Mapping

Foresight in governments – practices and trends around the world

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Introduction

This study provides the initial results of a survey of foresight activities undertaken by a select group of governments around the world.

The study was begun following the recent initiative by European Union (EU) institutions to build a joint foresight capacity (European Strategy and Policy Analysis System – ESPAS) that assesses long-term global trends to help them strengthen policy planning. In addition to contributing to the discussion about this new EU activity, the study is also intended to be of interest for the wider European policy planning community and to anyone interested in learning about how governments practise 'the art of the long view' (Schwartz, 1991).

This study looks at the way governments approach foresight, the issues they try to grapple with and the challenges they face in connecting foresight and policy. Its focus is on foresight exercises that look ten years or more into the future. The study does not include within its scope foresight activities undertaken at the initiative of business, academic or non-governmental organisations, though some government-led activities do involve these other actors.

Foresight work includes a range of activities related to the production of knowledge about possible futures. This knowledge is not of *the* future, nor *any* real future, but rather 'the manufactured knowledge of [a] restricted number of possibilities' (Sardar, 2010). The output of foresight work very often involves the creation of scenarios for the future which can be analysed for their likelihood and potential impact. Fore-

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sight also commonly uses practices such as 'trend impact analysis', 'horizon scanning', or the *Delphi method* (see Box 1).

This study presents an initial *tour d'horizon* of a limited number of countries who undertake foresight activities: Australia, Brazil, Canada, China, Finland, France, Germany, India, Indonesia, Italy, Japan, Mexico, the Netherlands, Norway, Russia, Singapore, South Africa, South Korea, Sweden, Switzerland, the United Kingdom (UK) and the United States (US). The countries were chosen to represent a diverse selection of countries based on location, economic profile, power status and political regime. The analysis is based on desk research and interviews conducted with professionals in government, academia and think tanks. This study also looked at the foresight activities of a range of international organisations with mandates for public service and which interact with governments as sources of knowledge and policy advice. As foresight activity tends to be scattered across departments and not always made public, it was not possible to be exhaustive in our analysis of the countries in this study. Time constraints and language barriers may also have affected the outcome of the study.

The first part of the study identifies the main issues that governments grapple with and offers a preliminary historical overview to shed light on current practice. The second part compares the approaches to foresight taken by governments and the institutional setting for foresight activities. The third part tries to assess the conditions for fruitful foresight.

The quest for oracles

In order to understand what foresight is today, it is useful to delve into its history. Whereas rulers and governments have always had recourse to oracles, astrologers and other crystal ball-type methods of peering into the future, the professionalisation of foresight activity (under various names) can be traced to World War II and its aftermath. Military in its origin, the art of studying the future has spread to a greater number of areas, not least thanks to the contribution of intellectual movements operating outside established technocracies, and the transformation of the role of the state in recent decades.

Leviathan: from naked survival to economic competition

The first concern of government is ensuring the survival of the state itself. In that context, it is vital to know your enemy as well as yourself.

The American and Cold War origins of contemporary foresight

During World War II, the American military establishment developed analytical capacities to anticipate possible events. They studied not only military events, but anything that could affect military affairs, such as technological, demographic and political trends. The focus was completely on how to win the war. After World War II, foresight activities were shaped by the tensions of the Cold War and the threat of nuclear annihilation. Foresight activities were highly focused on 'strategic' issues related to national survival.

A ground-breaking role was played by the RAND Corporation. The world's first 'think tank' (Missiroli and Ioannides, 2012), RAND was created by the American government in the 1940s but later became more independent while remaining at the heart of the American 'security political nexus' (Anderson, 2012). It developed the famous *Delphi method* (see Box 1), built big datasets and used scenario building, the bread and butter of foresight work. RAND has played a significant role in shaping modern foresight, developing game-theoretical models of decision-making and military scenarios, not least under the lead of nuclear-age theoretician Herman Kahn.

Expansion to Europe and the USSR

In Western Europe, foresight was developed from the bottom up in the 1950s and 1960s thanks to highly active and networked academics in France, Italy, the United Kingdom (UK) and Germany. With the support of the US Ford Foundation and the Congress for Cultural Freedom, intellectuals like Bertrand de Jouvenel, founder of the Futuribles association and journal, could finance some of their activities. The motivation of many of these individuals was not security-linked (see more on this below), but foresight in military affairs also became a normal government activity, especially in France and the United Kingdom.

Foresight work also took place in Central and Eastern Europe beginning in the 1960s and 1970s. The Soviet Union developed foresight capacities during the Cold War, not least as a response to American foresight work. In the early 1970s, the scholar Igor Bethuzev-Lada introduced Western foresight methods in the USSR, though little is known of the process and the content of Soviet efforts, which were mostly classified. Russia today has maintained a capacity for foresight studies via the Institute of World Economy and International Relations (IMEMO).

From confrontation to economic competition

The failure to anticipate the Vietnam War or how it was fought (via conventional and guerrilla warfare rather than a nuclear exchange), the social movements of the 1960s, and the oil shocks, economic crisis and Cold War *détente* of the 1970s all led to a diminished standing of, and declining interest in, military-centred foresight on strategic issues. After a temporary revival in the 1980s, interest in military foresight work waned following the end of the Cold War so that some scholars feared for its future. One wrote: 'a spectre is haunting strategic studies – the spectre of peace' (Betts, 1997). Military-centred foresight was losing standing at the same time as governments placed less emphasis on military issues in the race for international pre-eminence. Increased interest in economic competition became an overarching concern.

Box 1 - Key methodologies in foresight

A variety of foresight methodologies are used, individually or in combination, often to feed into a scenario-building process. Key methodologies include:

The Delphi method

The Delphi method is about constructing consensus among experts on predictions concerning a specific issue. It involves a structured and iterative process of brainstorming, generally with a series of questionnaires sent to selected experts in order to collect their predictions on various trends. This iteration usually leads to a consensus forecast, as expert opinions converge. A monitor filters and analyses the questionnaires to minimise interaction among the participants. The Delphi method promotes scenario development and helps multidisciplinary efforts to identify trends.

Horizon scanning

Horizon scanning is about detecting early signs of potentially important developments via systematic examination of potential threats and opportunities. It puts emphasis on new technology and its effects on the issue at hand. The method aims to filter out what is constant, what changes, and what constantly changes. It explores new issues as well as persistent problems and trends, including matters at the margins of current thinking that are likely to challenge past

assumptions. Horizon scanning is a good first step in assessing trends to feed into a scenario development process.

Trend impact analysis

Trend impact analysis extrapolates historical data into the future, while taking into account unprecedented future events. It involves systematically examining the effects of possible future events likely to affect the trend that is extrapolated. The events can include technological, political, social, economic and value-oriented changes. Expert opinions are used to identify future events that might cause deviations from the surprise-free projection and calibrate their likelihood and potential strength. Trend impact analysis provides a solid basis for building scenarios.

Different ways of approaching foresight

Normative vs. exploratory foresight: Normative foresight asks: what future do we want? Exploratory foresight explores what is possible regardless of what is desirable.

Qualitative vs. quantitative foresight: Qualitative ('soft data' such as interviews, discussions, reports) and quantitative ('hard data' such as figures and statistics) information can be combined and help orient, for instance, a scenario approach, thereby combining creativity with rigour.

Source: OECD website (modified)

The international environment today appears less based on confrontation among states, but on the competition of economic territories for capital and grey matter. The power of globalisation is such that the foresight undertaken by global business and financial actors influences directly how governments think and act. The 2003 forecast by Goldman Sachs that the economies of the BRIC countries (Brazil, Russia, India and China) would together, by 2050, be larger than those of the G-6 (the US, Germany, Japan, the UK, France and Italy), is the global forecast that has probably most focused minds and influenced governments in the last decade. It even contributed to the creation of a BRICS coalition (including South Africa) whose strategic interests diverge strongly, but who reject Western dominance of the established international order. This rejection has not been expressed through the use of force but through cooperative economic action, such as the planned establishment

of a joint development bank to contest the pre-eminence of Western-dominated Bretton Woods institutions.

Homo economicus: from planning to chasing technology and innovation

Macro-economic forecasting is a long-established practice which gave a significant impetus to the development of modern foresight activities.

Developing and expanding beyond macro-economic forecasts

Macro-economic forecasting has its origins in the first attempts at economic planning during the interwar period and was developed more systematically after World War II. The dominance of Keynesian macroeconomics in economic policy until the 1970s led to a build-up of dataset-based forecasting. Macro-economic forecasting, however, does not seek to look beyond more than a few years, and its limitations were revealed during the era of stagflation that followed the 1973 oil shock, and yet again following the onset of the economic crisis that engulfed the West in 2007. Yet some of its analytical and statistical methods have been useful in helping build models for long-term forecasts. These types of forecasts are used all over the world and are based on a variation of assumptions about the extent and nature of the workforce (demographics, education levels, etc.) and of the rate of capital accumulation in a country.

These rather easy-to-build static models, however, have their limitations. Possible shocks – such as the recent financial crisis – are not accounted for, leading to a recent flurry of new theorising around what Nassim Nicholas Taleb (2007) has termed 'Black Swan' events. Building on the neoclassic economic growth model initially developed by Robert Solow, these new economic models generally take technological development in a country as a 'given'. But it is the ability of a country to take up technology and to create new technologies that has proven to be one of the most important drivers of economic development and economic competition among countries in recent decades. This was understood quickly by the so-called 'developmental states' of East Asia, when the weaknesses of traditional development planning in developing economies had begun to be revealed. Governments in Japan, during the 1970s, and South Korea, during the 1990s, made it a strategic priority to climb the technology ladder. As part of their efforts, they imported the *Delphi method* from the US for their programming of publicly supported Research and Development (R&D) activities. This has served them rather well.

The centrality of science and technology (S&T) foresight today

Since the 1990s, science and technology (S&T) has been the principal area of foresight in which governments have invested around the world. It is the most common area of focus for foresight activities in Europe. It is also at the heart of EU foresight activities (see Box 2). It includes, for instance, the work of the Directorate-General for Research & Innovation (DG RTD), the EU parliamentary Science and Technology Options Assessment (STOA), which is a member of the European Parliamentary Technology Assessment (EPTA) network, and the establishment of the Institute for Prospective Technological Studies in Seville through the Foresight for the European Research Area (FORERA) team. Multiple individual member states have a strong S&T focus, including Germany, which in the early 1990s drew from the Japanese foresight experience to design its S&T policies in a move to better calibrate its research and innovation policies. A similar approach was taken by Sweden during its period of economic reforms in the 1990s. S&T foresight is also being copied in emerging markets across the world, though with generally limited success so far.

S&T foresight has evolved in recent years. This is seen clearly in the UK's foresight programme, which has shifted from narrow S&T foresight to the pursuit of activities which incorporate an understanding of the social context in which the S&T changes will take place. The goal is to help clarify how the social and economic setting will impact on the use and relevance of the predicted changes in S&T. Instead of focusing solely on advancements in agricultural biotechnology, for example, they are more likely to study food security and how it will be impacted by changes in technology. The goal is to create an evidence base to lead strategic planning. This inclusion of social contextualisation has been studied recently by long-established Japanese and Korean technology foresight programmes which are seeking to better integrate their work into wider planning efforts.

Other countries are developing new S&T foresight efforts with the goal of applying S&T to 'grand challenges'. South Africa, for example, has an increasing interest in using S&T foresight to deal with 'grand challenges' such as climate change. In Norway, the Norwegian Board of Technology addresses technological challenges and the possibilities opened up by new technology in all areas of society. In Australia, evidence-based technology foresight is being applied in sectors such as energy, sport and tourism by the new futures unit in the Commonwealth Scientific and Industrial Research Organisation (CSIRO).

Behemoth: managing welfare states and scarce resources

The dominance of established systems of government-led, military-focused foresight was contested in the 1960s and 1970s by 'futurologists' from outside the US security nexus. One of these critics was the man who coined the term 'futurology' in the 1940s, Ukrainian-born Ossip Flechtheim, while at Columbia University. To Flechtheim and the community of futurologists of that era, futurology was not a science of prediction and a tool for rational policy, as conceived by the established programmes, but a means to reflect on the present based on utopian ideals. What united sociologist Daniel Bell (author of *Toward the Year 2000: Work in Progress* in 1968 and *The Coming of the Post-Industrial Society* in 1973) in the US, Bertrand de Jouvenel in France, peace researcher Johan Galtung (co-author of *Mankind* 2000) in Sweden and sociologist Eleonora Masini in Italy was the betterment of the condition of mankind. Development issues, and social, political and environmental challenges, were prioritised in their work.

Their themes were progressively integrated into government foresight activities as the responsibility of governments for social matters – unemployment insurance, the expansion of public health systems, the development of extensive pensions systems – has grown significantly. Government departments across advanced economies now commonly implement or commission foresight activities in their key areas of interest. Since the 1990s, the rising scarcity of funding for expanding welfare states in the developed world has been a major driver of foresight work, which is seen as contributing to the development of targeted and cost-effective policies.

Natural resources, energy and ecology

With the 1973 oil shock and the ensuing decade of economic stagnation, a gloomier outlook was taken by both established and independent foresight experts. The security of energy supplies and the recurring theme of natural resource scarcity became a common feature of long-term foresight and forecasting. In the energy field, Western consumer economies established the International Energy Agency whose role, among others, is to issue forecasts and scenarios about global energy markets. National administrations also undertake their own work in that field. More recently, governments have focused on themes related to water and food, and the potential for conflicts arising from scarcity challenges.

The decade of stagnation and high oil prices also led to the emergence of an environmental 'futurologist' movement, starting with the Club of Rome and its 1972

Limits to Growth report. Environmental degradation and resource depletion have since become a recurrent theme in foresight activities, both by government and by interest groups contesting established policies. Climate forecasting, for example, has become strongly institutionalised with the establishment of the Intergovernmental Panel on Climate Change (IPCC) in 1988 to do this work and inform policy-making in member states.

The case of Sweden, as a highly developed Nordic welfare state, is emblematic of this 'new age' type of government-sponsored foresight. By creating a Secretariat for Futures Studies in 1973, its government was one of the first movers in Europe on that front. The secretariat's initial missions focused strongly on work in industrial society and on natural resources. In recent years, the secretariat, now called the Institute for Future Studies, focuses on institutional issues related to the 'welfare society'. More recently, Sweden established a Commission on the Future, reporting to the Prime Minister's office, which published a study on long-term issues related to sustainable growth, demographic trends, labour market integration, democracy, equality and social cohesion.

Back to Leviathan in a rapidly changing world?

Since the late 1990s, there has been growing interest in government foresight in many countries, particularly in relation to security issues. This interest in security-related foresight may be seen as related to changing perceptions about potential threats to which governments must respond. The rapid rise of China, for example, is focusing minds on the geopolitical power balance again and leading to a small revival of military-centred long-term strategic studies. The concurrent rise in perceived threats from terrorists and failed states is also leading to foresight work on security issues beyond the military. Richard Betts (1997) distinguished three dimensions of 'strategic studies': *military science,* which deals with technical issues and tactics; *strategic studies*, which deal with the interaction of 'political ends and military means [under] social, economic, and other constraints'; and *security studies*, which are 'potentially boundless' and concern 'everything that bears on the safety of a polity'. Today, practically every dimension of human life can thus be considered to affect the security of a state.

In this context of broad security worries, the recent surge in foresight activities has also seen the emergence of a new form of 'grand strategy' foresight activity: global, all-encompassing scenario building. Its most well-known incarnation is the *Global Trends* reports published regularly since 1997 by the US National Intelligence Coun-

cil (NIC). These reports, parts of which are accompanied by substantial outreach to the public, are aimed at helping US political leaders shape their policy orientations. The emergence of such 'grand strategy' reports since the late 1990s are intended to highlight the strategic challenges posed to established powers by a world where rapid change is induced by a globalising economy, the rise of new political powers and actors on the world stage, and financial and political turbulence. Reports of this type have been created by the British, French and Canadian militaries as well as by IMEMO in Moscow. The governments engaging in these efforts are mostly military 'great' powers (or former ones), for whom the interconnections between different spheres of human life matter for long-term strategy and military planning.

Broadly defined security worries also interest states beyond the traditional big players, such as Singapore. Newly prosperous, but very small, Singapore is an island state squeezed between rising powers in its region. Situated at a crucial crossing of key maritime trading routes and exposed to both conventional and less conventional threats to its security, Singapore rapidly developed foresight capacities in the 1990s. Similarly, Finland, the country that acted as sort of a buffer between the Soviet Union and Europe, and which underwent a major economic crisis in the early 1990s at the end of the Cold War, has also put foresight at the heart of government.

Which governments do what - and how

Different variables shape the organisation of foresight in government. The most important ones are discussed below. Table 1 provides a brief bird's-eye view of the approaches taken by a selection of leading foresight countries from among those surveyed.

Haves and have-nots

Rich vs. poor

The availability of resources is a key variable for the pursuit of foresight activity. Our analysis shows that it is mostly developed countries who engage in foresight. Countries with large and well-resourced governments can pursue foresight activities which constitute only a small portion of total spending. They can experiment with non-essential programmes for which the value of the outputs may not be easily measurable. Poorer countries faced with immediate pressing problems related to poverty and basic security are less likely to devote precious resources to worrying about the problems of the distant future. Absolute wealth is not the only indicator

of interest in, and support for, government foresight, however. Norway, for example, is among the richest countries in the world on a *per capita* basis, but has not invested as much into government foresight work as other small countries like Finland and Singapore. At the sub-national level, regions and governments with more resources are also more likely to engage in foresight, as seen in Germany where the wealthiest *Länder*, such as Bavaria, Baden-Württemberg and Rhineland-Pfalz, are more likely to pursue foresight activities on their own.

Provision of resources, however, has not been consistent, even in those countries that have most enthusiastically joined the move toward increased use of foresight in the last decade. Foresight programmes have rarely been seen as essential work and funding has often been cut in times of austerity. Ensuring the survival of foresight programmes thus requires that the perceived value of investments into foresight be made clear to the decision-makers who fund the programmes and use the outputs. How much value a particular foresight project has will depend significantly on how the programmes and projects are designed and implemented.

Military vs. civilian

A related variable in the design and use of foresight programmes is the size of the particular organisation within government. Militaries, which often make up a large portion of government budgets, are more likely to have established and well-resourced foresight programmes. This is especially noticeable in the US, but is a trend that was identified for almost all countries in this study. This is partly due to the total amount of departmental resources available, but also due to the goals of the department and the nature of the spending. Militaries are more likely to be tasked with specific goals related to the protection of national sovereignty, for which the analysis of multiple future scenarios and potential future risks can provide important value for shaping strategic planning. Most of the 'grand strategy' foresight efforts looking widely at global trends, discussed above, were completed by militaries (UK, France, Canada). Militaries are also more likely to have large, long-term purchasing programmes (expensive military equipment) for which an understanding of likely future security environments is essential. Departments of agriculture, human resources or environment, for example, have historically had fewer resources. There are also potentially less severe consequences in the event of planning errors.

International cooperation and the complementary work of international organisations

Countries seeking to conserve resources can work on joint foresight activities or make use of foresight work by international organisations. The US and Singapore are notable for their involvement in issue-specific cooperative foresight meetings and projects. Other countries form joint foresight programmes, often focused on issues related to their region or to issues of international cooperation. Two examples are noteworthy: the cooperation between Australia and New Zealand through the Australasian Joint Agencies Scanning Network (AJASN) and the Australia New Zealand Horizon Scanning Network (ANZHSN) and the regional cooperation between Nordic countries (Denmark, Norway, Sweden, Finland and Iceland) through Nordic Foresight projects.

Intergovernmental organisations like the OECD and NATO have the best established foresight programmes among international organisations. The OECD is explicitly tasked with providing policy support to member governments, and has developed 'OECD Futures' as part of this role. For NATO, which works on intergovernmental cooperation among militaries, foresight activities are well established and include a Long Term Requirements Study, focused on technology and capabilities requirements, and a Multiple Futures Project similar to the 'grand strategy' efforts undertaken by member state militaries. Smaller contributors to NATO have been able to benefit from this shared intergovernmental capacity for foresight, and to limit their own investments in foresight work. As well as providing value to member states, international organisations use foresight activities to establish their own priorities. International organisations like development banks (the Asiaan and African Development Banks, the World Bank) or UN organisations (e.g. UNESCO) have done foresight projects in support of their own specific mandates, though these have generally been quite limited.

Box 2 – What about the EU?

The EU's foresight work has grown significantly in the past 20 years. Most of this work is driven by the European Commission, through the Directorate-General for Research & Innovation (DG RTD), the Joint Research Centre (JRC) and the Seville-based Institute for Prospective Technological Studies (IPTS), generally under the Framework Programmes for Research running over 7 years. In the European Parliament, the Science and Technology Options Assessment (STOA), created in 1987, is a panel of MEPs responsible for carrying out external expert assessments of the impact of technologies for the use of Parliamentary committees. It is a member of the European Parliamentary Technology Assessment (EPTA), which is a network of technology assessment institutions specialising in advising parliamentary bodies in Europe. One core activity is the creation and management of networks of experts and institutions, in order to facilitate the sharing of information on foresight. Several of these activities also developed important foresight reports with input from external experts. These initiatives, networks and projects include:

- The European Foresight Platform (EFP) (2009-2012) (previously the European Foresight Monitoring Network (EFMN) (2004-2008)). It aims at building a global network to share knowledge about foresight, forecasting and other future studies methods in Europe and internationally. The EFMN database contains 1,916 foresight initiatives, 160 briefs and 124 other documents. The EFMN published 'Mapping Foresight – Revealing how Europe and other world regions navigate into the future', on foresight practices in Europe and other regions.

- Foresight in the European Research Area (FORERA): website for S&T foresight.

- FOR-LEARN (2005-2008): a tool to support mutual learning between foresight professionals, stakeholders and policy-making organisations in Europe.

- ERA-Net (since 2007): a network that aims to strengthen coordination in research, including foresight, within the EU.

- iKnow (2008-2011): a network of close to 2,000 members in 91 countries, 'interconnecting Knowledge' (iKnow) identifies issues, events and developments shaping the future of science, technology and innovation (STI) in Europe and other world regions.

- SANDERA (2009-2011): a project that examines the future impact of security and defence policies on the European Research Area.

- ESPAS (on-going): a quadrilateral inter-institutional project identifying global trends likely to shape the world towards 2030 and their implications for the EU.

- Other such projects include or have included in recent years: EU-GRASP, Global Europe 2050 and The EU in the World of 2030 (AUGUR), the evaluation of EU policies (DEMETER) and global changes impact (GLOBAL-IQ), the future of the Mediterranean area (MEDPRO), Science, Technology and Innovation (FARHORIZON, INFU, SESTI, CIVISTI), Visions on the European Research Area (VERA), work on post-carbon society (PACT, GILDED, PASHMINA), Social Platforms (SPREAD) and Forward-Looking Analysis of Grand Societal Challenges and Innovative Policies (FLAGSHIP).

Beyond formal foresight programmes, different EU Commission directorates also use foresight. The Directorate General for Energy, for example, has estimated future import dependency rates for hydrocarbons for the period leading up to 2030. Its recent *Energy Roadmap 2050* recommends a European policy strategy based on several scenarios on what the world of energy could be like in the coming decades.

Sources include: Tuomo Kuosa, *Practising Strategic Foresight in Government*, 2011; Graham H. May, 'Foresight and futures in Europe: an overview', *Foresight*, vol. 11, no. 5, 2009; EU Commission website

Key government approaches to organising foresight

Analysis vs. prescription

Our study suggests that wealthy countries in North America, Europe and Asia are more likely to pursue foresight with the aim of understanding the uncertain future, keeping the foresight analysis initially disconnected from any potential policy implications. The completed output of the foresight processes can then be used to

inform policy planning. This separation between the foresight phase and the policy application phase is not always distinct, as many programmes involve their target audience of policy planners and decision-makers within the foresight work to ensure that the programme outputs are relevant to this audience. The goal of not pre-supposing the results of the foresight efforts, however, is seen as central to the value of these programmes.

This model which separates foresight and policy responses is less common in developing countries and emerging economies (India, Indonesia, China, Brazil, South Africa), which are more likely to focus on producing centralised planning documents in which a prescribed vision for the future is created in accordance with government goals.

This difference highlights another variable in understanding foresight activity: interest in central planning. The Chinese government, for example, has produced 5-year plans since the early 1950s and initiated the 12th 5-year plan (now renamed 'Guideline') in 2011. These plans were largely economic and industrial wishlists put together by the Central Committee of the Communist Party of China (CPC) for the coming 5 years with limited forecast or foresight work to inform them. India, Indonesia and South Africa have engaged in similar planning exercises. As the economies of China and India have become increasingly liberalised in recent years, the importance of their 5-year planning has been reduced. Though this study found no government foresight work in China or India that was not explicitly tied into strategic planning documents, both governments have expressed interest in moving towards understanding long-term indicators that have not been pre-supposed to ensure they fit with central planning goals.

Another noted difference between the wealthy countries focused on analytical foresight and the countries that produce central planning 'vision' documents relates to their expectations for the future. Recent discussion with foresight experts highlighted that the perceived value of foresight for many Western states is to help react to the current economic crisis and to the recent geopolitical rise of non-Western powers. There is a sense of trepidation regarding uncertain waters that must be navigated. The discussion is reactive and focused on declining resources, rising challenges and resilience to external changes. Reports from developing countries which pursue planning programmes, on the other hand, speak more positively about the future. Regardless of the apparently limited accuracy of the wishlist-like planning documents, there is a feeling that the future is theirs to shape. The idea that foresight is for the fearful and planning is for the positive, however, is not an absolute

one. Modern foresight methods were developed in the US during the dynamic boom years following World War II and have continued through to today, through different periods of optimism and stagnation.

Centralised vs. decentralised

The degree of centralisation in government foresight programmes varies significantly among countries. Countries which have made concerted efforts to prioritise foresight efforts within their governments (the UK, Singapore, France, the Netherlands) often have central foresight agencies taking the lead on government efforts and responding to requests from central policy bodies. The best-established programmes feed directly to ministers or deputy ministers at high levels. The UK Foresight Office (UKFO), for example, is directed by the Chief Science Officer and reports directly to cabinet, while the French government has established a centralised Centre d'Analyse stratégique (CAS) working directly for the prime minister. Canada has established Policy Horizons Canada (PHC) which reports to a central committee of deputy ministers from across government, while Singapore has established a Risk Assessment and Horizon Scanning (RAHS) programme as part of the National Security Coordination Secretariat (NSCS) directly within the Prime Minister's Office. These centralised offices do not have a monopoly on all foresight policy in government and governments with central foresight offices often also have strong foresight programmes in other departments. The centralised offices, however, often play a key role both in supporting top decision-makers and in training and capacity building for foresight in other departments across government.

Another group of countries have decentralised models (Finland, Germany, US, Italy, Switzerland) in which government departments, if they choose to do foresight work, generally act independently. For example, multiple departments of the US government, including Homeland Security, the Federal Emergency Management Agency (FEMA), the National Intelligence Council (NIC) and the General Accountability Office (GAO) have dedicated foresight capacity for serving their different bureaucratic and political leaders. Individual US departments may also have multiple foresight activities. The US Air Force, for example, has at least three major centres of foresight activity, located in the Air Staff, Air University and the Air Force Research Institute, which are separate from the foresight work of the other branches of the military (army, navy) as well as from the central bureaucracy in the Department of Defense. In Germany, the Federal Ministry of Education and Research (BMBF) is the main federal government agency doing foresight (including the Futur programme) coexisting with approaches at the sub-national level, conducted by *Länder*.

External experts vs. in-house capacities

There are also differences in how countries make use of external consultants and agencies to do foresight work. In some countries with central planning agencies (India, Mexico, South Africa), foresight work by external agencies have been used to help inform government planning processes. The Indian defence department, for example, has contracted directly with external think tanks to do foresight reports on the Asian security environment. The EU also uses external consultants to implement much of their foresight work.

Other countries, including Norway, Japan, Korea and Russia, use arms-length research agencies with government connections rather than external consultants. Public policy foresight in Norway has historically been led by the Research Council of Norway, which operates with close ties to multiple government departments. Both Korea and Japan have special institutes for science and technology work.

China's complex planning environment involves extensive connections with semi-autonomous think tanks (none are truly independent) as well as internal departments to do horizon scanning and technology foresight. The Chinese Academy of Sciences (CAS), reporting to the State Council, and the National Research Center for Science and Technology for Development in the Ministry of Science and Technology have each performed 10 to 15 year technology foresight surveys. The China Institute of Contemporary International Relations (CICIR), also of the State Council, completes strategic, political, economic and security studies, while the Chinese Academy of Social Sciences (CASS) has a Centre for Technology Innovation and Strategy Studies which has done futures work.

Countries such as Canada, Singapore, Switzerland, France and the UK, generally perform their foresight work internally, though with input into the process from outside experts. While using external consultants may provide more flexibility for budget-conscious governments, outsourcing prevents the build-up of foresight skills within government and does not allow for repeated, iterative processes that build continually on feedback from past foresight work.

Table 1

Foresight activities in surveyed countries - key features

Country	Foresight is well-resourced and widely used	In-house or arms-length implementation	Central government foresight agency	Foresight in multiple departments	Established regularity of programmes/ reports	Predominantly 'vision' planners
Australia		•		•		
Brazil		•				•
Canada	•	•	•	•	•	
China		•			•	•
Finland	•	•	•	•	•	
France	•	•	•	•	•	
Germany	•	•		•	•	
India					•	•
Indonesia						•
Italy				•		
Japan	•	•		•	•	
Mexico						•
Netherlands	•	•	•	•	•	
Norway		•				
Russia						•
Singapore	•	•	•	•	•	
South Africa				•		•
South Korea	•	•			•	
Sweden	•	•	•	•	•	
Switzerland		•			•	
UK	•	•	•	•	•	
US	•	•		•	•	

Conclusions: foresight and policy-making

Foresight is a useful tool to help look beyond pressing short-term issues and build policies for the long term. Integrating foresight into the policy process is not simple. But some criteria for success can be identified, which can ensure the viability and resilience of foresight programmes over the long run.

Overcoming entrenched short-termism

One of the core aims of foresight is to respond to the perceived fact that political leadership is too focused on short-term thinking and too responsive to the election cycle, weakening its ability to take decisions that matter for all in the medium to long run. Some argue that the institutional design of foresight activities is also too closely attached to the election cycle. In that regard, the 'managed democracy' of Singapore was cited as a country that can invest in foresight activities because its leaders are less beholden to an electoral calendar. This issue was highlighted by stymied efforts to develop an 'Anticipatory Governance' system in the US, which outlines a plan for building a centralised foresight capacity responsive to the executive branch of the federal government (Fuerth, 2012).

However, our review of foresight programmes around the world suggests that established electoral democracies are actually more likely to implement foresight programmes. The electoral calendar may be a relevant factor in the choice of government foresight and planning decisions, but not a decisive one. Foresight programmes tend to be designed precisely as a tool to overcome short-termism, while also engaging stakeholders and the public as part of a broader democratic process. In Finland, the parliament itself has a strong in-house foresight capacity independent of party-political interests.

Bringing together different epistemic communities

Practising foresight often involves bringing together different epistemic communities and connecting foresight to policy-making.

More than one foresight expert interviewed for this study suggested that there may be a cultural disconnection between established policy communities and foresight experts. Foresight experts interviewed expressed concern about a perceived lack of interest in, and support for, foresight activity. The work of foresight experts is often perceived by policy professionals as speculative and not relevant to their work.

The right institutional design for bringing together policy and futures expertise is also under debate. Is it useful to maintain a 'separateness' of the foresight experts from the policy community? And if so, how can their work best be articulated? One military foresight expert interviewed indicated that part of the success of his programme was related to the fact that it was not located in the main defence headquarters, but in a separate city where it was less distracted by the daily flow of other issues. This may indeed be helpful for foresight work, but the outputs from its programmes still need to be considered of value by the leaders back in the central organisation.

Sharing foresight expertise across departments in government is also quite a challenge. The case of military foresight programmes in some countries is illustrative in this regard. While there is some cooperation between military and civilian foresight projects, military foresight programmes in countries such as the UK, Canada, the US and Norway remain quite separate from work in other government departments. Cooperation is also often limited among different sections of the military in these countries. While military foresight efforts very often seek input from a wide range of participants, the high level of specificity in the mandates of many military foresight efforts seems to allow them to provide useful outputs for their local target audience, often a sub-departmental policy unit, but may inhibit cooperation on organisational/institutional issues. The often high turnover of uniformed military personnel being moved from posting to posting can also limit the accumulation of both foresight expertise and network contacts.

Making the relationship work between the decision-makers at the top, the established policy planners, and the foresight thinkers is another often-mentioned problem. Those foresight analysts most dismayed at the lack of foresight appreciation in their own governments decry the lack of senior leadership in getting established policy planners to accept the foresight community.

Linking foresight with policy-making

This survey has noted an increased professionalisation of foresight work, which has shifted back from being an activity pursued by a few 'outsider' futurologists to being applied in established policy planning departments across government. This professionalisation includes both standardisation of foresight methods and better application of foresight to specific, but not overly narrow, policy problems. It also includes slow movement towards more effective communication with policy audiences. It is a challenge to translate complex and sometimes nebulous future issues

into coherent documents that can usefully inform the policy process. A brief review of foresight reports and websites suggests that more work is required in this area. On the other hand, foresight experts argue that policy planners tasked with assisting decision-makers are more likely to feel comfortable providing decision-makers with overly simplistic 3-options models for policy decisions: a low, a high, and a middle (or moderate) option, for which the middle option is always preferred and recommended.

An important factor in the resilience of foresight programmes has been whether the target audience for the foresight work has had input into the design of the activities and the choice of projects. Programmes that look broadly towards the future, while leaving the onus on the audience to determine how to find value in the programme output, have struggled to win consistent support from funders and decision-makers. Few countries, for example, engage in open-ended global scenario foresight exercises. The leading government programme of this type, the NIC *Global Trends* project, has developed a global audience interested in seeing a view of the future from an American intelligence agency. Most other open-ended foresight activities looking broadly at global trends have generally been undertaken by leading Western militaries, with the goal of feeding into domestic military planning.

For each of these 'global trends' exercises, there is a balance to be struck among comprehensiveness (is everything happening in the world important?), coherence (how can we make sense of all this?) and relevance for policy. The best resourced and most well-established foresight programmes (the US, Singapore, the UK) generally have a clear focus on issues of importance for their pre-identified audience within the government. Not all successful foresight projects produce specific policy recommendations as part of their output. However their success is explained by the fact that they are generally run with input from members of their target audience. The latter will subsequently be in a better position to design the policy recommendations that flow from the foresight output.

Box 3 – Foresight programmes: main criteria for success

The results of our survey show that well-designed and successful foresight programmes are likely to meet most of the following criteria:

- Identify the target audience with precision. They should not be a 'type' of people or the 'policy community' but a specific, definable list of organisations and individuals.
- Include input from this target audience in setting the agenda and at different stages in the foresight process. Ensure that the output is targeted at them.
- Communicate clearly and directly in language accessible to the target audience.
- Maintain close ties with the senior decision-makers and policy-makers.
- Establish clear links between foresight topics and today's policy agenda.
- Cooperate with the other agencies, domestically and internationally.
- Develop consistent, long-term sources of funding.
- Work iteratively. Foresight work often involves a wide group of participants, and converting their inputs into useful outputs is difficult without feedback loops.
- Establish programmes rather than one-off projects. There is a learning curve to doing foresight work. Programmes allow for learning processes and personnel continuity.
- Create scenarios. Use them. Create new scenarios based on feedback and verification.

Annex

Country	Organisation of government foresight: Examples from ten selected countries
Australia	Australia has recently begun to use government foresight systematically. The Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia's national science agency, has a dedicated team (CSIRO Futures) working on foresight in energy, transport and other fields. It produces 'Our Future World' updates every 2 years on global megatrends. Multiple other departments do some foresight work. Every 5 years, the Treasury department produces a report on long-term issues (40 year forecast) to help short-run decision-making. The establishment of the Strategic Policy Network with representatives from every department, led by the Department of the Prime Minister and Cabinet, may impact foresight use for strategic policy.
Canada	Multiple government departments have used foresight, and this has increased in the last few years with the creation of Policy Horizons Canada (PHC), a centralised agency for doing foresight work and building foresight capacity in government. PHC is directed by a high-level steering committee of deputy ministers and reports to the Privy Council. Parts of the Department of National Defence, including the Directorate of Future Security Analysis, use foresight for capabilities and personnel planning, primarily for internal audiences. Multiple other departments pursue some foresight work on economic, social and technological issues within their policy departments.
Finland	Foresight is well-integrated into Finnish policy planning. The Government Foresight Report, prepared through wide consultation by the Prime Minister's office, is prepared at the start of the mandate for a new incoming government. During the mandate, the Government Foresight Network develops a report on the Finnish Policy-Making environment and each ministry has dedicated staff to develop Ministries Futures Reviews. The Finnish Parliament's also has a 'Committee for the Future' to pursue and review foresight work.
France	France has the longest-established foresight programmes in Europe, with policy-focused foresight services in almost every department. The Centre d'Analyse stratégique (CAS) works directly under the Prime Minister to advise on policy formulation and implementation. The Senate has a delegation dedicated to foresight to reflect on socioeconomic transformations through scenario-building. The French defence department has a Délégation aux Affaires stratégiques (DAS) which carries out regular analyses of long-term international geostrategic issues.

Country	Organisation of government foresight: Examples from ten selected countries
Germany	Over the last 20 years, Germany has developed a decentralised mix of foresight projects in departments at federal and *Länder* levels. The Federal Ministry of Education and Research (BMBF) is the main government agency involved in foresight, including through its 'Futur' project on research planning. At both the national and regional levels, particularly in Bavaria and Baden-Württemberg, foresight projects (both internal to government and by external agencies) study a wide range of technological, industrial and social science issues.
Korea	Korea stands out for its active science and technology foresight activities, executed by the Korean Institute for Science and Technology Evaluation and Planning (KISTEP), and very focused on developing S&T capabilities. The defence department also pursues foresight through the Korean National Defence University. There has been recent discussion of the need to address the social context in which the S&T changes will take place.
Russia	Russia's past as a centrally-run superpower has endowed it with forecasting experience, but vision-focused planning efforts to define rather than understand the future remain the norm. Recent focus on technology foresight reflects an attempt to build a government-driven innovation strategy inspired by East Asia. The Institute for World Economy and International Relations (IMEMO), an arms-length think tank, does influential economic and geostrategic foresight studies. The Kremlin-sponsored Council on Foreign and Defence Policy (SVOP) is a group of experts contributing to developing long-term visions (rather than foresight) on military and strategic issues.
Singapore	Singapore's foresight system is very well developed with distributed capabilities across the entire span of the public service and is a global centre for learning and planning about government foresight. There is a concerted effort to develop 'strategic anticipation' capacity across government and to actively use foresight outputs for policy planning. Every 5 years, the government formulates national scenarios for the next 20 years. The central element of foresight is the Risk Assessment and Horizon Scanning (RAHS) programme (including a think tank, solutions centre and experimentation centre), part of the National Security Coordination Secretariat within the Prime Minister's Office. The Centre for Strategic Futures also plays a key role.

Country	Organisation of government foresight: Examples from ten selected countries
UK	Government foresight in the UK is dominated by the UK Foresight Office, a central agency of government that reports directly to cabinet, and is headed by the Chief Scientific Advisor. It was originally dedicated to technology and industry but now has a broader thematic mandate to look at challenges for the future, pursuing major foresight projects, horizon scanning, and training activities across government. Separately, the Development, Concepts and Doctrine Centre (DCDC) and the UK Defence Science and Technology Laboratory (DSTL) do foresight and horizon scanning for the Ministry of Defence.
US	Well-established, but decentralised foresight programmes are scattered throughout the US government. Many agencies (State, FEMA, Defence, Treasury, Energy, OMB and especially GAO) have strategic planning capacities that use foresight to varying degrees. The National Intelligence Council produces major Global Trends reports every 4 years. As the world's foremost producer and user of foresight work in the last half century, the US military has an array of strategic planning and intelligence organisations, in which foresight work is well entrenched to inform planning.

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