



# Component 2: Experimentation for Transformative Innovation Policy

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## User guide

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Transformative Innovation Policy is informed by the notion that current social practices and technologies are unsuitable for shaping a sustainable and socially just future. A transformative approach is therefore necessary to change the directionality of the sociotechnical systems providing for our basic human needs.

However, with no blueprints for system change, we face ambiguities and uncertainties about the viability of alternatives. To discover these and effectively deploy them requires experimentation.

In ordinary usage, experiment is a scientific term that indicates a set of questions and method of investigation in a controlled environment that offers proven, reproducible results. Experiments in social and policy settings are, however, different and more complex. What lies in common is the ethos of exploration and of learning from failure.

Public officials are often cautious about describing their activities as experiments. Experiments can fail, they may be viewed as distractions from getting the job done, and questions of accountability may arise if experimental initiatives are conducted using public money. Yet, in the ordinary course of public office, policies and programmes often do not meet the expectations predicted at the outset, and may be regularly revisited and revised. In Transformative Innovation Policy, the term experimental policy engagement (or EPE) therefore captures not only the activity of experimenting with policy, but also the deeper intent to engage in a process and mindset of experimentation.

EPEs are interventions that may involve trying out a new, alternative policy practice, for example, setting up experimental policies, aligning and combining



### **Directionality: How industrialisation has shaped our modern world**

Most of our current social practices and technologies were constructed using the rules and principles of a world shaped by global industrialisation.

The rule of using fossil fuels was a key milestone in the emergence of this 'industrial modernity', transforming our energy use from renewable sources – such as wood and charcoal; human and animal muscle; or wind and water – towards the energy of the sun, stored in hydrocarbons millions of years ago. We moved from husbanding and

existing policies in new policy mixes, supporting and connecting societal initiatives, or trying out new governance arrangements.

In this **User Guide to Component 2**, we will use the term experiment to capture the breadth of what an EPE entails in the context of implementing TIP: that is, doing an experiment; promoting a culture of experimentation; and nurturing an experimental mindset.

The notion of experimentation will be unique in each context and likely to evolve throughout the course of delivery within that context. Above all, experimentation conveys the intent to try out alternatives, to unearth and work with ambiguities and uncertainties. Trying to 'do' system change is like being lost in a forest of options: exploration is needed to discover useful paths and overcome visible and unanticipated obstacles. This exploration lies at the heart of experimentation.

## Section 1: Exploring the experimental space

As we outlined in **Component 1**, the first step for setting up an experimental policy engagement, or EPE, is the construction of a transformative theory of change (TTOC) that reflects an understanding of a sociotechnical system in a particular societal, cultural and historical context – for public sector actors in science, technology and innovation agencies, this understanding may be informed, for example, by a historical review of the country's policies and governance frameworks, reflecting on the past failures and successes.

The TToC helps us to identify opportunities for change in the system, influenced by landscape pressures and by the emergence of new, alternative practices. These opportunities amount to a space in which experiments can be defined.

Two types of EPEs emerge in TIP thinking. The first can be described as fit and conform: this is shorthand for essential developments that are aligned with (and improve upon) current practices by introducing new technological or social innovation addressing sustainability. Fit and conform innovations are generally consistent with partial system redesign or optimisation. They can be stepping stones to more fundamental change, providing they do not create barriers, or lock-in (where the cost of replacing them becomes a barrier to change).

The second type, stretch and transform, refers to EPEs orientated towards more fundamental system change. These may involve major changes in the rules driving and governing the socio-technical system. For example, a stretch and transform approach to waste might move beyond the modification of recycling practices to enable a circular economy, and to address the design, production and choice of materials to facilitate repair and reuse.

To explore the options available to us in an experimental space, we need to imagine and develop pathways to desirable futures. We can aid imagination

harvesting resources (such as plants and animals used for fuel and food) to extraction, with fossil hydrocarbons becoming the foundation for industrialised chemical industries that reshaped textiles, agriculture, and materials.

The social and cultural features of this era included viewing nature as a resource for extraction and markets (rather than human relationships of reciprocity) as the determinants of value.

Collectively, these developments represent a trajectory or directionality with powerful momentum.



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through the use of thought experiments: proposing a particular action, and then considering what this action might precipitate – both in terms of the opportunities highlighted by the localised TToC, and the likely resistances and barriers to the action. Thought experiments are useful for weighing up choices before committing to a particular course.

Many issues, however, cannot be addressed by thought experiments alone. A thought experiment may also be influenced by biases, such as the degree of optimism or pessimism of those engaged in the process. A TToC should therefore be accompanied by anticipation work, to imagine and bring to life desirable futures. This helps us to navigate and offset worries about leaving behind seemingly functional (yet unsustainable and socially unjust) practices, by opening up visions of alternatives.

In principle, we can develop Transformative Innovation Policy (TIP) experiments to target the transformation of a complete sociotechnical system or multiple systems; in practice, it is likely that the experimentation will focus on a particular policy, project or programme, perhaps originally conceived outside of a TIP framework.

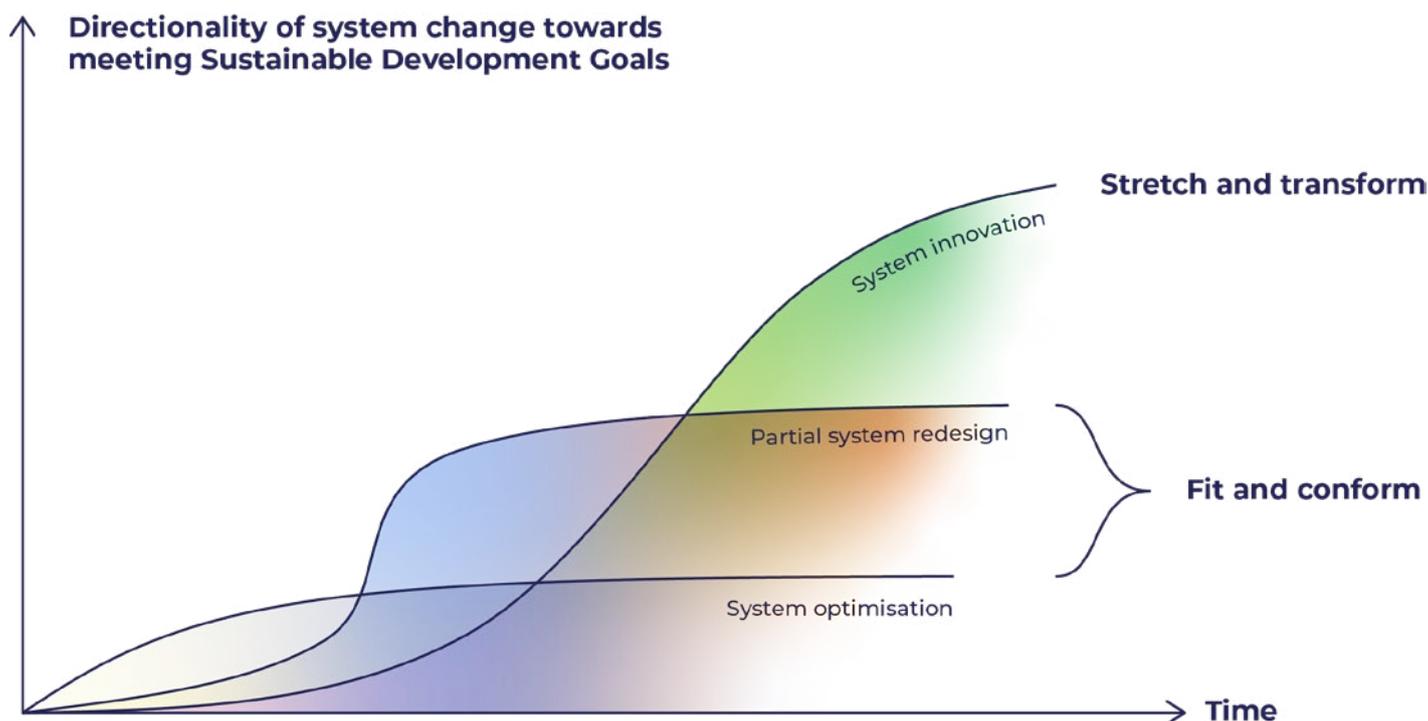
In these instances, we can use a TIP evaluation methodology, employing formative techniques for monitoring and learning (see Component 3), to 'stretch' the transformative potential of the existing initiative – or some aspect of it – while adhering to the existing framing, targets and success criteria.



## Examples: Fit and conform vs stretch and transform

A technological example of fit and conform is the development of large scale photoelectric solar capacity as a competitor for fossil fuel using electrical generation. This approach to solar energy fits in the current system of grid distribution of electricity and conforms with the competitive paradigm that demands the new technology is cost-effective.

A stretch and transform example might be a prosumer movement that involves installation of thousands of solar panels, each providing power to individual businesses and homes, and some connected to local micro-grids for the purpose of energy storage or load levelling. This decentralised approach moves away from dependence on mass distribution of electricity through grids and involves innovation in the control of electricity use and storage to meet human energy needs. It also creates a space to alter the culture of energy use, creating more direct responsibility for consumption.



Fit and conform' vs 'stretch and transform', adapted from Weterings et al 1997

Ideally, we would stretch an existing project in the direction of more deep-rooted system change. However, it may be that partial system redesign – a fit and conform strategy – is more realistic in the face of ongoing project demands. Since a fit and conform approach does not change the fundamental rules governing a project, it is only likely to deliver transformative impact if it can provoke reflection on how these rules could be changed in future projects through experimental engagement with the ongoing project.

Finally, as pressure for transformative change grows, we may see more scope for ‘clean sheet’ or ‘green field’ experiments – new interventions, technologies, social arrangements, business models or means of exchange (including markets), developed from scratch in accordance with TIP principles. In many cases, these initiatives will be able to build on documented learnings from existing niches, demonstrators, trials or experiences.

Clean sheet experiments address more directly the uncertainties (such as viability, acceptability and robustness) of an alternative configuration of social and technological arrangements. As the new configuration may be untried in that context, or even new to the world, anticipation and thought experiments with a TToC are particularly important in the development process.

## Section 2: Defining an experiment

In Transformative Innovation Policy (TIP), experimentation helps us to explore the feasibility of altering prevailing rules, and subsequently define pathways toward transformative change.

TIP theory suggests that rule change is most likely to come through a dynamic process of niche upscaling and breakthrough. It is also possible that regime actors in the incumbent systems may choose to alter their operating principles (rules) in response to landscape pressures or disruptions in ordinary practices. Additionally, a combination of public and private actors may seek transformation, recognising the need for change in current sociotechnical systems and the opportunities for wealth creation and public benefit presented by this change.

With these possibilities in mind, four types of experiments are congruent with the TIP approach:

- 1. Building, consolidating, replicating or upscaling niche innovations** (social and technological) to offer a clear alternative to existing rules and foster eventual niche breakthrough, e.g.
  - farm to table as an alternative to mass food distribution
  - repair and re-purpose as an alternative to discarding
  - renewable energy charging stations for shared electrical vehicles as an alternative to fossil fuel-produced electricity and vehicles
  - community renewable energy as an alternative to large-scale generation and grid distribution of electricity



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**2. Reforming existing regimes**, in order to revise and modify rules in more transformative directions, e.g.

- extending the range of waste products able to be recycled
- street lighting using photovoltaic panels
- separating storm and household sewage
- collection and redistribution of food that would otherwise be discarded
- development of electrical vehicles
- localisation of food production for school meals

**3. Building bridges between regime rules and niche rules** that hasten the replacement of existing rules with alternatives, e.g.

- constructing cycle lanes to encourage a reduction in automobile and mass transit use
- creating machine-readable libraries for repair parts that can be made using additive manufacturing, such as 3D-printing technology
- devising control systems and social arrangements for investing in and managing renewable energy micro-grids

**4. Strategic commitment by public and private actors to a combination of actions** (e.g. policy mixes, procurement, regulation and investment) that in TIP might be referred to as a transformative bundle, e.g.

- historical campaign to eliminate the use of chlorofluorocarbons by a mixture of public regulation and promotion of private innovation in alternative coolants
- efforts to preserve particular megafauna species such as tigers and rhinos by creating publicly protected habitats and privately managed ecotourism
- various smart city developments involving mixes of public regulation, procurement from the private sector and incentives for private investment.

The bundles may have been led by public sector policy changes, but take effect due to the joint commitment of NGOs, political support and private sector participation.

These types of experiments and the examples offered are by no means exhaustive. The key to the TIP approach is the adoption of an experimental mindset.

In many cases, immediate political and social need in the local context will drive innovation initiatives and commitments. Under these conditions, experimentation may need to take place within the context of projects or policies that are not necessarily aligned with transformation. It is still possible, however, to identify and document the experimental intent, to inject a culture of experimentation, and to record and communicate learnings, feeding these into future project designs and execution. The accumulation of experiments of different types, by multiple actors embracing this culture, strengthens the foundations for transformative change.

TIP thinking encourages us to consider three factors when defining or selecting an experiment:

- 1. Actors:** It is important to have an inclusive base of support for the experiment – particularly one that involves those potentially affected by the scaling up or strengthening of niches, and by the alternative rules explored. An inclusive group of actors also offers a constituency for

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the changes that the experiment seeks to develop, and a community for contributing and sharing knowledge.

The actors should include those able to take the experiment forward – people with a commitment to replicating, scaling and building on the knowledge gained from the experiment, and to preserving and developing the experimental mindset. This helps to guard against the experiment becoming a ‘bubble’ that bursts upon completion.

One instrumental type of actor in maintaining continuity and carrying forward the learnings is the intermediary. This may be a community-based organisation, for example, or an NGO, able to unite disparate groups and interests around the experiment and link it to past and future initiatives.

- 2. Scope:** The scope of an experiment needs to be wide enough to allow realistic and comprehensive engagement with the uncertainties, questions and issues it seeks to answer.

Of course, experiments cannot entirely resolve questions about scalability or social acceptance (and hence replication), but if they engage a broader range of stakeholders – rather than only focussing on those most enthusiastic or with an immediate stake – they will generate higher quality information.

This can be a challenging trade-off: the advantages of increasing the scope may be offset by the potential chaos of disparate and conflicting interests. It is one of the reasons why TIP experimentation involves political negotiation and consensus-building around collective and shared notions of transformative change. Defining the scope of an experiment can be a vital part of this negotiation.

- 3. Feasibility:** The feasibility of a prospective experiment will be influenced by the actors and scope. Broadening the number of actors and scope will increase direct financial costs, and also the indirect costs – not only of conducting the experiment, but of documenting the process of learning-by-doing from design through to execution.

Feasibility is also affected by the nature and scale of opposition to the experiment. Such opposition may be passive – change often involves varying existing regulations or norms and thus encounters resistance. Opposition may also be active – some actors may view the experiment as challenging their market, social position or other established practices. In these cases, assessing feasibility may involve negotiation or even activist campaigning to make the experiment possible.



**TIP experimentation involves political negotiation and consensus-building around collective and shared notions of transformative change.**

## Section 3: Managing the experiment and adjusting for context

There are many more opportunities for experimentation beyond setting up a standardised, purpose-built (or clean sheet) TIP experiment. Experimentation is also about the stretching of conventional frameworks – such as those geared towards identifying a required change that becomes the target for policy design – and can help us to select the best available policy interventions.

An experimental mindset takes all interventions as provisional and likely to fall short of achieving a transformative result: it is through learning that uncertainties are resolved and new alternatives discovered. However, to reap the benefits of experimentation, we need participants to be actively engaged in the mindset that we are aiming to learn, as well as perform. This is a key part of what we refer to as managing an experiment.

TIP is a global framework, with scope for application across all contexts. Although the researchers and members shaping the materials in the Resource Lab are a diverse group, we are also mindful that their experience and outlook shapes the concepts, interpretation and vocabulary of TIP. In this sense, TIP can be viewed as a boundary object: a platform accessed and translated by many people, each with diverse understandings of its meaning and application within their context. We each unravel and work with the framework differently across our geographical and cultural contexts, academic disciplines and practitioner experiences.

Component 4 of this resource lab will provide tools for working with diverse groups of people to build a common understanding of TIP theory, methods and practice, shaped to local context. For now, we argue that managing TIP experiments involves a commitment to two principal aims: to generate and disseminate knowledge acquired through experimentation; and to empower those involved in experiments to be agents, rather than subjects, of change.

In terms of practical management, our approach to experimentation should involve documenting our overall intent: what do we need to learn in order to increase the likelihood of more widespread and rapid transformative change? Ideally, the transformative theory of change (TToC) will have highlighted uncertainties, as well as opportunities, that will become the basis for our experimentation. The TToC will also show which deliverables (or outputs) from an experiment we are seeking, and the associated outcomes or impacts we hope to achieve.

When we focus on what is to be learned, we are identifying a particular unknown, one that can't be looked up or duplicated from another context; at the same time, we are making a plan for discovery. Academics might call this a research plan; others might refer to it as a pilot, demonstration project or prototype creation. Documenting the plan for discovery facilitates monitoring and formative

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evaluation (discussed in Component 3). It also increases the likelihood that diverse participants share a common motive and intent, derived from compromises and accommodations along the way.

In TIP, we often keep diaries and journals during the experiment – not only because they help us to recover knowledge of actions and findings, but also because they contain raw material for further reflection and rethinking. In recording experience, it is helpful to consider alternative means for recording – video diaries, interviews, and blogs, for example, may be equally useful. Recording is equally relevant whether we think the experiment has resulted in marked success (a major increment to knowledge that can be further developed and utilised) or more limited success (important knowledge about what doesn't work or what should have been done differently).

Notice the word 'failure' is not used here: experiments may be disappointing, but as in life, we learn from results that differ from our expectations. Sometimes, we learn more from disappointments or limited successes than from when things go according to plan. When managing the experiment, we need to build spaces for honest feedback and thinking into its design. Facilitated retrospectives or post workshop briefing sessions, for example, can be important sources of learning about what went well and what could be done better next time. The most important outcome of TIP experimentation is the learning that takes place, in many shapes, sizes and forms, and being able to elicit this is a fundamental goal and skill in conducting an experimental policy engagement.

Effort should be made to relate an experiment to other initiatives addressing similar challenges, whether these involve the same actors or are taking place in other contexts. Opportunities to communicate and share the intent and discovery plans open up possibilities for alignment or division of labour and can provide a major gain; similarly, learning from what others have discovered and experienced can be an important tool for revising and extending future experiments. Transformative change requires more than one experiment at a time. Creating opportunities to explore an experimental space across multiple projects, programmes and policies is therefore a practical way to steer in a transformative direction.

The current, large-scale experiment of industrial modernity is not working well for the future of humanity. At the very least, we hope experimentation – through a process of exploration and reflection – will allow us to seriously examine what modernisation might mean.



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