



# Strategic Foresight for Innovation: International Insights to Address Sweden's Future Challenges

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International Insights to Address Sweden's Future Challenges

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# Preface

In a world facing rapid technological development combined with geopolitical uncertainty, more tools are needed to prepare for various conceivable and inconceivable future scenarios. In recent years, Vinnova has explored how methods and approaches in strategic foresight can complement traditional environmental scanning and contribute to enhanced innovation capacity in both the short and long term. In our work, we have had the privilege of exchanging experiences with experts and stakeholders in strategic foresight internationally, and we have observed various initiatives.

In the work leading up to this report, we have engaged in in-depth discussions regarding these initiatives with the aim of creating an initial mapping and comparing them with the situation in Sweden. What can we learn from and be inspired by? What distinguishes strategic foresight from traditional environmental analysis?

The report aims to demonstrate how strategic foresight can strengthen Sweden's innovation capacity and contribute to the country's leadership in sustainable transformation. The hope is that it will serve as a resource for policymakers, researchers, and companies seeking to promote innovation through a forward-looking and strategic approach.

# Summary

Sweden faces a range of complex challenges and opportunities in an increasingly changing world. The coming decade is likely to be characterized by significant uncertainty, where geopolitical instability, technological shifts, and climate change simultaneously influence societal development. In this dynamic context, strategic foresight becomes a crucial capability for ensuring a sustainable and competitive future, particularly for policymakers, political actors, and leaders in both the public and private sectors.

Strategic foresight is a powerful tool that enables these actors to systematically explore various future scenarios and prepare for multiple possible outcomes. For political leaders, foresight can contribute to the development of long-term and adaptable policies, while for businesses, it can enhance their ability to navigate market changes and technological innovations. By using foresight to plan proactively, Sweden's key stakeholders can develop strategies that not only address uncertainties but also capitalize on opportunities for innovation.

This report aims to highlight the importance of strategic foresight and demonstrate how Sweden can strengthen its ability to address future challenges through improved institutionalization and collaboration. With particular attention to the needs of public authorities, businesses, and research institutions, the report emphasizes how a shared future-oriented culture can be fostered. By analyzing international examples, the report provides concrete insights and suggests how foresight efforts can be tailored to ensure that strategic decisions are both long-term sustainable and firmly grounded in the Swedish context.

Although Sweden has taken steps toward utilizing strategic foresight, there is a lack of institutional grounding to meet future demands. Compared to countries that are more advanced in this area, we risk falling behind in competitiveness, as we still lack well-developed tools and processes for anticipating and managing future changes. A broader application of scenario planning, risk analysis, and a sustainability focus can enhance Sweden's societal preparedness and innovation capacity.

The report highlights that cross-sector collaboration between public authorities, businesses, academia, and civil society is crucial for creating a future-oriented culture. Foresight should not only be seen as an analytical method but also as a driving force to stimulate innovation and sustainable societal development. By investing in skill development, interactive foresight processes, and purposeful strategic initiatives, Sweden can be better prepared for future uncertainties. At the same time, this approach opens opportunities to promote sustainable development and long-term welfare. The success of the future depends on the ability to think ahead, act proactively, and shape a desirable society through strategic foresight.

# 1. Strategic Foresight – An Introduction

*In a world marked by increasing complexity and uncertainty, strategic foresight has become an increasingly important tool for decision-makers and organizations. Today, strategic foresight is widely used in everything from public administration and international organizations to the private sector. Foresight is not only employed to anticipate future challenges but also to shape desired futures and inspire sustainable and inclusive strategies. The introductory section of the report outlines the origins of strategic foresight, what it encompasses, and how it is applied.*

## 1.1 From Military Planning to Resilient Societal Strategies

Strategic foresight began to take shape as a research field and methodological discipline in response to the rapid technological and political changes that followed World War II. A decisive factor was the Cold War, which fueled a strong desire to use long-term planning and scenario building to anticipate future challenges and threats.

In the 1950s, researchers at organizations like the RAND Corporation in the United States began using scenarios as a systematic way to predict potential military conflicts with the Soviet Union. RAND and researchers such as Herman Kahn played a central role by creating realistic future narratives that helped decision-makers think long-term about strategic threats and technological developments.<sup>1</sup> During this period, strategic foresight became not only a research area but also a practical tool for governments and companies like Shell, which in the 1970s used scenarios to address the oil crisis and plan for uncertainties in the energy market.<sup>2</sup>

In the 1960s and 1970s, a broader interest in global future issues began to emerge. Researchers, including those from the Club of Rome, became known for their “Limits to Growth” studies, which were among the first scientific attempts to predict the environmental and economic consequences of uncontrolled growth. This marked a shift where foresight also began to focus on sustainability and the long-term survival of humanity.<sup>3</sup>

Scenarios have also been successfully used to guide policymaking and decision-making in governments. For example, in 1991–1992, South Africa used four so-called *Mont Fleur scenarios* during its transition from apartheid<sup>4</sup>. These future scenarios were developed to support a broad consensus on possible paths forward, and the team then applied “backcasting” to identify the steps needed to achieve the desired future state that aligned with the interests of all involved parties.

During the 1990s, more countries began establishing formal units for strategic foresight within government and politics. Finland, Singapore, and the Netherlands are considered pioneers in this field, using foresight as a tool to create more flexible and proactive

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<sup>1</sup> [The Cold War, RAND, and the Generation of Knowledge, 1946-1962 | RAND](#)

<sup>2</sup> [Understanding Strategic Foresight: The History of Scenario Planning | Kalypso](#)

<sup>3</sup> [Understanding “The Limits to Growth” | The Club of Rome](#)

<sup>4</sup> The Mont Fleur project was a type of forum that uniquely used scenario methodology. The purpose of Mont Fleur was not to present absolute truths, but to stimulate a debate about how the next ten years could be shaped. Read more here: [Mont-Fleur.pdf](#)

societal strategies. *(Read more about these countries' work with strategic foresight in Chapter 2.)*

During the same period, interest in using foresight in private companies grew, not only to manage risks but also to identify innovation and business opportunities.

Recently, NATO's [Allied Command Transformation](#) (ACT) has emphasized the central role of foresight in the alliance's long-term security and decision-making through its comprehensive analysis of future security environments. In their strategic foresight report, [Allied Command Transformation - Strategic foresight analysis 2023](#), the need to anticipate and understand the driving forces that will influence the security landscape up to 2043 is highlighted. By identifying the major factors of change—such as climate change, resource scarcity, and rapid technological advancements—and analyzing their impact on diplomatic, economic, and military resources, the report demonstrates how strategic foresight can guide NATO and its member states in strengthening their defense, developing flexible strategies, and creating a shared understanding of future threats. In this way, strategic foresight can become a crucial tool for building resilience and long-term stability in a complex and rapidly changing world.

## 1.2 What is Strategic Foresight?

Foresight is a collective term for methods that help us explore, envision, and anticipate the future in a structured yet open manner. Through these methods, we can identify both challenges and opportunities arising from the various forces of change shaping our future.<sup>5</sup> This is achieved by providing a way to think about what is possible in a deeper, more honest, and more strategic way.<sup>6</sup> In a time characterized by uncertainty, foresight becomes a crucial tool for making well-informed decisions and developing strategic courses of action.

Foresight as a working approach is based on a few fundamental principles:

- The future is viewed as a space of possibilities that cannot be predicted with certainty.
- The focus is on long-term perspectives and systems thinking.
- Diverse perspectives are included to counteract individual and group-based biases.<sup>7</sup>

Strategic foresight is an important complement to traditional environmental monitoring, environmental analysis, and trend spotting (which have also evolved and been supplemented with tools for strategic foresight). Strategic foresight differs by going beyond visible trends to identify potential future developments.

One of the most fundamental differences between strategic foresight and traditional forecasting is that the latter often relies on historical trends and fixed models. Trend spotting focuses on identifying and tracking ongoing trends and is often based on the analysis of historical data. These models can provide a limited view of the future as they assume that current systems and trends will continue unchanged.

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<sup>5</sup> [Why strategic foresight is essential for future preparedness | World Economic Forum](#)

<sup>6</sup> [The Futures Toolkit | GOV.UK](#)

<sup>7</sup> [Why strategic foresight is essential for future preparedness | World Economic Forum](#)



Environmental analysis uses structured tools such as PESTEL analyses (political, economic, social, technological, environmental, and legal) to identify external factors that affect an organization or system. This perspective is broader than trend spotting but still primarily focuses on visible changes. Strategic foresight, on the other hand, acknowledges the possibility of fundamental changes in the system and broadens the perspective to consider a wider range of future possibilities.<sup>8</sup> It focuses on weak signals and non-linear changes, creating preparedness for multiple alternative future scenarios.

By integrating strategic foresight into decision-making processes, organizations can better prepare for future challenges and opportunities.<sup>9</sup> It is precisely the purpose and application of so-called "futures thinking" that distinguishes strategic foresight from general foresight.

- **Foresight** is a broader concept that generally involves exploring and analyzing possible future scenarios and trends. It focuses on understanding how the future might evolve in different ways without necessarily directing the analysis toward specific goals or strategic decisions. Foresight is often used in various fields to identify trends, weak signals, and potential developments.
- **Strategic foresight** is a more goal-oriented form of foresight aimed at supporting long-term planning and decision-making. It is often used by organizations, companies, or governments to formulate strategies and visions aligned with their objectives. Here, the focus is on creating action plans to proactively shape a desired future rather than merely predicting it.

In other words, foresight is about understanding possible futures, while strategic foresight involves actively using these insights to make well-informed and long-term decisions. In this report, we focus on strategic foresight.

Overall, strategic foresight contributes to:

1. Early identification of patterns, trends, and disruptive factors
2. Placing policy decisions in a broader and long-term context
3. Including diverse perspectives through cross-sector collaboration
4. Incorporating alternative perspectives through collaboration
5. Creating evidence-based narratives about the future
6. Exploring and preparing for multiple possible future scenarios

### 1.3 From "Unknown Unknowns" to "Known Unknowns"

The purpose of strategic foresight is not to predict a specific future but to analyze various possible developments to support decision-making and preparation for future changes. The European Commission expresses it as:

Strategic foresight is not about predicting the future; it explores different possible futures, alongside the opportunities and challenges they might present. Ultimately, it helps policy-makers to act in the present to shape the future.<sup>10</sup>

Foresight, therefore, is about structuring a range of possible futures to make them analyzable and planable. This involves identifying and exploring the "unknown

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<sup>8</sup> [The Futures Toolkit | GOV.UK](#)

<sup>9</sup> [Futures, Foresight and Emerging Technologies | GOV.UK](#)

<sup>10</sup> [Strategic foresight | EU Commission](#)



unknowns"—factors we are not yet aware of—and transforming them into "known unknowns" that can be analyzed. In this way, foresight becomes a tool for creating robust scenarios that help us understand and prepare for potential disruptions and significant societal changes. **Unknown unknowns** are the factors we are unaware of and therefore cannot include in our current analyses or plans. These unknown factors can be a major reason why future predictions are limited in their reliability. The term "unknown unknowns" refers to potential events or mechanisms that we cannot even imagine existing.

The purpose of foresight work is to uncover these hidden factors and transform them into known unknowns—factors we are aware of but do not yet fully understand. This makes them possible to investigate and plan for.<sup>11</sup> Which, in turn, enables decision-makers to improve long-term governance and planning and to develop flexible and adaptable strategies.

A central component of strategic foresight is the so-called "cone of plausibility" (see image below), which visualizes various possible futures based on current trends. This cone illustrates that the further one moves from the present, the broader the spectrum of plausible (possible) futures becomes. By utilizing specific tools and methods, strategic foresight can help navigate and understand this complex landscape of future possibilities.<sup>12</sup>

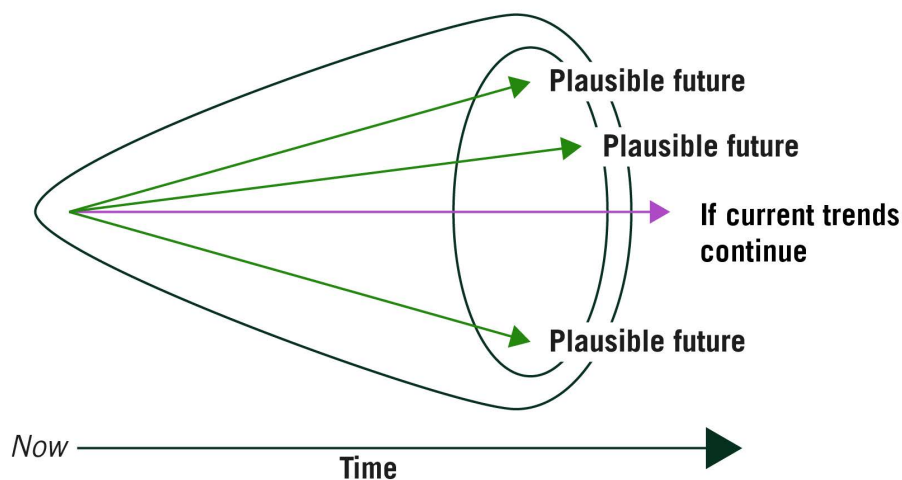


Illustration 1: "The cone of plausibility" points out various possible futures. Source: [Government Office for Science](#).

#### 1.4 Three main elements of strategic foresight

Many countries, organizations, or bodies working with strategic foresight include three main elements in their work:

<sup>11</sup> [Ensuring representativity of scenario sets: The importance of exploring unknown unknowns | ScienceDirect](#)

<sup>12</sup> [The Futures Toolkit | GOV.UK](#)

- analysis and future scenarios
- building foresight capacity (Futures Literacy)
- participation and collaboration

#### 1.4.1 Analysis and Future Scenarios

In today's rapidly changing world, organizations primarily use two established methods to explore possible future scenarios: *horizon scanning* and *scenario planning*. Together, these two methods provide organizations with powerful tools to better understand and prepare for the future. They help identify both opportunities and risks, and enable the development of more robust strategies that can function in various future scenarios.<sup>13</sup>

**Horizon scanning** is a data-driven method used to continuously detect, analyze, and act on future trends and weak signals that may impact policy development and societal decisions. The method is used to systematically scan for changes in the external environment, from major megatrends to weaker signals and unexpected events (wild cards).

A particularly important part is the identification of *weak signals* – subtle and often unclear signs of future changes that can provide early warnings of upcoming trends or events. These signals are often fragmented or ambiguous and can be difficult to distinguish from surrounding "noise," but they are crucial for anticipating future trends or disruptions.

To identify weak signals, several complementary methods are used:

- AI and big data analysis to detect patterns in large datasets, such as news data and social media.
- Expert interviews to gather deep insights within specific areas.
- Observation of "edge cases" to study unusual behaviors in small groups that may indicate larger future trends.
- Structured brainstorming where expert groups conduct multiple iterations to propose ideas and comment on each other's ideas.

Once the information is collected, the changes are categorized based on how quickly they are developing, how significant their potential impact could be, and when they are expected to emerge.<sup>14</sup>

The European Commission's [Joint Research Centre](#) (JRC) provides independent and scientifically based knowledge to support the development of EU policy-making. JRC uses horizon scanning to identify early signals of change to improve European decision-making.<sup>15</sup> [The European Strategy and Policy Analysis System](#) (ESPAS) works on this within nine EU institutions, and after a successful pilot project in 2022, it has developed into regular activity with support from the EU Policy Lab. The aim of the ESPAS project is to improve existing early warning mechanisms and create an expert group that can identify and communicate new signals of change.<sup>16</sup> [Shaping Tomorrow](#) uses AI-driven solutions to analyze over 100,000 sources and generate predictive analyses.

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<sup>13</sup> [Why strategic foresight is essential for future preparedness | World Economic Forum](#)

<sup>14</sup> [Why strategic foresight is essential for future preparedness | World Economic Forum](#)

<sup>15</sup> [Walking the tightrope of risks and opportunities on the horizon | European Commission](#)

<sup>16</sup> [Spotting the Future: How Horizon Scanning can help shape EU Policy | European Commission](#)

## Types of driving forces



### Megatrends

Drive paradigm shifts. While they often take time to form, they have strong, deep and long-lasting impact (e.g. climate change, urbanization).



### Trends

Gradual and long-term shift in the forces shaping the future of a nation, region, industry or society (e.g. decentralization of energy grids, increased integration of biotechnology in everyday technology, geopolitical fragmentation).



### Weak signals

First signs of change that may become significant in the future. While difficult to see now, they can have a major impact (e.g., ice-free Arctic seas, the emergence of AI-generated artistic works in culture, small indoor farming initiatives using technology like hydroponics and LED lights).



### Wildcards

Discontinuities and sudden events with a low probability, high impact and unexpected character (e.g. 9/11, COVID-19). Black swans are a type of wild card, where events are extremely hard to predict and have a significant impact (e.g., the 2008 financial crisis).



### Uncertainties

A critical driving force that can lead to different and contradictory developments or consequences (e.g., the long-term impact of Chat GPT, the effects of climate change, AI development, global trade wars).

Illustration 2: Various driving forces that influence change, from slow megatrends to sudden and unexpected events.<sup>17</sup>

**Scenario planning** creates concrete narratives about possible futures. Instead of trying to predict exactly what will happen, multiple different future scenarios are developed. Information from horizon scanning is used to identify the key uncertainty factors, and then various stories are created about how the future might evolve based on these uncertainty factors.

Shell exemplifies this by weaving together factors such as political development, technology, climate change, and societal changes. Singapore was among the first governments to implement scenario planning in its strategic planning processes.<sup>18</sup>

### 1.4.2 Building Foresight Capacity (futures literacy)

In a world characterized by rapid changes and increasing complexity, the ability to think long-term and strategically is becoming increasingly important. The IMF's Managing Director points out that we are moving from a predictable world to one marked by greater uncertainty, higher economic volatility, and more geopolitical conflicts.<sup>19</sup> This shift requires a broader approach than just crisis management, as many of these challenges are more symptoms of profound changes in our societal and economic structures.<sup>20</sup> For example, the World Economic Forum shows that organizations need to improve their future thinking, systems thinking, and exponential thinking to meet the challenges ahead.<sup>21 22</sup> In several reports from sources such as Forbes<sup>23</sup> and World Economic Forum<sup>24</sup> creative thinking is also highlighted as one of the most important skills for

<sup>17</sup> The inspiration for the image comes from the World Economic Forum: [Why strategic foresight is essential for future preparedness | World Economic Forum](#)

<sup>18</sup> [Why strategic foresight is essential for future preparedness | World Economic Forum](#)

<sup>19</sup> [Navigating A More Fragile World | International Monetary Fund \(IMF\)](#)

<sup>20</sup> [Why strategic foresight is essential for future preparedness | World Economic Forum](#)

<sup>21</sup> [Why strategic foresight is essential for future preparedness | World Economic Forum](#)

<sup>22</sup> [Future of jobs 2023: These are the most in-demand skills now - and beyond | World Economic Forum](#)

<sup>23</sup> [The Top 10 In-Demand Skills For 2030 | Forbes](#)

<sup>24</sup> [Future of jobs 2023: These are the most in-demand skills now - and beyond | World Economic Forum](#)

2030, as it involves finding new ways to solve problems and envision improvements in a world where AI is unlikely to replace this ability. In a time of rapid change and digital transformation, the ability to think "outside the box" becomes crucial for developing innovative solutions to new and unexpected challenges.

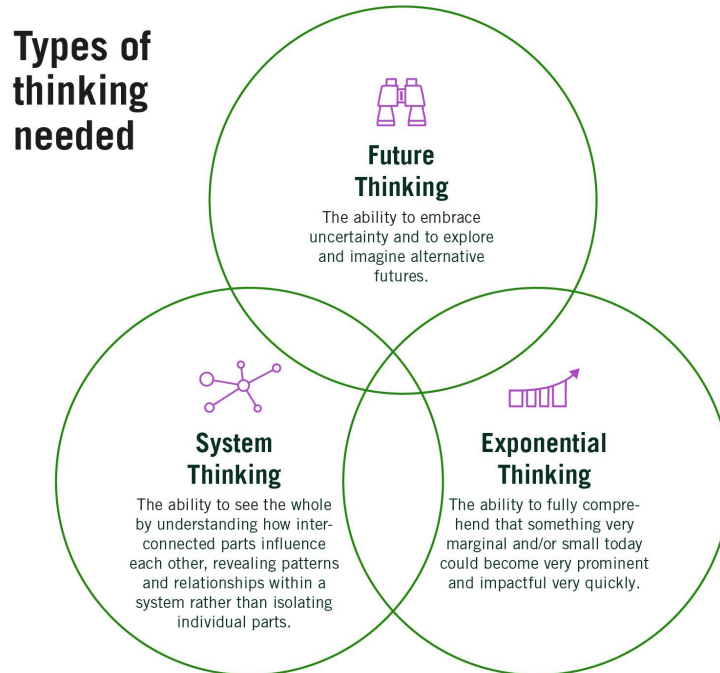


Illustration 3: Three types of thinking that help us understand and prepare for the complex challenges of the future.<sup>25</sup>

To meet future challenges, organizations and decision-makers need to develop their foresight capacity, or "futures literacy" – a key competence for navigating an uncertain future, according to the World Economic Forum. This systematic work with foresight includes integrating foresight tools into policy processes, education, and systems for continuous future analysis. As Arie de Geus puts it: "Managing internal change through foresight, rather than through crisis, is only possible if one detects the change in the external environment in time."<sup>26</sup>

Strategic foresight is about thinking outside traditional frameworks to identify and understand complex trends.<sup>27</sup> The purpose is not to predict a specific future, but to analyze various possible developments in order to support decision-making.<sup>28</sup> This is particularly relevant as 75 percent of companies are unprepared for the rapid pace of change within their respective industries<sup>29</sup>, and 40 percent of business leaders express concern about their organizations' survival without transformation.<sup>30</sup>

<sup>25</sup> The inspiration for the image comes from the World Economic Forum: [Why strategic foresight is essential for future preparedness | World Economic Forum](#)

<sup>26</sup> [Why strategic foresight is essential for future preparedness | World Economic Forum](#)

<sup>27</sup> [The Futures Toolkit | GOV.UK](#)

<sup>28</sup> [Strategic foresight | European Commission](#)

<sup>29</sup> [Corporate foresight and its impact on firm performance: A longitudinal analysis | ScienceDirect](#)

<sup>30</sup> [Thriving in an age of continuous reinvention | PwC](#)

Futures Literacy (FL) enables individuals to better understand the role of the future in decision-making and actions. Through FL, individuals can enhance their innovation capacity, improve their ability to prepare for changes, and develop new solutions when changes occur.

The EU and UNESCO are actively working to strengthen this competence through initiatives such as the [Competence Centre on Foresight](#) (CCFOR) and [Futures Literacy Laboratories](#). The work focuses on:

- Facilitating innovation processes and technology understanding
- Strengthening leadership capabilities and decision-making
- Increasing organizations' adaptability
- Promoting diversified approaches to risk management

The World Economic Forum argues that increased futures literacy globally can help reduce environmental degradation, economic crises, and inequalities, and suggests integrating FL into education systems and the workforce.<sup>31</sup>

### 1.4.3 Participation and Collaboration

In strategic foresight, the importance of collaboration and participation with stakeholders from various sectors of society, including public, private, and civil society actors, is emphasized. This inclusive approach is crucial for ensuring the legitimacy and impact of the foresight processes. By involving multiple perspectives, the conditions are improved for strategic decisions to be successfully implemented and for creating robust, adaptable strategies.

The same logic applies to system innovation, which aims to change entire systems rather than individual parts. Achieving this also requires an interdisciplinary perspective and engagement from stakeholders at all levels. The goal is to break down silos and create space for actors who typically do not collaborate to discuss common problems and solutions, resulting in a unified effort toward a shared goal.<sup>32 33</sup>

Although both strategic foresight and system innovation have similar goals and methods, these two areas are rarely integrated. Strategic foresight plays a key role in system innovation, especially in a time when the pace of change is accelerating and organizations struggle to adapt to new conditions.

By combining foresight and system innovation<sup>34</sup> we can better understand complex systems and how they change over time. This is essential for addressing major societal challenges and creating sustainable and innovative solutions. However, system innovation requires increased competence in future thinking, systems thinking, and exponential thinking (as highlighted in the previous section) within businesses, organizations, and the public sector.

The connection between strategic foresight and system innovation is based on several key points:

1. **Long-term overview:** By working with foresight, we can identify long-term challenges and opportunities that impact the functioning of the system.

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<sup>31</sup> [Why strategic foresight is essential for future preparedness | World Economic Forum](#)

<sup>32</sup> [Så arbetar Vinnova med systeminnovation | Vinnova](#)

<sup>33</sup> [Förutsättningar för systeminnovation för en hållbar framtid | Vinnova](#)

<sup>34</sup> [Introduktion till systemtänkande | ESV Forum](#)

2. **Improved perspective:** Foresight helps create the long-term thinking needed to drive deep systemic changes.
3. **Increased legitimacy:** Cross-sector collaboration strengthens the legitimacy of the changes required for system innovation.
4. **Pattern identification:** Using a systems perspective helps uncover underlying patterns and connections that are central to foresight work.
5. **Scenario planning:** By visualizing different future scenarios, we can develop strategies to manage complex system changes.
6. **Leverage points:** Foresight helps identify critical points where changes can have the greatest impact on the system.
7. **Adaptive governance:** Integrating foresight into innovation governance enables a more flexible and adaptable structure, which is crucial in times of uncertainty.

By integrating strategic foresight with system innovation, a solid foundation is created for understanding and developing solutions that are not only innovative but also aligned with societal development. This combined approach is essential for addressing global challenges and creating sustainable system solutions.

## 2. Our world is investing in strategic foresight

*As shown in the first part of the report, strategic foresight is a central tool to support governments and organizations in navigating future uncertainties and identifying and prioritizing areas such as technology fields.<sup>35</sup> In this second part of the report, we describe how some leading countries and organizations have integrated foresight into their strategic processes.*

### 2.1 Leading Innovation Countries Invest in Strategic Foresight

Länder som har etablerat effektiva framsynsfunktioner använder dessa för att analysera trender, skapa scenarier och förse beslutsfattare med insikter för att utveckla långsiktigt hållbara strategier som är flexibla och anpassningsbara. Ledande innovationsländer, som Finland, Singapore och Nederländerna, har framgångsrikt integrerat strategisk framsyn i sina innovationspolicyer för att identifiera framtida möjligheter och utmaningar. Nederländerna och Singapore har använt framsyn för att främja hållbar utveckling och teknologisk tillväxt.

In the report [The Future of Luxembourg's Economy by 2050](#), foresight is emphasized as a crucial method for formulating long-term strategies and goals for Luxembourg's sustainable future. Foresight has been used to engage society in the change process and ensure that strategies can be adjusted based on new insights and circumstances.

This compilation is by no means comprehensive, and there are several countries and organizations working with strategic foresight that are not mentioned in this report. Below is a selection of the most prominent examples.

### 2.2 Singapore

CSF's vision is to build a strategically agile public service, ready to manage a complex and fast-changing environment.<sup>36</sup>

Singapore has developed one of the world's most advanced strategic foresight systems through the [Centre for Strategic Futures](#) (CSF). From its roots in the Ministry of Defence in the 1980s, CSF has grown into a central unit under the Prime Minister's Office, crucial for the government's long-term planning.

The mission of CSF is to equip the Singaporean government for future challenges and opportunities. They achieve this by building capacity for strategic foresight and risk management, developing insights into future trends and potential surprises, and effectively communicating these insights to decision-makers.

- To fulfill this mission, CSF has developed 'Scenario Planning Plus' (SP+), a method that goes beyond traditional scenario planning to address unexpected

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<sup>35</sup> [Strategic Foresight | OECD](#)

<sup>36</sup> [Who We Are | Centre for Strategic Futures, Singapore](#)



trends and "black swan"<sup>37</sup> vents—unpredictable occurrences with significant impact. SP+ includes six core processes:

- Focus definition with the Cynefin framework
- Environmental monitoring through Emerging Issues Analysis
- Sense-making via Driving Forces and SWOT analysis
- Future development with scenarios and backcasting
- Strategy formulation through War-Gaming
- Monitoring with Early Warning Systems.

These processes help CSF categorize problems, identify critical trends, analyze the impact of potential events, create plausible future scenarios, simulate strategies, and track relevant indicators to identify potential threats in time. Through "Futures Conversations" CSF also engages leaders within public administration and collaborates widely through platforms such as the Strategic Futures Network and Sandbox.

Through this comprehensive work, Singapore aims to build a robust national capability to anticipate and effectively manage future challenges and opportunities, positioning the country at the forefront of global strategic foresight.<sup>38</sup>

## 2.3 The United Kingdom

Citizens rightly expect government policy that creates long-term benefits for society. To deliver this aim we need more than policy proposals which work well in the present context. We also need to understand what is changing beyond a policy area, how those changes might affect its impact, and how we might adapt policy proposals in response. (Sir Patrick Vallance Government Chief Scientific Adviser).<sup>39</sup>

The UK's foresight work is spread across the entire administration, with several departments having their own foresight teams or *Horizon Scanning teams*. Foresight efforts are driven and coordinated by a dedicated foresight team placed under the Department for Science, Innovation, and Technology within the [Government Office for Science](#) (GO-Science), which integrates scientific insights into policy development and advises the Prime Minister and Cabinet Office to ensure that excellent scientific advice is at the core of decision-making. GO-Science is operationally independent and works across the government to identify future technological and scientific trends, as well as analyzes how these trends affect national security, the economy, and society.<sup>40</sup>

Foresight and future thinking are integrated into several policy areas, including long-term strategies for sustainable development, innovation, and technological advancement. The Government Office for Science (GO-Science) provides a range of resources and services within the field of strategic foresight and future studies for the UK civil service to strengthen capacity in science and foresight. Their activities cover the following key areas:

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<sup>37</sup> "Black swans" is a term coined by Nassim Nicholas Taleb in his book *The Black Swan* (2007). It refers to unexpected events that have a significant impact and can be explained and justified in hindsight, despite being impossible to predict before they occur. Examples of black swans include the 2008 financial crisis, the September 11, 2001 terrorist attacks, and pandemics like COVID-19.

<sup>38</sup> [Who We Are | Centre for Strategic Futures, Singapore](#)

<sup>39</sup> [Government Office for Science: A brief guide to futures thinking and foresight | GOV.UK](#)

<sup>40</sup> [Government Office for Science | GOV.UK](#)

1. **Foresight Projects and Technology Scanning:** GO-Science conducts extensive [foresight projects](#) on major societal issues and develops tools such as GOSInsights, a web application where civil servants can access their data and analysis on emerging technologies. They also produce brief, accessible [technology overviews](#) for policymakers, helping government bodies make well-informed decisions on science and technology. The information comes from experts and global research analysis.<sup>41</sup>
2. **Resource Library:** GO-Science has created a wide range of resources to help civil servants apply future tools, including a futures studies toolbox, trend analyses, and guides for future thinking in policy development.
3. **Training:** GO-Science offers both online and in-person training for civil servants at all levels to introduce future thinking and develop foresight capabilities within the civil service.
4. **Networks:** GO-Science runs several networks, such as the Heads of Horizon Scanning Network and EmTech Community of Interest, to foster collaboration and knowledge exchange in futures studies and technology analysis.
5. **Advisory Services:** GO-Science holds monthly introductory sessions on futures studies and offers individual advice for specific projects.
6. **Procurement Framework for Future Services:** GO-Science has developed a framework that provides government agencies with easy access to a range of future-oriented services from various suppliers.
7. **Collaboration with Other Government Departments:** GO-Science collaborates with the Cabinet Office through the Foresight team in the Joint Data and Analysis Centre (JDAC) to support strategic long-term thinking in the government.

Through these efforts, GO-Science strives to integrate future thinking and strategic foresight across the entire UK civil service, from policy development to organizational development.<sup>42</sup>

The United Kingdom has a flexible preparedness system for scientific advisory in crises through the [Scientific Advisory Group for Emergencies \(SAGE\)](#). This expert group is activated when needed and gathers independent scientific expertise from the government, academia, and the private sector. SAGE has played a key role in the country's management of pandemics and other crises by integrating research-based analysis into the decision-making process.

## Wales

A future will happen whether we think about it or not but thinking about the long-term can help us navigate an increasingly complex and uncertain world in a way that reduces risk and unlocks opportunities. It can help us build resilience into our systems and get out of the constant 'firefighting' mode.<sup>43</sup>

Wales, through the [Well-being of Future Generations Act](#) of 2015, has taken a unique and globally recognized position in strategic foresight.<sup>44</sup> The law requires that public

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<sup>41</sup> [Building a shared understanding of emerging technologies – Futures, Foresight and Horizon Scanning | GOV.UK](#)

<sup>42</sup> [Futures, Foresight and Emerging Technologies | GOV.UK](#)

<sup>43</sup> [Long-term Thinking | The Future Generations Commissioner for Wales](#)

<sup>44</sup> [Well-being of Future Generations \(Wales\) Act 2015 | The Future Generations Commissioner for Wales](#)

decisions take into account the well-being of future generations. A central part of this initiative is the establishment of a dedicated commissioner, the [Future Generations Commissioner](#), whose role is to monitor compliance with the law and support the government's long-term strategies.

The commissioner and his team actively work to help the government and other public bodies make decisions that are long-term sustainable, taking into account three key dimensions: climate change, social justice, and economic sustainability. This is done by providing guidance and tools to integrate foresight into decision-making processes. For example, the commissioner offers a [Future Generations Framework](#), which helps organizations identify and analyze potential future challenges and opportunities, thereby supporting the development of robust strategies.

A concrete example of their work is the annual [reports](#) that evaluate how well different agencies comply with the requirements of the law. These reports include recommendations for improvements and highlight successes as well as challenges. By promoting transparency and accountability, the commissioner helps foster a culture of long-term thinking within the public sector.

The long-term thinking in Wales focuses on building societal systems that are resilient and adaptable to future changes. By integrating foresight into decision-making, Wales can better manage the complex challenges posed by climate change and social inequality, ensuring that future generations have the opportunity for a sustainable and just future.<sup>45</sup>

## 2.4 Canada

Good policy is based on great research. And great research is based on exceptional foresight. Horizons is a world leader in strategic foresight: Its approach is uniquely tailored for exploring change across the disciplines and into the next decade, and for thinking creatively about emerging policy challenges and opportunities therein. (Prof. Alex Wilner, Carleton University).<sup>46</sup>

Canada conducts its strategic foresight work through [Policy Horizons Canada](#), a federal organization that serves as the government's expert body for futures analysis. The organization is tasked with identifying future challenges and opportunities for Canada by analyzing global trends and their potential effects on national policy. Policy Horizons Canada uses foresight to help the federal government build stronger policies and programs in preparation for an uncertain future.<sup>47</sup> Policy Horizons Canada focuses on three main areas: economic futures, social futures, and governance-related futures. They develop future scenarios and policy recommendations that help the government design more robust and long-term strategies. By working closely with both academic and public institutions, they strengthen Canada's capacity to make well-informed and future-oriented decisions.<sup>48</sup> Policy Horizons Canada offers a range of training modules to support civil servants in better understanding foresight and how they can integrate foresight into policy processes.<sup>49</sup>

Policy Horizons Canada also hosts an annual [Futures Week](#), providing participants with the opportunity to explore emerging issues, the opportunities and challenges we may face, and how foresight can drive transformation. Futures Week is open to the public

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<sup>45</sup> [Future Generations Commissioner for Wales | The Future Generations Commissioner for Wales](#)

<sup>46</sup> [Home - Policy Horizons Canada](#)

<sup>47</sup> [Home | Policy Horizons Canada](#)

<sup>48</sup> [Our Work | Policy Horizons Canada](#)

<sup>49</sup> [Resources - Policy Horizons Canada](#)

and welcomes a diverse audience of civil servants, foresight practitioners, and anyone interested in future-focused topics, dialogue, and gaining new insights.

## 2.5 Finland

Climate change, an ageing population and technological development are transforming Finland and changing its outlook for the future. Many other social, technological, economic, environmental and political changes are also affecting our operating environment. Finland needs to prepare for the future and the uncertainty it brings. The Government's foresight activities aim to support decision-making by creating a shared understanding of the changes that lie ahead.<sup>50</sup>

Finland has a tradition of foresight work and has a unique structure for this within its parliament. Through the [Committee for the Future](#), Finland has a parliamentary committee that focuses on future issues, technology, and long-term policy development. The committee advises the government on future challenges and opportunities and works on reviewing reports on long-term strategies. Each parliamentary term, the government presents a report on future perspectives, which the committee then reviews and provides feedback on through a parliamentary future statement. The committee also works to evaluate innovations and technological advancements that could have long-term consequences for Finland. Their work aims to ensure that future political decisions are based on in-depth analysis and broad future scenarios.<sup>51</sup>

In Finland, foresight is used as a tool to develop long-term investments in technology and education, as well as to build a flexible innovation environment. Finland has also collaborated with the OECD to enhance its work on "anticipatory innovation governance," which helps the government address complex future problems by actively exploring and shaping alternative futures.<sup>52 53</sup>

## 2.6 The Netherlands

It is crucial that organisations are prepared for different future scenarios for the course of the Covid-19 pandemic. This can prevent them from being caught off-guard and having to take important decisions on an ad-hoc basis. In this advice, the WRR and the KNAW outline five scenarios offering approaches for the development of a coherent policy strategy.<sup>54</sup>

[Netherlands Scientific Council for Government Policy](#) (WRR) is an independent advisory body for government policy. Its task is to provide strategic policy advice based on science to the Dutch government and parliament on strategic issues that are likely to have significant long-term social and political consequences.<sup>55</sup> WRR does not focus on specific policy areas but on cross-cutting themes that require coordinated policies across different domains. Their work aims to highlight the long-term aspects of public policy as a complement to more short-term, current issues. They explore new perspectives and challenge existing assumptions in policy development through their reports, which are based on expertise from various scientific disciplines and stakeholders. WRR publishes advisory reports, policy briefs, and studies targeted at the government, parliament, and the public.<sup>56</sup> The government is required to respond to

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<sup>50</sup> [Foresight and work on the future | Finnish Government](#)

<sup>51</sup> [Committee for the Future | Finnish Government](#)

<sup>52</sup> [Finland has many opportunities to develop anticipatory innovation governance | Finnish Government](#)

<sup>53</sup> [Unlocking the Future: Anticipatory innovation governance in Finland | Observatory of Public Sector Innovation | OECD](#)

<sup>54</sup> [Navigating and anticipating in uncertain times | The Netherlands Scientific Council for Government Policy](#)

<sup>55</sup> [About us | The Netherlands Scientific Council for Government Policy](#)

<sup>56</sup> [Products | About us | The Netherlands Scientific Council for Government Policy](#)

WRR's reports within three months.<sup>57</sup> They also carry out important work to increase the impact of their publications through presentations, meetings, and further explanations of recommendations.<sup>58</sup> Two WRR publications that have had visible impact on government policy are [Navigating and anticipating in uncertain times](#), which provided the government with scenarios for future management of COVID-19, and [Why knowing what to do is not enough](#), which advises the Dutch government to take a realistic approach to individuals' mental capacity when designing rules and institutions.

Policy-makers tend to assume that the government need only provide people with clear information and that, once properly informed, they will automatically do the right thing. As is becoming increasingly obvious, however, this is not how it works in reality.

In response to the report, the government has committed to adopting a more realistic approach and implementing a "capacity to act test" for new policies. Both reports have led to commitments from the government to change its approach to policy development.<sup>59</sup>

## 2.7 EU

Changes in climate, increasing pace of technologies, or geopolitical shifts, are all examples of trends having a profound effect on the lives of Europeans. These transformations are taking place at all levels, from grassroots politics to global power structures. To anticipate and prepare for those changes and support the transitions to a green, digital and fairer Europe, the Commission is strengthening its culture of preparedness and evidence-based anticipatory policy-making. That is why the Commission invests in efforts to embed strategic foresight into its work.<sup>60</sup>

[The European Commission](#) has strengthened its foresight efforts by appointing a commissioner responsible for strategic foresight and establishing a dedicated team for this purpose. This work aims to integrate long-term thinking into the EU's policy development and ensure that the Union is prepared for future challenges such as climate change, digital transformation, and globalization. Since 2019, Executive Vice-President Maroš Šefčovič has led this work, with support from the Secretariat-General and the [Joint Research Centre \(JRC\)](#).

Central to this work is the [Competence Centre on Foresight](#), launched in 2018. It supports the EU's decision-making by:

1. Providing strategic and future-oriented insights
2. Developing a forward-thinking culture within the Commission
3. Conducting horizon scanning to identify early signs of change
4. Coordinating the ESPAS project for horizon scanning.

An annual [strategic foresight report](#) is published, providing an overview of key future issues. The Commission also works closely with other EU institutions and member states, including through the EU-wide network [Ministers for the Future](#).

President von der Leyen has emphasized the importance of integrating foresight and evidence-based decision-making into the EU's policy development, particularly to strengthen the EU's global position. The Competence Centre, which is part of the [EU](#)

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<sup>57</sup> [Independent position | About us | The Netherlands Scientific Council for Government Policy](#)

<sup>58</sup> [Task and position | About us | The Netherlands Scientific Council for Government Policy](#)

<sup>59</sup> [Impact | About us | The Netherlands Scientific Council for Government Policy](#)

<sup>60</sup> [Strategic foresight | European Commission](#)

[Policy Lab](#), plays a key role in promoting collaboration between the Commission's departments and developing a more forward-looking policy cycle.<sup>61</sup>

In this context, the recently published report [Safer Together – Strengthening Europe's Civilian and Military Preparedness and Readiness](#) by Sauli Niinistö (former president of Finland and current advisor to the European Commission) is of great importance. The report emphasizes the need for an ambitious and integrated strategy to address the complex challenges faced by the EU and its member states. It contains around 80 recommendations for both short- and long-term actions aimed at strengthening preparedness and the ability to manage future crises, further reinforcing the importance of involving both civilian and military actors in a comprehensive view of security.<sup>62</sup>

Worth mentioning is also [futures4europe](#), an online platform that serves as a gathering point for experts and organizations in foresight. It functions as a shared resource to exchange foresight projects, educational materials, and information about ongoing activities and events related to foresight. The platform aims to promote communication and collaboration within the foresight field. From November 2023, [futures4europe.eu](#) is part of the EU-funded project [Eye of Europe](#).<sup>63</sup>

## 2.8 OECD

Strategic foresight is not about predicting a single future. It is about the analysis of plausible futures, which can support better policy making. Rather than making predictions based on linear extrapolation of past and current trends, foresight cultivates the capacity to anticipate alternative futures and an ability to imagine multiple and non-linear possible consequences.<sup>64</sup>

[OECD](#) advocates for strategic foresight and long-term thinking as a central part of effective and modern decision-making. According to OECD, strategic foresight can help decision-makers improve government efficiency by identifying opportunities, challenges, risks, and disruptions that may arise in the coming years. OECD has a dedicated unit for strategic foresight that helps member countries develop foresight capacity and integrate future thinking into their decision-making processes. The Strategic Foresight Unit was established in 2013 to deepen and integrate foresight across all policy areas covered by the OECD and to support the strengthening of governments' foresight capacity. The unit works based on three objectives:

- Strengthen foresight capacity and practices within the OECD to improve political analysis and advice.
- Support government foresight capacity by leveraging networks such as the OECD's Government Foresight Community (GFC).
- Be forward-looking regarding the OECD's priorities and the global political debate.

Through networks such as the *Government Foresight Community*, the OECD supports its member countries with tools and methods to address future challenges and provide the conditions for better decision-making.<sup>65</sup>

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<sup>61</sup> [About the Competence Centre on Foresight | Knowledge for policy | European Commission](#)

<sup>62</sup> [Safer together: A path towards a fully prepared Union | European Commission](#)

<sup>63</sup> [About | Futures4Europe](#)

<sup>64</sup> [Strategic Foresight | OECD](#)

<sup>65</sup> [Strategic Foresight | OECD](#)

## 2.9 World Economic Forum

The World Economic Forum has developed the platform [Strategic Intelligence](#) as an example of how horizon scanning can be used within strategic foresight. The platform supports the organization's partners in both the private and public sectors, as well as a broader public, in exploring, understanding, and monitoring global, regional, and industry-specific trends and signals.

Strategic Intelligence gathers insights from a network of leading experts, universities, and international organizations, and complements these with machine-based analyses of over 1,000 articles per day from trusted news sources, think tanks, and research institutions. The platform's dynamic visual structure allows for identifying and explaining connections between different topics, creating a deeper contextual understanding for both the World Economic Forum's partners and for the organization's own work on a range of global issues.

The platform serves as an international example of how strategic foresight can be used to build long-term preparedness for future changes.

## 2.10 UN

Every "what if" sparks new ideas and drives us to create a better tomorrow. What if we embraced uncertainty and complexity with imagination? By exploring multiple futures, we gain fresh perspectives on present challenges and opportunities. We may not control uncertainty, but we can shape how we face it.<sup>66</sup>

[UN 2.0](#) summarizes the Secretary-General's vision of a modern UN organization with a forward-looking culture and new skills. The goal is to build a UN system that can better support member states by utilizing cutting-edge expertise, with foresight, innovation, data, digitalization, and behavioral science highlighted as critical competencies for the future.

[UN Futures Lab](#) is a global network that supports member states in managing increased uncertainty caused by global crises such as drought, species extinction, and the transition to renewable energy. In the 2021 report "Our Common Agenda"<sup>67</sup> it was proposed to establish the Futures Lab to improve preparedness for global risks and consider future generations. The vision is for the UN to transition from short-term reactions to long-term sustainable choices, and the mission is to support the development of foresight capacity and promote long-term vision in policies and programs.

The Lab aims to create a more resilient and forward-thinking UN by integrating long-term thinking into decision-making processes and combining foresight with areas such as data and innovation. Their global hub, like the OECD, works to provide expertise, guides, and tools to support decision-makers in their efforts to navigate uncertainties and anticipate future trends.

## 2.11 UNESCO

Being futures-literate empowers the imagination. It enhances our ability to prepare, recover, and invent in the face of change.<sup>68</sup>

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<sup>66</sup> [UN Futures Lab | United Nations](#)

<sup>67</sup> [Our Common Agenda | United Nations](#)

<sup>68</sup> [Futures literacy | UNESCO](#)



Since 2012, [UNESCO](#) has been an advocate for Futures Literacy, a competence aimed at helping individuals understand the significance of the future in decision-making and policy development. By conducting over 110 Futures Literacy Laboratories (FLL) in 44 countries, UNESCO has provided structured learning experiences where participants explore various future scenarios. These laboratories enable individuals and communities to reconsider the present, promote a diversity of futures, and strengthen creativity and agency. Through this work, UNESCO aims to enable sustainable solutions in key areas such as technology, climate, and social justice, thereby contributing to a more inclusive and resilient world.

# 3 Future-Proofed Policy Development

*Strategic foresight is an important part of strategic work within the public administration. It involves systematically analyzing future opportunities and challenges to make well-informed decisions today. A key application of strategic foresight is to "future-proof" policies. This means designing policies that not only address today's needs but are also robust enough to meet the unpredictable challenges of the future.*<sup>69</sup>

## 3.1 Critical Aspects of Foresight Work

A critical aspect of foresight work is to go beyond the "surprise-free future".<sup>70</sup> As the [Observatory of Public Sector Innovation](#) (OPSI) emphasizes, we often believe that the future is predictable, but it is in constant flux, shaped by many different factors. Therefore, policies should not simply assume that trends are fixed, but instead question their origins and how they may evolve over time.<sup>71</sup>

According to the World Economic Forum, experience shows that two factors are crucial for organizations to work with strategic foresight. First, strategic foresight must be supported by top management and decision-makers, which means dedicating time and resources and being willing to reconsider strategic decisions based on insights from foresight work. Second, the most successful organizations are those that democratize foresight, viewing it as a skill and culture that permeates the entire organization rather than just a central unit. Foresight helps strengthen organizations' preparedness for the future through exploration, strategic direction, innovation, and vision.<sup>72</sup>

In discussions about technology, misunderstandings often arise about how it impacts the future. It is easy to focus on the tools themselves and their technical development, but technologies such as typewriters and toasters have not been created or developed in isolation from the societies they exist in. To understand how, for example, artificial intelligence can transform the role and functions of states, it requires more than just following the development of the technology. It is also crucial to analyze how the technology is used, how societies respond to it, and the values behind its use. For instance, it is not the existence of social media itself that influences public debate, but how they are structured and how people use them. Technology alone does not provide sufficient insight into the future or how we can adapt to it. Therefore, policy development should not only focus on technological progress but also on the societal values and motivations that shape and respond to these technologies, as well as how they impact our democracies.<sup>73</sup>

Technology and humans therefore shape each other in a mutual process. While we shape technology, it also influences how we act and think. This concept, often called "co-shaping" or co-creation relationships, means that it is not enough to just analyze the development of technology or its use in isolation. For a deeper understanding of future

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<sup>69</sup> [Anticipatory Innovation - Observatory of Public Sector Innovation | OECD](#)

<sup>70</sup> [Exploring Futures for Policymaking | Publication | The Netherlands Scientific Council for Government Policy](#)

<sup>71</sup> [Foresight Fast and Slow: Anticipation as a force for democracy in our times - Observatory of Public Sector Innovation | OECD](#)

<sup>72</sup> [Why strategic foresight is essential for future preparedness | World Economic Forum](#)

<sup>73</sup> [Foresight Fast and Slow: Anticipation as a force for democracy in our times - Observatory of Public Sector Innovation | OECD](#)

technology and its role in society, we must also examine how our relationships with technology continuously reshape us as individuals and societies, and how we thus collectively develop the systems we live in. We should, therefore, design policies that take into account both technological progress and the human response to it.

In connection with policy development, strategic foresight is invaluable for creating resilient strategies by, so to speak, "stress-testing" them before they are decided. By identifying changes, uncertainties, and their potential consequences, decision-makers can create more informed and flexible action plans. Moreover, strategic foresight emphasizes the importance of involving a diversity of perspectives to ensure that future scenarios are not only realistic but also include the experiences and needs of various stakeholders. Actively involving these stakeholders in the process can lead to greater legitimacy and better-grounded decisions.<sup>74</sup>

### 3.2 Anticipatory Innovation Governance (AIG)

Strategic foresight is "designed to inform policymakers but not support them in engaging with a deliberative process". For this, it is necessary to implement institutional functions (e.g., budgetary and legislative) and mechanisms (e.g., legitimacy and organisational capacity) in order to create demand and provide the necessary mandates to craft policy responses with foresight interventions.<sup>75</sup>

The OECD has developed a framework for proactive and future-oriented governments, called Anticipatory Innovation Governance (AIG).<sup>76</sup>

This model aims to help governments manage uncertainty and future challenges by building the capacity to actively explore possible futures, experiment, and continuously learn.<sup>77</sup> AIG emphasizes the importance of linking future knowledge with current policy measures, thus reducing the gap between insight and action.<sup>78</sup> This approach goes beyond traditional governance, which often focuses on reacting to predictable problems, and instead creates systems that allow for proactive engagement with complex and uncertain future issues. AIG integrates strategic futures studies into decision-making and policy development, with the aim of ensuring that governments not only prepare for future challenges but also actively shape the future through innovation and long-term strategy.<sup>79</sup>

In the OECD report [Anticipatory Innovation Governance](#), the need for a new form of governance is explored, one that enables governments to proactively manage uncertainty and complex problems through innovation. Traditional reactive methods, according to the report, are ineffective in a rapidly changing world, and therefore a more future-oriented approach is suggested, where innovation and experimentation are used to both anticipate and shape the future. Anticipatory innovation governance is defined as a forward-looking governance approach that not only creates knowledge about uncertain futures but also actively shapes and prepares for them through innovation. It is about integrating innovation processes into governance to manage uncertainty and complexity by experimenting, exploring alternatives, and using new tools and methods to steer towards desired outcomes.

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<sup>74</sup> [The Futures Toolkit | GOV.UK](#)

<sup>75</sup> [The Triple Challenge of Embedding Strategic Foresight in Government - Observatory of Public Sector Innovation | OECD](#)

<sup>76</sup> [Anticipatory Innovation - Observatory of Public Sector Innovation | OECD](#)

<sup>77</sup> [Anticipatory-Innovation-Governance-in-Finland | OECD](#)

<sup>78</sup> [The Triple Challenge of Embedding Strategic Foresight in Government - Observatory of Public Sector Innovation | OECD](#)

<sup>79</sup> [Anticipatory-Innovation-Governance-in-Finland | OECD](#)

AIG is implemented through several mechanisms and practical steps. Governments are encouraged to continuously explore alternative policies and test different solutions through real-world experiments to identify which actions are most effective. This involves iterative processes where lessons are quickly learned from the outcomes and efforts are adjusted accordingly.

In addition, the importance of *sense-making* is emphasized, which involves understanding and interpreting signals about future trends and uncertainties to shape policy decisions. By gathering and interpreting data and weak signals from the environment, decision-makers can better navigate complex settings. The report also suggests using specific tools and methods, such as future scenarios, systems thinking, and simulation models, to effectively manage uncertainties. These methods support decision-making by visualizing potential futures.

To manage complexity, organizations can build capacity and promote a culture of learning and experimentation, as well as develop skills in systems thinking and innovation. Creating flexible and adaptable institutional structures is crucial for enabling experimentation and long-term planning, which includes ensuring a political and institutional environment that supports innovation governance.

Finally, the report emphasizes the importance of embedding continuous feedback loops in policy processes to constantly learn from experiments and adapt to new conditions. Three types of feedback loops are highlighted as strengthening a dynamic and adaptable policy process:

1. **Monitoring and Adjustment Feedback** to continuously track policy outcomes and make necessary adjustments.
2. **Accountability and Control Feedback** to ensure transparency and coordination among different stakeholders.
3. **Learning Feedback** to enable learning from policy outcomes and the adaptation of strategies based on new challenges.

These steps aim to create a more dynamic and proactive policy development process that is better equipped to handle future uncertainties and rapid changes.<sup>80</sup>

### 3.3 International Examples of Integrating AIG

A concrete example of incorporating feedback loops into policy processes is Spain, which in January 2020 established the foresight unit *The National Office for Prospective and Long Term Country* within the Prime Minister's Office following the formation of a coalition government. The unit was inspired by similar foresight units in Canada, the USA, France, Finland, and the UK, and was created to address structural issues in Spain over the next 30 years, such as climate change and urbanization. The goal is to counteract short-termism in democratic governance, where urgent issues often overshadow important matters, legislation quickly becomes outdated, and the pace of societal change increases.

The foresight unit will explore potential demographic, economic, geopolitical, social, and education-related challenges and opportunities in the medium and long term, helping the country prepare for these. The decision to establish the unit demonstrates a strong commitment to incorporating foresight capacity and foresight into decision-making processes at the national level. Furthermore, the Spanish foresight unit legitimizes

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<sup>80</sup> [Anticipatory innovation governance: Shaping the future through proactive policy making | OECD](#)

foresight as a strategic method for Spain and the previous units in other countries that inspired the creation of the office.<sup>81</sup> Working to anticipate and adapt policies over time is based on principles similar to feedback loops, where policies can be adjusted and improved based on new insights and future scenarios.

As part of building capacity for UK civil servants to adopt strategic foresight and thus work with anticipatory governance, the Government Office for Science in the UK has developed an extensive toolkit, the [Futures Toolkit](#). This aims to promote long-term strategic thinking in policy work. The toolkit provides civil servants with practical methods for managing uncertainty and integrating future analysis into decision-making processes. The toolkit includes a "Trend Deck" with material on long-term changes, guidance on futures thinking, and case studies from both the public and private sectors.

The toolkit is designed to be used at various stages of policy development, from initial analysis and strategy testing to implementation and evaluation. For example, tools such as "Policy Stress-testing" and "Scenarios" are used to test the resilience of strategies and policies under different future conditions. The "SWOT analysis" is useful for analyzing internal and external factors that could affect policy outcomes and can be integrated into specific steps, such as risk assessment. In this way, it enables UK civil servants to better anticipate and prepare for future challenges and opportunities in policy development.

The toolkit also provides "pathways", which combine various tools to meet specific goals, such as creating a shared future vision or building futures knowledge when mapping out a future challenge. Each "pathway" is tailored to different work processes and policy needs, allowing the tools to be used flexibly depending on purpose and context.

To ensure that all relevant stakeholders are included in the process, the tools promote broad participation and diversity of perspectives, such as through "Seven Questions" interviews and horizon scanning. These methods encourage involving both internal and external stakeholders, as well as subject-matter experts at different stages, to capture diverse viewpoints on future challenges and opportunities. Additionally, the toolkit is accessible and adaptable for both beginners and experienced users through case studies and approaches that facilitate practical application regardless of experience level.<sup>82 83</sup>

### 3.4 Strategic foresight to ensure policies that benefit future generations

Ensuring that future policies not only meet current needs but are also aligned with global sustainability goals is a central aspect of strategic foresight. Long-term thinking is fundamental to strategic foresight, and in the report [How to reflect the interests of future generations in today's decisions](#) by Geoff Mulgan and Robyn Bennett, the importance of institutionalizing this through specific roles such as future generations commissioners is emphasized. These commissioners are tasked with working with science-based foresight to ensure that the policies adopted protect the interests of future generations. Countries such as Wales, Finland, and New Zealand have led the way by creating laws and institutions that support long-term perspectives in decision-making. As mentioned earlier, Wales has implemented the *Well-being of Future Generations Act*

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<sup>81</sup> [Anticipatory innovation governance: Shaping the future through proactive policy making | OECD](#)

<sup>82</sup> [Futures, Foresight and Emerging Technologies | GOV.UK](#)

<sup>83</sup> [Government Office for Science: The Futures Toolkit | GOV.UK](#)

and a Future Generations Commissioner whose role is to ensure that sustainability goals are integrated into all levels of decision-making.

Integrating sustainability into strategic foresight requires a deep understanding of potential future challenges and opportunities, and considering the planetary boundaries to ensure that policies are made within the Earth's ecological limits. It is also important to engage various stakeholders, including civil society, business, and academia, to gain a broader insight into the complex interconnections between social, economic, and environmental factors. Furthermore, innovative public governance is needed to adapt institutions and organizations to complex and dynamic environments in order to effectively manage rapidly changing sustainability challenges. By creating synergies between global sustainability goals, such as the UN Sustainable Development Goals (SDGs), and national and local policies, a unified strategy for a sustainable future can be promoted. By integrating these aspects into strategic foresight, decisions made today can not only address current challenges but also ensure a sustainable and just future for upcoming generations.

# 4 Strategic foresight as an enabler for innovation in Sweden

*Market research shows that when foresight is well institutionalized, it can become a tool for developing innovative and sustainable solutions to future challenges. This section provides examples of how some Swedish actors work with strategic foresight, their motivations, and how this work is connected to innovation.*

## 4.1 Foresight as a driver for innovation

Strategic foresight not only functions as a tool for risk management but also as a catalyst for innovation. By exploring different future scenarios, organizations and countries have the opportunity to see trends, challenges, and opportunities, creating a framework where new ideas can thrive. This can foster an innovation culture both in business and in policymaking, where entrepreneurs and decision-makers are encouraged to think creatively and proactively about future challenges and opportunities. As demonstrated in the previous section, strategic foresight is used by several leading innovation countries to anticipate and manage future challenges and opportunities.

Foresight has the potential to be a catalyst that leads to innovations that are more robust and better adapted to meet future challenges. For example, scenario planning and the analysis of weak signals provide a foundation for fostering a culture of proactive future thinking and long-term strategies. Vinnova and Formas are particularly committed to using foresight methods to create dialogue and promote a more inclusive innovation system, where various stakeholders can collectively influence the futures they want to see.

This collaboration between public and private actors, with the involvement of civil society, makes the foresight process a democratizing tool for exploring and engaging with different future perspectives. Future prototypes and speculative design are used to make innovative solutions accessible and inspire solutions that have the potential to enhance Sweden's preparedness for various future scenarios.

## 4.2 Examples of Swedish actors in foresight

Sweden has a growing awareness of the importance of strategic foresight, particularly within sectors such as defense, high-tech industries, and innovation. Examples of **businesses** in the private sector that work with strategic foresight include **Scania**, **Saab**, and **Ericsson**. Scania has a well-developed foresight function focused on future transport solutions and particularly uses foresight to gain insights into and plan strategically for future competency needs. They collaborate with AI Sweden to integrate AI into digitized and sustainable transport. There are also several consulting firms that actively support both businesses, the public sector, and civil society with strategic foresight.

[The Institute for Futures Studies](#) is an interdisciplinary research foundation that focuses on issues affecting our future society, based on insights into how we impact future generations. By promoting long-term perspectives and relevant research, the institute works on topics such as climate ethics, technology, and societal challenges, creating a dynamic environment where researchers from different disciplines collaborate. Additionally, the institute stimulates an open discussion on future threats and



opportunities through seminars and publications, contributing to a broader understanding of societal development.

Some **higher education institutions** and organizations, such as [Stockholm School of Entrepreneurship](#) and [Mälardalen University](#), offer courses in strategic foresight and how it forms a relevant part of the innovation process and is of significant importance for entrepreneurs. Both [Hyper Island](#) and [Karios Future](#) offer courses that provide participants with tools to integrate future thinking into strategic work aimed at decision-makers and innovation leaders, among others.

**Research institutes** such as [RISE](#) and [FOI](#) work with strategic foresight. RISE works with foresight linked to sustainability and transitions towards climate-neutral and circular systems, technology, and business, but also uses foresight analytical methods related to other transitions such as digitalization, industrial restructuring, demographic changes, behavioral changes, and more. **RISE** conducts larger future studies focusing on environmental analysis to map the current situation, trend analysis to understand what is on the horizon, and scenario analysis to create multiple images of how the world might develop. The results from a foresight process are used in further work with strategy and roadmaps. **FOI** carries out extensive environmental analyses and strategic foresight in defense and security. For example, they have recently published a foresight report [Exploring future technology development](#) with four scenarios about the digital information environment in 2050, focused on non-state actors. The purpose is to contribute to the Swedish Armed Forces' long-term outlook (Perspectives Study), and they have used the UK's [Futures Toolkit](#).

**Government agencies** such as **Sida**, **Vinnova**, and **Formas** have embraced strategic foresight within their organizations.

[Sida](#) conducts strategic foresight through its innovation lab, which supports demand-driven development and innovation to accelerate progress towards Agenda 2030. Over the past three years, the lab has used foresight in various contexts, leading to several hundred employees formulating their own future visions.<sup>84</sup>

[The Swedish Innovation Agency, Vinnova](#), works to integrate foresight with innovation to drive sustainable solutions to complex societal challenges. The goal is to strengthen foresight capacity in the innovation system and help actors make more future-proof strategic decisions. To achieve this, Vinnova has launched several capacity-building initiatives. One example is the [foresight residency program](#)<sup>85</sup> an initiative aimed at public organizations that need to understand and act on future issues.

Vinnova has also funded [projects](#) aimed at strengthening the ability to imagine and understand different futures, as well as creating dialogue to act more strategically within areas such as food and mobility systems. These projects use a range of foresight methods, such as identifying and analyzing signals and patterns, scenario writing, future prototypes, and speculative design<sup>86</sup> (a design methodology for exploring possible future scenarios, stimulating creative thinking, and broadening perspectives within innovation work). By linking strategic foresight to systems innovation, Vinnova strives to prepare Sweden to meet future societal challenges, with a focus on sustainable development.

In the recently submitted report on the Government Assignment "*Strategic Technologies for Sweden*," Vinnova highlights the need for an ongoing process for national technology priorities, with the aim of creating a strategic technology policy direction for Sweden.

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<sup>84</sup> [Foresight \(strategisk framsyn\) | Kompetensnätverk](#)

<sup>85</sup> Residens används för att öka utbyte av kunskap, skapa samarbeten, utveckla nya idéer och produkter men även för att ge utrymme för reflektion, nya influenser och utforska den egna verksamheten i en ny kontext.

<sup>86</sup> Läs mer om spekulativ design på Vinnovas hemsida: [Vad är spekulativ design | Vinnova](#)

Vinnova proposes that the foundation for this work be deepened, continuously updated, and reported at least every two years. In times when both technological development and geopolitical changes may alter fundamental conditions for future development, methods for strategic foresight represent an important component of the in-depth analysis that is planned.<sup>87</sup>

[Formas](#) works strategically with environmental monitoring and foresight to improve the agency's future preparedness, as well as to design research and innovation initiatives based on current and future societal needs. The work on environmental monitoring has two main goals: to support forward-looking efforts and to promote knowledge exchange within the agency. All employees gather environmental scans, which are analyzed and used to prioritize annual work efforts, budget planning, and long-term strategic development. Foresight activities are carried out based on needs. For example, Formas produced a foresight report as input for their contribution to the upcoming research and innovation bill. Formas also actively works to strengthen foresight competency within the organization, through inspirational lectures and by having the team leading Formas' environmental monitoring work undergo training in foresight methodology. By participating in environmental networks and sharing insights with other organizations, Formas contributes to a broader knowledge exchange on foresight work.

Even some **municipalities** are starting to recognize the value of strategic foresight. For example, **Tomelilla**, [Kungsbacka](#), **Helsingborg**, and **Kristianstad** are testing foresight methodologies. [RegLab](#) (a forum for learning about regional development where regions, authorities, researchers, and others meet) has carried out a major initiative to increase knowledge of foresight methodology and long-term environmental analysis.

A relatively new initiative in Sweden is also [Futures Sweden](#). It is an open network aimed at developing and democratizing foresight as a method to better understand, anticipate, and shape the future, as well as create conditions for innovation and inspire action for a better future.

### 4.3 Motives for working with strategic foresight

Swedish actors have different motives for using strategic foresight, but a common goal is to strengthen society's long-term resilience and ability to meet future challenges. For public authorities, including research funders like Vinnova and Formas, foresight is both a tool for anticipating and managing risks as well as for contributing to sustainable transitions in critical societal areas such as climate and health. In the business sector, the purpose is often to identify trends and technological shifts in order to ensure innovation capacity and strengthen global competitiveness.

Foresight is also a powerful tool for democratizing and making the future more accessible. Foresight processes can create a platform for dialogue, where different types of actors have the opportunity to discuss the future together. By making the future accessible to more people, these actors aim to encourage both public and private interests to work together towards the futures we want to see.

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<sup>87</sup> Read more in section 3.7.2 "Further assignments" in the report [Strategic Technologies for Sweden](#)

## 5 Concluding remarks

Research and international comparisons show that strategic foresight can be a powerful tool that, when properly implemented, can strengthen resilience, drive innovation, and ensure long-term sustainability.

One dimension that is crucial in this context is the lack of intentional strategic processes in Sweden, where strategic foresight is demanded and systematically used. This results in foresights often becoming engaging "stories about the future" with low strategic impact. When such organization is absent or weak, the demand for and resources for strategic foresight (analysis, evaluations, etc.) are limited, resulting in efforts that quickly lose momentum and do not produce lasting results. This became clear in the two major "technical foresights" conducted in Sweden in the late 1990s.<sup>88</sup>

Sweden has begun working with strategic foresight, but in terms of strategic institutionalization for policy development, Sweden is a weak case in this regard. Compared to the countries mapped, particularly Singapore, it is clear that Sweden risks falling behind in competitiveness, as we lack institutionalized tools to anticipate what lies ahead. As Singapore has stated, the strategic institutionalization of foresight is necessary to be a leading innovation country. It is therefore important to link foresight to concrete policy development if Sweden is to remain a leading innovation nation.

Investing in foresight means building a deeper understanding of both opportunities and risks, and creating structures that enable rapid adaptation in uncertain times. The capabilities and processes offered by foresight work can create more proactive organizations that are ready to face future scenarios and contribute to Sweden's long-term competitiveness and preparedness. Such development could increase coordination between sectors and contribute to a flexible and innovative societal structure.

To fully realize its potential, Sweden needs to anchor foresight in its institutions in a way that builds competence and adapts the process to our national conditions. Developing foresight competencies within government agencies can increase ownership of foresight work and provide better support for research and innovation priorities.

Strategic foresight should function as an integrated and cross-sectoral process, where government agencies, business, academia, and civil society actively collaborate on future issues. By building capacity for foresight, adaptable strategies can be developed that not only address current challenges but also prepare Sweden for future uncertainties and opportunities.

To promote innovation and strengthen Sweden's societal preparedness, the following are proposed:

- **Capabilities and competencies for foresight:** Build expertise in areas such as scenario analysis, risk assessment, sustainability, and adaptive planning. Education and training in these capabilities will be central to navigating future challenges and developing proactive strategies.
- **Interactive and continuous foresight:** Develop structures that promote ongoing dialogue and analysis of future opportunities and risks. An interactive process where different actors contribute their perspectives can build foresight capacity,

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<sup>88</sup> Lessons from this work have been drawn in the book "Preparing for Progress," where the author also compares similar processes in companies such as Ericsson and Philips. [Preparing for Progress: Göran Pagels](#)

leading to ripple effects and creating a more nuanced and sustainable foresight effort that is flexible enough to handle complex issues.

- **Organization for purposeful strategic processes** where strategic foresight is requested and systematically used (similar to the UK and Singapore).
- **Processes for strategic analysis and decision-making:** Implement processes to identify, analyze, and integrate normative future perspectives into decision-making processes. This ensures that decisions are not only reactive but also forward-looking and aligned with long-term goals and sustainability requirements.
- **Increased responsibility for authorities:** Authorities should initiate, lead, and own their own foresight processes and request analyses to meet their specific needs and prioritize the right actions. By creating internal ownership among the agency's directors-general, strategic foresight can become a natural part of the public administration's strategic development.

By strengthening a future-oriented culture and building long-term processes, Sweden has a unique opportunity to shape a sustainable and desirable society through strategic foresight. With increased foresight capacity and proactive future thinking, Sweden can better meet a rapidly changing global environment that demands both flexibility and long-term sustainability.

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