



INNOVATION
FACETS

Public Sector Innovation Facets

ANTICIPATORY INNOVATION

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CONTENTS

Summary	03
Introduction	03
What is anticipatory innovation?	05
The challenge	05
Main drivers and support structures of anticipatory innovation	06
Main drivers	06
Enabling conditions	07
Tools and methods	10
Setting up anticipatory innovation	12
Running anticipatory innovation	12
Evaluating anticipatory innovation	13
Skills and capacities needed for anticipatory innovation	14
Policy relevance	16

The Observatory of Public Sector Innovation collects and analyses examples and shared experiences of public sector innovation to provide practical advice to countries on how to make innovation work.

This report contains a summary of research and insights from practice on anticipatory innovation. A more extensive version of this brief including detailed discussion and case studies appears as a chapter in a forthcoming OECD report.

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SUMMARY

- Governments require future-oriented innovations in order to respond to complex challenges, such as climate change, aging societies and digital transformation, in real time. Anticipatory innovation is the act of creating and implementing new, value-shifting innovations in environments of deep uncertainty, particularly for the purposes of exploration and shaping future priorities.
 - Governments opt for anticipatory innovation when there is a high degree of uncertainty about how trends might evolve. Indeed, major changes are often easiest – and cheapest – to shape in the emergent stage before they are locked in. An example could be funding projects to explore what electricity storage at the grid scale might look like in the future.
 - The emerging field of anticipatory innovation expands the frontier of less action-oriented disciplines such as futures thinking and strategic foresight. Its purpose is to make futures knowledge actionable by implementing real innovations based on empirical experimentation.
 - The necessary conditions for facilitating anticipatory innovation in the public sector are strong foresight ecosystems closely connected to innovation governance structures, and working methods that embed anticipatory innovation in day-to-day processes.
 - Diverse methodologies exist to capture each aspect of the iterative process of perceiving, making sense of and acting on emerging futures. Research shows that far more tools exist to perceive and make sense of futures, than for converting insights into action and evaluating outcomes.
 - In order to build anticipatory innovation capacity, governments must be able to draw on subject matter expertise, imagination and an appreciation of emergence and complexity. Communication of anticipatory insights and sustained demand for anticipatory innovation from senior leadership in government is essential.
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INTRODUCTION

The social, economic and ecological challenges that confront societies today require novel public sector solutions. As governments explore how to change the very foundations of governance and democracy to meet the needs of the 21st century environment, innovation is becoming an imperative to stay ahead of the curve. Governments are increasingly aware of the need to mitigate and leverage the high rate of societal and technological change, but they are still ill-equipped to innovate on a consistent basis and to anticipate signals from the external environment before they become realities.

The Public Sector Innovation Facets model provides an easy way to consider what innovative approaches and instruments governments can use to respond to emerging challenges in a timely manner. It investigates questions such as: What types of public sector innovation exist? How are innovative ideas generated in the public sector? Which methods are used to support investment

in innovative projects? What capacity and resources are required for public sector innovation? The model identifies four innovation “facets” which can be used to explore the purpose and intent of innovation activities as well as how they work in practice. The four facets of the model are as follows:

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Enhancement-oriented innovation upgrades practices, achieves efficiencies and better results, and builds on existing structures (e.g. through digitalising services and better process management). An example of this type of innovation is the use of behavioural insights to improve the compliance rate with one-time payments.
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Adaptive innovation tests and tries new approaches in order to respond to a changing operating environment (e.g. co-designing new community responses to emerging challenges such as the COVID-19 pandemic). Governments adopting social media as a channel for citizen interaction is an instance of adaptive innovation.
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Mission-oriented innovation establishes a clear outcome and an overarching objective for achieving a specific mission (e.g. setting clear goals and roadmaps towards carbon neutrality). As an example, setting an objective to dramatically reduce greenhouse emissions within a decade is a mission-oriented approach to innovation.
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Anticipatory innovation explores and engages with emergent issues that might shape future priorities and future commitments (e.g. conducting experiments to explore the future of work). An example of anticipatory innovation is the use of a sandbox to explore the impact of Artificial Intelligence on service delivery in health.

This brief focuses on anticipatory innovation in the public sector. In order to understand key trends in the emerging field of anticipatory innovation, the Observatory of Public Sector Innovation (OPSI) conducted research and invited public servants to share their experiences and examples of anticipatory innovation in the public sector. Insights are provided on the following key themes: approaches to anticipatory innovation, main drivers and support structures in the public sector, tools and methods, and skills and capacities needed. A more extensive version of this brief, including detailed discussion and case studies, appears as a chapter (“Anticipatory Innovation”) in a forthcoming OECD report. The present Public Sector Innovation Facets brief is intended as a summary for policy makers and practitioners.

WHAT IS ANTICIPATORY INNOVATION?

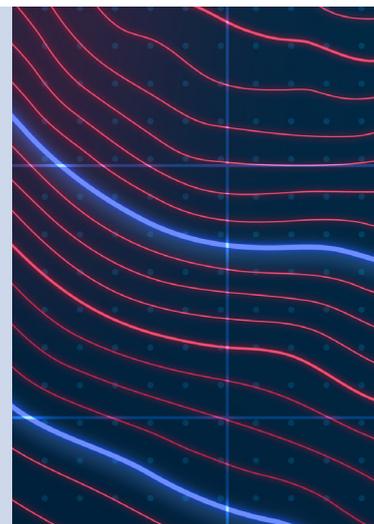
Anticipatory innovation is the act of creating and implementing new, value-shifting innovations in environments of deep uncertainty, particularly for the purpose of exploration and shaping future priorities.¹ Anticipatory innovation involves picking up on signals of change, exploring emergent issues, testing assumptions and exploring radically different possibilities. It means implementation and learning that iteratively respond to the future as it unfolds. It is about ensuring that new technologies and innovations respond to both immediate concerns and future challenges.

Strategic foresight is a critical driver of insight and knowledge for anticipatory innovation. However, with anticipatory innovation, the emphasis is on the importance of acting in the present with a future mindset. The aim is to steer development, while analysing and testing out the boundaries of ethical, legal and social aspects of change. Anticipatory innovation governance should consider uncertainty (not risk) over extended timeframes, and develop the capacity to mitigate the former adaptively by changing actions today (see Box 1 for an example from the defence sector).

Box 1. The Netherlands Armed Forces Futures: Scenarios in action

The Dutch Ministry of Defence has a long tradition of foresight activities. The report “Defensievisie 2035” outlines principles for action to prepare the armed forces for possible futures. As part of this process, the Ministry created scenarios with a time horizon of 2025. These scenarios are intentionally fictional but with a strong plausibility and impact potential. From these exploratory, contextual scenarios, some potential future situations were derived, and analysed for the capacities and preparedness they would demand of the Dutch armed forces. As in all effective foresight processes, the scenarios themselves are less important than the insights derived from them.

Source: Netherlands Ministry of Defense (2010).



The challenge

To make policy is to think about the future. Every policy designed and delivered carries implicit or explicit notions of the context in which it will be implemented, the intended consequences and its potential effectiveness. Often these notions are based on expectations, forecasts, predictions and assumptions – mental models – about what the world will look like and how it will work. These mental models are not well suited to situations of volatility, uncertainty, complexity and ambiguity because they project the future in a linear manner that is not reflected in reality.

¹ Tönurist, P. and Hanson, A. (2020). “Anticipatory innovation governance: Shaping the future through proactive policy making”, *OECD Working Papers on Public Governance*, Vol. 44 No. 44, <https://doi.org/10.1787/cce14d80-en>. Hereafter cited as Tönurist and Hanson (2020).

Take the deployment of new and disruptive technologies. These are transforming the production and distribution of goods and services, changing the status quo for economies and societies, and resulting in new inequalities. This has serious implications for future employment, skills, income distribution, trade and well-being. Governments need to understand and anticipate the impacts of technology and change as well as the shifting expectations of citizens, companies and innovators, and their implications for public policy. This requires new forms of innovation governance that allow policy makers to respond to unforeseen events and technological change in real time.



MAIN DRIVERS AND SUPPORT STRUCTURES OF ANTICIPATORY INNOVATION

Main drivers

During crises organisations often recognise the need for and turn towards anticipatory innovation. What drives anticipatory innovation is thus a mix of factors which push organisations to step away from the comfort of the present and illuminate the need to act on signals of change (see Box 2 for an example from the future of work). OECD research has identified the following main drivers of anticipatory innovation in the public sector: the impetus to make sense of complex policy problems, the need to decide and plan under conditions of uncertainty, pressure to respond to novel societal and technological developments, and the cost of doing nothing in the face of rapid change (see Table 1).

Box 2. The Future of Work in Australia

Launched in 2016, this project set out to imagine the evolution of Australian jobs and labour markets by the year 2035. The focus was on digital technology disruption and on key drivers including globalisation, demographic and cultural changes, health and public wellbeing. The project resulted in the *Tomorrow's Digitally Enabled Workforce* report and a set of six megatrends and four scenarios that have become a point of reference for both public and private organisations in planning their future workforce. Various ministries have integrated the megatrends and findings of the report in their policy-making processes. The Australian Government uses them as key inputs to the International Labour Organization's "Future of Work Centenary Initiative".

Source: Hajkowicz et al. (2016).

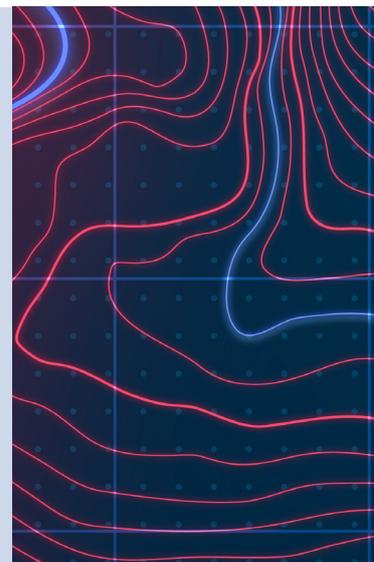


Table 1. Main drivers of anticipatory innovation in the public sector

CLUSTER	DRIVERS	EXAMPLES
Decision making and planning under uncertainty	<ul style="list-style-type: none"> • Prioritise some futures • Prepare for disruptions 	<ul style="list-style-type: none"> • The United States' defence strategic planning: "selected" scenarios based on strategic priorities and perceptions of global affairs • Royal Dutch Shell's systemic foresight helped prepare for the 1979 oil crisis, the collapse of the Soviet Union, etc.
Making sense of complex policy problems	<ul style="list-style-type: none"> • Make sense of intersecting, conflicting or cross-sectoral issues • Develop multi-dimensional and systemic solutions 	<ul style="list-style-type: none"> • The European Commission's IMAJINE Scenario Sketches capture potential consequences of spatial injustice in Europe • Climate change requires expertise and co-ordination among policy makers across multiple issues related to agriculture, water, food security, immigration, diplomacy, and defence
Responding to novel societal and technological developments	<ul style="list-style-type: none"> • Take decisions when the impact is unclear, novel or unprecedented 	<ul style="list-style-type: none"> • Disruptive technologies (the Internet of Things, gene editing, neuro-technologies, blockchain, platform technologies, etc.) transform the production and distribution of goods and services, with significant impacts on society
The cost of doing nothing in the face of rapid change	<ul style="list-style-type: none"> • Fatigue of "futures talk" and move towards proactive government • Aftermath of crises 	<ul style="list-style-type: none"> • Increase in anticipatory activity after the 2008 financial crisis and the COVID-19 pandemic

Source: Authors' summary. See further in OECD (forthcoming).

Enabling conditions

Enabling conditions are the framework that makes anticipatory innovation possible. They can include collaboration mechanisms, decision-making processes or working practices.

Enabling conditions for anticipatory innovation in the public sector include:

1. **action-oriented foresight ecosystems,**
2. **anticipatory governance and**
3. **tested working methods.**



1. ACTION-ORIENTED FORESIGHT ECOSYSTEMS

Foresight ecosystems refer to the broader structures, institutions and capabilities in government related to future knowledge and foresight in which anticipatory innovation is situated.² Common features of the foresight ecosystem include:

- **mainstreaming anticipatory innovation into everyday work through culture and behaviour**
- **purposeful processes to generate futures knowledge for use in prototypes and experimentation**
- **structures and institutions which reward the practices of anticipatory innovation.**

It is also common to find networks of practice specialised in government foresight in ecosystems where anticipation is widely practised. Examples include Finland's National Foresight Network (see Box 3), foresight networks in the European Union and the OECD Government Foresight Community.

2. ANTICIPATORY GOVERNANCE APPROACHES

Systematically engaging in anticipatory innovation requires room for new combinations of governance mechanisms within the core architecture of government. In order to do things differently, policy makers need agency – ways to operationalise their actions combined with a belief in their ability – and an authorising environment that gives them the authority and legitimacy to challenge current values. Together these dimensions constitute the general framework for anticipatory innovation governance mechanisms needed to ensure sustained strategic foresight (see Figure 1). A detailed discussion on the dimensions of anticipatory innovation can be found in the OECD working paper "[Anticipatory Innovation Governance](#)".³

3. TESTED WORKING METHODS

Governments have developed various protocols for practising and implementing anticipation, foresight and anticipatory innovation. For example, the Centre for Strategic Futures has developed a multi-phase process of "scout, challenge, grow" to help the Singapore government transcend prevailing assumptions, better manage risk and uncertainty, and develop greater resilience to possible shocks.⁴ Other governments have produced their own approaches; examples include the Horizons Foresight Method of Policy Horizons Canada (2016) and the Futures Toolkit of the UK Government Office for Science (2017).

² OECD (2019). Strategic Foresight for Better Policies, OECD Publishing, Paris, www.oecd.org/strategic-foresight/ourwork/Strategic%20Foresight%20for%20Better%20Policies.pdf.

OECD (2021). Towards a Strategic Foresight System in Ireland, <https://oecd-opsi.org/wp-content/uploads/2021/05/Strategic-Foresight-in-Ireland.pdf>.
SOIF (2021). Features of Effective Systemic Foresight in Governments Globally, School of International Futures, London, www.gov.uk/government/publications/features-of-effective-systemic-foresight-in-governments-globally (accessed 28 June 2021).

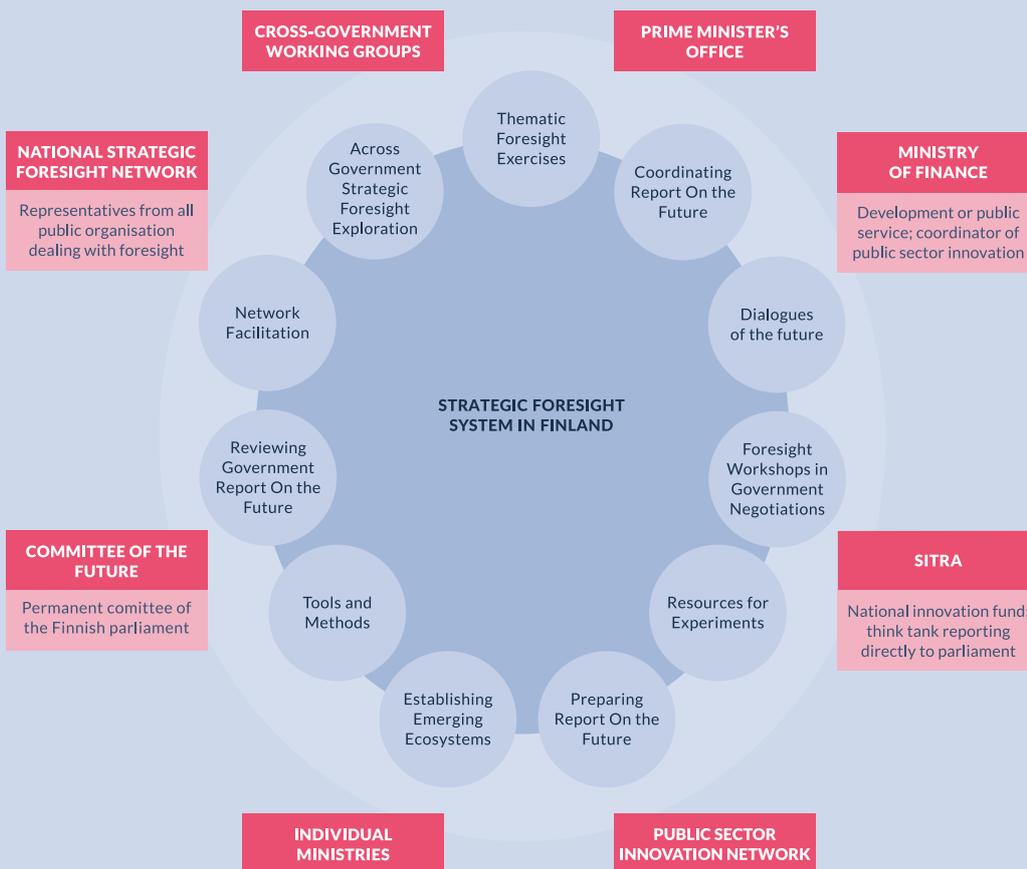
³ Tönurist and Hanson (2020).

⁴ Kwek, J. and S.G. Parkash (2020). "Strategic foresight: Making sense of a turbulent world", *Apolitical*, August, <https://apolitical.co/solution-articles/en/strategic-foresight-making-sense-of-a-turbulent-world> (accessed 7 July 2021).

Box 3. Finland's National Foresight Network

Under the coordination of the Prime Minister's Office and Sitra (the Finnish Innovation Fund), Finland's National Foresight Network acts as a forum for discussion and co-ordination among the country's key strategic foresight players. By bringing together ministries, government agencies, regional councils, private sector actors, academia and NGOs, the Network promotes the use of future perspectives and foresight data in the country's decision-making process at various governance levels. The open Network holds monthly "Foresight Fridays" meetings that involve participants in training, presentations and networking events. In the lead up to parliamentary elections, the Network produced future scenarios envisioning Finland's future up to 2025, with a focus on digitisation, the needs of an ageing population and labour market reform. The scenarios were made widely available online and succeeded in integrating discussions about the future into the electoral debate.

Outline of main components and activities of Finland's national foresight system



Source: Authors' analysis, Finland Prime Minister's Office and Sitra (2020).

Figure 1. Dimensions of agency and an authorising environment

Source: Tönurist and Hanson (2020).

TOOLS AND METHODS

Anticipatory innovation requires a variety of tools for each stage of the process. Methods of forecasting and visioning are essential at the outset, followed by tools to develop imagination, frame strategies and generate action. Finally, specific tools are needed to evaluate anticipatory innovation in terms of success and learning. Anticipatory tools thus have a variety of purposes (see Table 2 for examples). They support enhancing creativity and imagination (e.g., visioning, historical analogy, gaming) and give licence to explore options (e.g., scenarios, course of action analysis). They allow for testing in practice (e.g., adaption pathways) and help generalise and validate knowledge (e.g. developmental evaluation). Research shows that more tools are available to help perceive and make sense of futures, than for converting insights into action. The following section provides an overview of the main types of tools and methods used in anticipatory innovation.



Table 2. Examples of tools and methods supporting anticipatory innovation

STEP	OBJECTIVES	EXAMPLES OF TOOLS AND METHODS
PROCESS: Setting up anticipatory innovation		
Forecasting and horizon scanning	<ul style="list-style-type: none"> • Seek signals of change in the present and determine their potential future impacts 	<ul style="list-style-type: none"> • Detection of signals and weak signals • Web content analysis and text mining • Delphi method • Real-time data monitoring and predictive analytics • Thick data • MCDA
Visioning	<ul style="list-style-type: none"> • Create a shared vision for a community • Explore what is acceptable (moral and ethical impacts) 	<ul style="list-style-type: none"> • Responsible research and innovation framework • Value Wheel • Ethical impact assessment • Ethical technology assessment • Anticipatory technology ethics • Techno-ethical scenarios approach • Moral plausibility frameworks⁵
PROCESS: Running anticipatory innovation		
Developing futures	<ul style="list-style-type: none"> • Develop futures through creativity and speculation 	<ul style="list-style-type: none"> • Futures Wheel • Cross-impacting • Roadmapping and technology assessment • Six Thinking Hats Methodology
Framing futures	<ul style="list-style-type: none"> • Focus and challenge different ideas of the future 	<ul style="list-style-type: none"> • Scenarios • Megatrends • Causal layered analysis
Acting on futures knowledge	<ul style="list-style-type: none"> • Take action on futures knowledge 	<ul style="list-style-type: none"> • Stress-testing and wind-tunnelling • Prototyping • Early warning systems • Regulatory sandboxes • Anticipatory action learning • Experimentation and RCTs • Six Pillars approach • Futures Action Model • Nodklapp's Actionable Futures Toolkit • Policy Horizons Canada method • Futures Toolkit

⁵ Lucivero, F. (2016). *Ethical Assessments of Emerging Technologies: Appraising the Moral Plausibility of Technological Visions*, Springer International Publishing, <https://doi.org/10.1007/978-3-319-23282-9>.

PROCESS: Evaluating anticipatory innovation**Measuring impact**

- Evaluate the benefits of anticipatory activity
- Strategic reframing

Source: Authors' summary.

Setting up anticipatory innovation

Anticipatory innovation uses knowledge about the future to inform potential developments, events or courses of action. Indicators can help policy makers track events, spot trends and separate relevant information from noise. **Forecasting and horizon scanning methods** help to identify signals of change in the present and their potential future impacts. **Visioning** tools create a shared vision for the organisation or community and explore not just what may be plausible but also what are acceptable futures for individuals and communities. However, these methods rely on the information captured or the significance attributed to it. How and how often data are collected is likely to affect the quality of any scanning and visioning exercise.

Running anticipatory innovation

Anticipatory innovation requires developing, framing and acting on the information derived from futures knowledge.

Signals of emerging future change can be further **developed** in numerous ways, often through the use of creativity and imagination to encourage speculation. These approaches derive from a new generation of design thinking that is transdisciplinary, commons-oriented, collaborative and participatory in nature. Examples include roadmapping and technology assessment.

It is crucial to narrow down the possibilities in order to focus on the most significant out of many potential developments. The principal approach used to achieve this is **framing**.⁶ Framing is inevitable and universal; it is often done unconsciously in the form of stories or “mental models”. Several methods exist to challenge and reshape mental models of the future, including scenario planning and megatrends.

Anticipatory innovation only makes sense if experimentation is followed by **action** on the ground. The example from Slovenia⁷ presented in Box 4 shows how scenarios can be used to spark imagination about plausible challenges and opportunities. However, such scenarios need to be followed by action.

6 Mukherjee, M., R. Ramirez and R. Cuthbertson (2020). “Strategic reframing as a multi-level process enabled with scenario research”, *Long Range Planning*, Vol. 53, No. 5, p. 101933.

7 Polchar, J. and D. Albegiani (2021). *Futures of public administration*, OECD Policy Brief. OECD Observatory of Public Sector Administration, Paris.

Box 4. From experimentation to action - Slovenia's Future of the Public Sector

In collaboration with the Slovenian Ministry of Public Administration, the OECD Observatory of Public Sector Innovation developed scenarios to reframe assumptions and plans regarding Slovenia's public sector human resources. It implemented the findings during a second phase through prototyping workshops. These stages helped to connect visions of desired future states with actions that can be taken at strategic points within the Ministry's talent management competency.

Anticipatory innovation prototyping



Source: OECD (2021).

Evaluating anticipatory innovation

The benefits of any anticipatory activity are difficult to **evaluate**.⁸ The benefits of foresight are often indirect, difficult to measure and rarely solely attributable to foresight interventions. Under these circumstances, practitioners have argued that the clearest observable impacts of strategic foresight are changes in the "mental models" of leaders, observable through reframing of their dialogue. Others have advocated evaluating processes and structures in terms of a "foresight maturity model" for organisations. OECD research has highlighted the benefit of connecting strategic foresight to anticipatory innovation through processes of prototyping and innovation. The aim is to test and evaluate efficiency and effectiveness in terms of predefined objectives, and potentially select control cases for comparison.



8 Grim, T. (2009). "Foresight Maturity Model (FMM): Achieving best practices in the foresight field", *Journal of Futures Studies*, Vol. 13.

SKILLS AND CAPACITIES NEEDED FOR ANTICIPATORY INNOVATION

Individuals and institutions always have an inherent, though usually unconscious sense of time and future. Making futures thinking a conscious discipline applied to policy making is the essence of anticipation and foresight, and their associated capacities. The key skills needed are as follows:

1

Subject matter expertise. Familiarity with a particular subject area is an essential part of horizon scanning and the capability to frame a set of future possibilities (but is not correlated with prescience).

2

Imagination. Different futures are identified through creativity and imagination (see Box 5 for the example of UNESCO's Futures Literacy Labs). However, while scenario methods can elicit a variety of future development paths, they may lack an action orientation.

Box 5. Thinking creatively in UNESCO's Futures Literacy Labs

Futures Literacy Labs allow people to make their anticipatory assumptions explicit. Through structured on-the-ground learning-by-doing activities, Futures Literacy Labs enable people from all walks of life and all ages to learn about the origins of what they imagine. By delving together into topics they care about, from the future of health and well-being to the future of jobs and gender, participants trace the source of their hopes and fears about the future back to their history, culture, context and aspirations.

Futures Literacy Labs deploy action-learning and collective intelligence to co-create the meaning of sustainability, peace and inclusion where people live and work. When people are capable of deciding why and how to use the future, they become better able to detect and create innovation and transformation. They are more at ease with novelty and experimentation, less anxious about uncertainty, humbler about controlling the future, and more confident about being able to comprehend and appreciate the potential opened up by change.

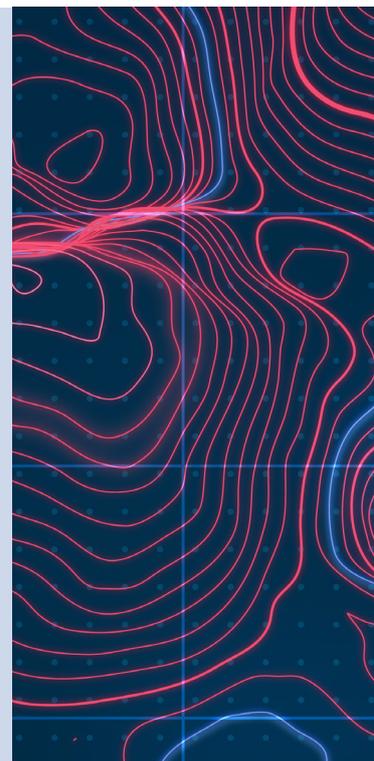
Source: Miller (2018), UNESCO (2020).

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Appreciation of emergence and complexity. Anticipatory innovation requires a willingness to engage with the abstract nature of the future⁹ and deep uncertainty, both of which can complicate decision making.¹⁰ It further

9 OECD (2019b). *Strategic Foresight for Better Policies*, OECD Publishing, Paris, www.oecd.org/strategic-foresight/ourwork/Strategic%20Foresight%20for%20Better%20Policies.pdf.

10 Marchau, V.A. et al. (2019). *Decision Making Under Deep Uncertainty: From Theory to Practice*, Springer Nature Switzerland AG, www.rand.org/pubs/external_publications/EP67833.html (accessed 4 July 2021).



requires the skills to design and facilitate strategic dialogue from futures knowledge in order to draw out implications for policy and strategy. A number of strategies have been used to build these capacities in government. These include hiring experts, creating introductory and specialised training courses, and providing learning-by-doing opportunities. Some of these practices are currently being introduced in Ireland (see Box 6).

4

Leadership and implementation. Sustained demand from senior levels in government is essential for anticipatory innovation. It functions as a source of legitimacy to initiate action and provide the necessary resources and permission for anticipatory innovation. It can also counterbalance the tendency to squeeze out preparation for the future in favour of responding to immediate daily pressures. Sources of high-level demand for strategic foresight in government can include political and legislative commitments, parliamentary oversight, championing by senior civil servants and institutionalised demand through committees.

5

Communication. Anticipatory knowledge is inevitably abstract; accordingly, communicating futures knowledge in a way that balances comprehensiveness and comprehension is often a challenge. One effective approach is to ensure any analysis is left intentionally incomplete, thereby leaving space for decision makers to add their own agency and actions to the narrative.

Box 6. Building a Strategic Foresight System in Ireland

The Irish government is embarking on Our Public Service (OPS) 2030, a new framework for development and innovation in Ireland's public service that builds on Our Public Service 2020. OPS2030 aims to ensure that Ireland's public service is fit-for-purpose for 2030 and beyond. The government and its institutions have pledged to better anticipate future changes, to future-proof policies, and to embrace innovation as an expectation rather than as an exception. Foresight practices exist in pockets of excellence across the Government of Ireland. Two notable historical examples are the Technology Foresight Ireland exercise from the 1990s and the work of the National Economic and Social Council in the 2000s. The current COVID-19 pandemic has been a major factor in highlighting the need for strategic foresight and for many has provided a first experience of scenario planning. OPS2030 will develop systematic foresight capacity to complement subject matter expertise in the civil and public service.

Source: OECD (2021).



POLICY RELEVANCE

The implementation of anticipatory innovation in policy and public service practice responds to a range of urgent governance issues.

Firstly, high-quality policy-driven foresight is often underused in government: this challenge has been dubbed the “impact gap”.¹¹ There are numerous foresight publications from before 2008 about an impending financial crisis, from before 2016 about rising populism,¹² and from before 2019 about a global pandemic that starts in animals.¹³ Many more foresight works imagine events that never come to pass, but can nevertheless be used to help organisations better prepare. The issue in all these cases is not a lack of useful foresight, but rather a lack of use of foresight. It is essential to highlight the value of foresight, and most importantly, translate foresight and futures insights into action. Anticipatory innovation provides the governance structures for acting on futures knowledge.

Secondly, governments are generally known to be risk-averse, rule-driven, and rooted in stable structures and predictable decision making. By design, governments are not able to take action quickly when confronted with new challenges or to act proactively in the face of new opportunities. This means that their response to transformative change is generally reactive at best. To find a different path, practitioners of anticipatory innovation have advocated exploring innovative approaches, novel organisational arrangements, fresh leadership, and new ways of thinking to change how the public sector operates and to remove existing barriers (see Box 7 on testing new anticipatory methods in Finland).¹⁴

Thirdly, governments tend to adopt anticipatory innovation to avoid the “Collingridge Dilemma”.¹⁵ From a governance perspective, this concept states that the point at which it is most likely that a new technology can be simply and effectively regulated through policy, is also the point at which the least information is available about the potential impact of that technology. Examples of this dilemma include current efforts to regulate facial recognition technologies and algorithmic biases. Increased complexity and uncertainty per se do not disqualify traditional policy tools; however, they are unreliable when it is unclear which direction technological innovation will take. New anticipatory innovation tools are needed to increase upstream engagement with technology developers and lead users.

11 Polchar, J. (2021). “Wasted Futures”, Observatory of Public Sector Innovation, 22 February, <https://oecd-opsi.org/wasted-futures> (accessed 8 July 2021).

12 Ministerie van Defensie (2010). “Eindrapport Verkenningen: Houvast voor de krijgsmacht van de toekomst”, 30 March.

13 National Intelligence Council (U.S.) (2017). Global Trends: Paradox of Progress, www.dni.gov/files/images/globalTrends/documents/GT-Full-Report.pdf (accessed 18 May 2017).

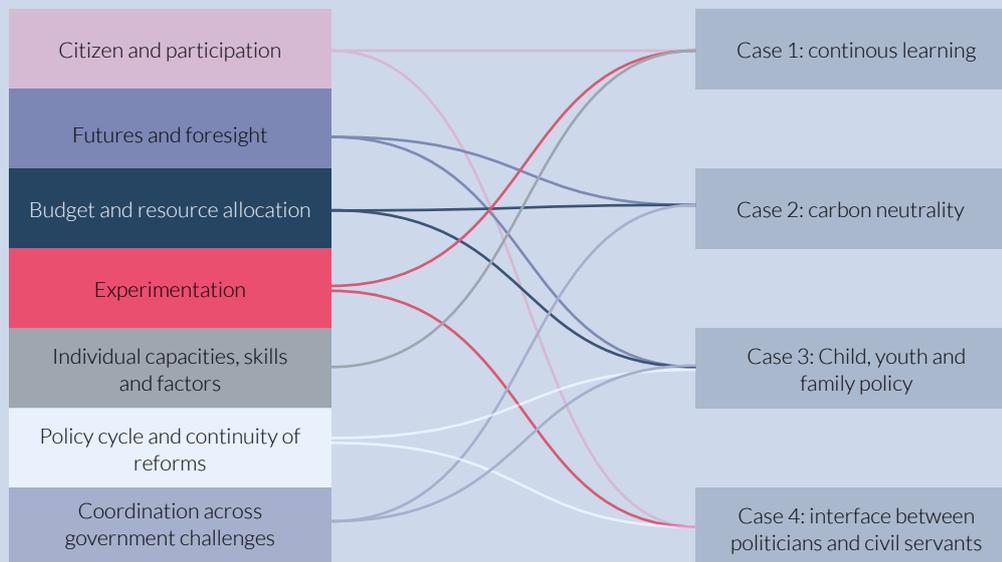
14 Tönurist, P. (2021, 28 September). “Towards an anticipatory innovation governance model in Finland”, <https://oecd-opsi.org/wp-content/uploads/2021/09/Anticipatory-Innovation-Governance-in-Finland.pdf> (accessed 4 October 2021).

15 Collingridge, D. (1980). *The Social Control of Technology*, Frances Pinter.

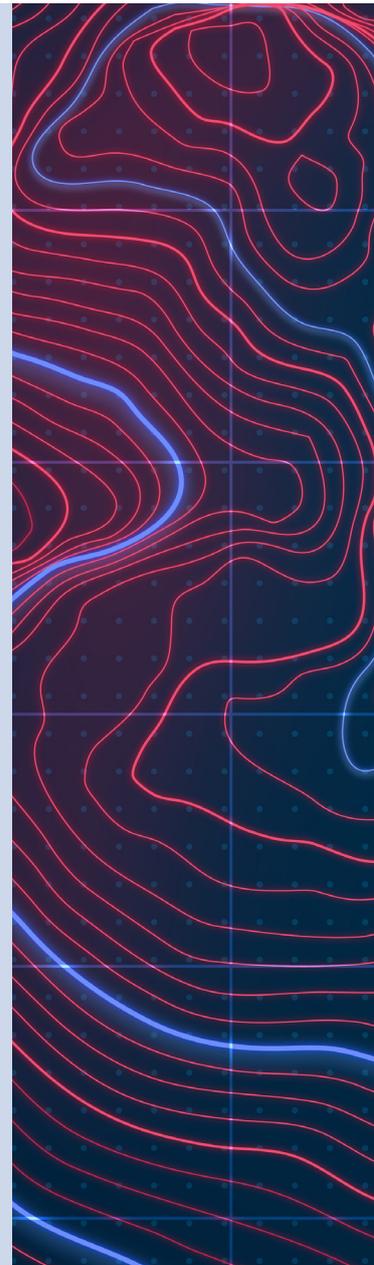
Box 7. Testing anticipatory innovation in practice in Finland

Following an assessment of Finland's anticipatory governance system, the government is now developing a working governance model. This prototype will be tested through four experimental cases and should inform learning about the effective governance of anticipatory innovation. The process should demonstrate how Finland's governance structures can deal with shifting values, new public expectations, uncertain future shocks and a variety of preferable futures that the country wants. The proposed cases include: (1) continuous learning; (2) carbon neutrality and evidence about the future; (3) children, youth and family policy; and (4) dialogues between politicians and leading civil servants on anticipatory innovation governance roles.

Planned cases and their ties to thematic cluster areas



Source: Tönurist (2021).





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