment transitions. *Journal of Cleaner Production* 1-13. doi:10.1016/j.jclepro.2017.01.027
- ²⁴ Bulkeley, H., Castán Broto, V., 2013. Government by experiment? Global cities and the governing of climate change. *Transactions of the Institute of British Geographers* 38, 361-375. doi:10.1111/j.1475-5661.2012.00535.x
- Bulkeley, H., Castán Broto, V., Edwards, G.A.S., 2015. *An Urban Politics of Climate Change: Experimentation and the Governing of Socio-Technical Transitions*. Routledge, Oxon. doi:10.1017/CB09781107415324.004
- ²⁵ Voss, Jan-Peter, Dierk Bauknecht, and René Kemp (eds.). 2006. *Reflexive Governance for Sustainable Development*. Cheltenham: Edward Elgar.