Strategic Foresight Primer

Angela Wilkinson

European **Political Strategy** Centre

Foreword

by **Ricardo Borges de Castro**
Adviser on Strategic Foresight to the European Political Strategy Centre

The idea for this Strategic Foresight Primer was born out of necessity. The European Political Strategy Centre has a mandate to engage in anticipatory governance and identify potential future challenges and opportunities for the European Union. Yet, we soon realised that there was no readily accessible and 'easy-to-use' guide on strategic foresight — a 'foresight for dummies' — explaining the nuts and bolts of the process. What is strategic foresight and what is it not? When and how to use it? What are the advantages and limitations of the different methodologies?

Angela Wilkinson was most definitely the right person to help answer these questions. Angela has an international career spanning more than 30 years in strategy, forward assessment and public policy. Her work in the private, public and non-for-profit sectors has helped policy- and decision-makers, business leaders, civil society organisations, and individuals to be more prepared for the future and to shape better decisions.

This Primer is a substitute neither to the existing (and emerging) literature in the field of strategic foresight nor to the relevant work being done by so many practitioners around the globe. Also, it does not replace the foresight interventions and the conversations that Angela so eloquently explains in the next pages.

This brief guide can be used as a first port of call for those navigating today's 'TUNA' conditions – Turbulence, unpredictable Uncertainty, Novelty and Ambiguity. It is also a contribution to make strategic foresight more accessible to a larger community of policy-makers and to make anticipation a new literacy so that everyone – from public institutions to citizens – can be better prepared for the future.

As the European Union finds fresh wind to sail after almost a decade of 'polycrisis', this Primer can help us to continue fulfilling the 'shared vision' and the 'common goals' of the European project with an eye on the horizon.

We are living in an era of faster and fundamental changes, with uneven impacts on geographies and generations. The pace of social change and technology innovation is accelerating and outpacing governance systems: capitalism 5.0, a fourth Industrial revolution – and diplomacy 2.0 and Bretton Woods 1.0!

How can institutional innovation keep pace with technological advances and enable whole societies to flourish in an era of inevitable surprise and increasing social complexity?

Rather than relying on experts to forecast the numbers and predict what will happen next, the interaction of inertia and innovation creates the perfect cocktail for using an approach called strategic foresight.

DIDN'T ANYONE SEE IT COMING?[1]

Ten years ago, the world had yet to experience the 2008 Great Financial Crisis. Yet, even before disaster struck, an increasing number of people were aware of the unprecedented rate of default of mortgage repayments in parts of the USA. Similarly, in the following years, anyone who would have predicted that there would be a migration crisis in Europe, or the possibility of a return to nuclear war, would have been ignored. The implications of these potential crises were so uncomfortable and unfamiliar that they were overlooked until it was too late.

These situations also show that, while data-rich, model-based forecasting, is the foundation of evidence-based policy, it cannot be relied on for decision-making in situations characterised by **'TUNA' conditions** – *Turbulence, unpredictable Uncertainty, Novelty and Ambiguity*[2].

Yet societies across the world are facing a growing list of globally connected 'TUNA' challenges. Many are optimistic about the prospect of a so-called 'fourth industrial revolution' – and hope for a new era of digital and other abundances. Others are also anxious about cyber security and the potential misuse of the new power of humans to re-engineer the building blocks of life. Our world is increasingly global

and ultra-local. Climate change is the poster child of the Anthropocene: The cumulative activity of all humans over centuries is now having a detectable and faster impact than geological processes on the Earth's natural life support systems (air, weather, oceans, water, land, biodiversity). There is an increase in social complexity which reflects an unevenness of experiences across geographies and generations of globalisation. The rise of social media has enabled individuals to tailor feedback about fast shifting realities (personalised 'news') to fit their beliefs and preferences.

Human beings have always grappled with the fundamental tension between our inability to know and control, and our capacity to anticipate, imagine and create the future. This tension is key to the evolutionary success of our entire species and to better policies!

A shift in stance – from knowing to learning

We can either slow down the pace of change or speed up our ability to learn our way into the future together, by using more than one, but not too many, plausible alternative stories of the future. We can use strategic foresight to exercise good judgement about the future and to start an empathy revolution.

"We can either slow down the pace of change or speed up our ability to learn our way into the future"

THE BASICS

The future is always a story – and there is always more than one story

An important place to start in developing and using strategic foresight to learn our way into the future is to accept the assumptions that: (1) a story and new stories of the future are always emerging, and not only for children; and, (2) there are no facts about the future.

"there are no facts about the future" Facts, by definition, are 'of the past'. The future has not yet happened and cannot be empirically observed or measured. But it can be experienced through imaginative storytelling, immersive learning and using collaborative approaches to group model building and whole systems thinking.

What is strategic foresight?

Strategic foresight offers a way of making use of our inherent storytelling abilities in order to engage tactic knowledge, make assumptions explicit, forge new shared understanding (i.e. meaning making), and anticipate and prepare for what has yet to happen.

In a strategic foresight process, a manageable and memorable number of plausible stories of the future are developed and contrasted. There is always more than one. But four or more stories can be overwhelming. The rule of thumb is to build the least number needed for

the purpose in hand. It is also important to avoid the psychological trap of telling all good vs. all bad stories about the future – no one learns anything in Heaven and nobody wants to visit Hell! Furthermore, rather than telling stories of the future as victims or winners, it is more effective to add a third perspective and tell the story from the stance of the learner.

Deeper and shared insights are developed by iterating between different ways of knowing the future – drawing on creative, critical and analytical thinking and developing narratives (a story map of events linked in time) and a state description – i.e. a time-independent, system map, or causal loop diagram, that enables the discovery of feedback loops. The clarity of the 'whole system' logic enables framing and reframing assumptions to be made explicit, testable and contestable. Reframing, in turn, opens up a space for new ideas – enabling new solution spaces to be discovered, and more and different policy options to be designed, tested and considered (re-perception of agency). Futures learning is enabled by completing several cycles of the reframing-re-perception loop.

Prospective leadership judgement pivots on the quality of the strategic conversation which opens up a safe space for disagreement, and provides a platform for immersive learning and learning by doing. The aim is to reveal and respect different perspectives and forge the new common ground required to catalyse and sustain new collaborations.

Box 1: Discussion vs conversation

Discussion – to examine, to investigate, to dash to pieces, to agitate

When people discuss a report they do not talk with each other but at one another trying to reach consensus on who is right and what is wrong.

Conversation – to turn, to bend, the act of living 'with'

When people are engaged in a strategic conversation they actively listen to each other, build on each other's ideas and develop a new meaning and shared understanding.

An infographic is not a substitute for a good quality conversation. The discussion about a report does not have the same impact on our perception and learning as a conversation in which we talk with each another and turn ideas over together to create shared understanding and new common ground.

"Prospective leadership judgement pivots on the quality of the strategic conversation "

By developing, analysing, contrasting and using plausible, alternative stories of the future through a process of strategic conversation, it is possible to reveal, test and challenge deeply held assumptions about the future. Strategic foresight enables leaders to ask better questions about the future, make strategic choices explicit and support the discovery, design and consideration of more and better options for action.

What strategic foresight is not?

Not a report – a carefully designed and purposeful intervention

Strategic foresight is a learning process that offers a decision-maker new and refreshing perspectives on the present situation – which is often puzzling, socially messy and uncertain. It engages with uncertainty as a friend rather than as a foe.

It is not a report but a means to some other end. The carefully designed and purposeful intervention focusses the social learning process on the needs of a specific set of users and their needs (i.e. their uses foresight).

There is no single, right or best method: each approach has its strengths and limitations. Good practice involves purposeful design, a careful choice of methods, iterating between different steps in the conventional policy process (or 'cycle') and developing a culture of use i.e. designing with the 'so what' in mind, rather than relying on disseminating a report.

There is a diversity of strategic foresight methodologies - including megatrends analysis, scenario planning, and normative approaches – design futures and visioning and back-casting. There is also diversity within each method – for example, the choice between expert-led Delphi surveys, open search or multi-lingual meta-scanning in horizon scanning, and, the many different methods for building plausibility-based, exploratory scenarios e.g. inductive, deductive, abductive, normative, incremental, alternative, critical and perspectives-based methods.[3]

What is the role of the strategic foresight practitioner? – A futures midwife

A strategic foresight practitioner is not an armchair optimist or pessimist, nor an expert forecaster.

"The role of the strategic foresight practitioner is akin to that of a futures midwife"

The role is akin to that of a futures midwife, helping anxious parents to breathe in and out whilst learning to cope with new and surprising future possibilities encountered in bringing forth new life – i.e. new ideas that would otherwise not be considered or given any room to grow. Other ways to think about the roles and skills involved include:

- **Storytelling coach** – using the power of stories as a motive for change.

- **Window cleaner** – helping people to think 'outside the box' and see beyond the usual policy timeframe in decision making.

- **Map maker** – enabling the bigger picture to be seen and forging shared understanding and new meaning.

- **Psychoanalyst** – as uncertainty creates anxiety in the expert, promoting positive thinking, cultivating empathy, reflecting deeply on the role of the self in perceiving reality, and making change happen.

- **Learning facilitator** –engaging user-learners as reflective practitioners.

The strategic foresight practitioner does not claim to know the future but aims to support and enable groups, leaders and their organisations to prepare, shape and create their future through the process of learning with futures.

What can strategic foresight offer?

Decision-making would be much easier if small things had small effects, if big changes had big effects, and if what worked in the past continued to work in the future. Yet our world is, and has always been, full of surprises. Our realistic hope for a better future is realised through the reality of team-based decision-making and the development of collaborative and anticipatory strategies.

Many people, including leaders, struggle to find the time for big picture never mind think more deeply about the future. Human brains are 'hard wired' to avoid or ignore information that we find threatening or makes us uncomfortable. We care about the present and cognitively discount the future. Foremost in our mind is a sense of future based on an extrapolation of what we experienced recently. The limits of human cognition are real and cognitive biases help us stay focussed and keep us sane and happy.

In policy settings, leadership incentives are often biased towards stepping up in a crisis, rather than acting early to prevent crises from happening. Those willing to stick their heads above the parapet, must also find the courage to confront unfamiliar and often uncomfortable realities and grapple with the complexity and uncertainty of the situation.

There is also intense competition for attention: dealing with pressing and urgent issues is rewarding and satisfying. It gives us a sense of clear purpose and can provide instant gratification. There is also a presentism bias and a culture of short-termism, few incentives, no thanks and limited appetite to think beyond the next week, election, decision point, etc. The default response mode in policymaking is reactive rather than proactive.

There is some good news: Modern societies are not looking for leaders who know what the future holds, but for leaders who can help them realise a better future for themselves, their families and communities.

The limited space for 'open' futures thinking in policy settings is not conducive to learning the way into the future

Even with gazillions more bytes of data, there is less clarity and more time needed for mindful interpretation. The most significant choices and decisions facing individuals and societies involve aspects of emotion and aesthetic judgement, which are not easily reduced to noughts, ones or any other numbers. Making tough decisions, more quickly and under unpredictable uncertainty, benefits from a good conversation.

The art of diplomacy is to push difficult problems

"Many people, including leaders, struggle to find the time for big picture never mind think more deeply about the future"

into the future and to hold them there until such time as there are new options to resolve them. This constrains the innovation space for good quality strategic conversation in the diplomatic and highly ritualistic proceedings of regional and international organisations. One the other hand, there is a proliferation of ad-hoc global partnership initiatives that operate as *de facto* temporary institutions, each focussing on the specific challenge they perceive to be most significant to the common, human future in a more

globally connected world. National and regional governments need to enhance their capabilities for strategic foresight to enable a new era of global governance.

Redirecting leadership attention and enabling prospective judgement

Strategic foresight redirects leadership attention from knowing about the past to exercising prospective judgement about things that have not yet happened, in effect, by learning with a manageable and memorable number of alternative futures. As such, it offers a social learning journey that can avoid the trap of 'if only' by asking 'what if'. It is the solution to the eternal firefighting that becomes established in organisations that project retrospective analysis to look forward.

Good leadership involves individuals making tough decisions in uncertain times. Great leadership involves creating the future – bringing different people and organisations together to make real what exists in the imagination. The difference between 'gut feel' and strategic foresight pivots on the quality of strategic conversation.

"Strategic foresight offers a social learning journey that can avoid the trap of 'if only' by asking 'what if'"

Exercising good judgement about things that have not happened is the fundamental evolutionary advantage of healthy society and human flourishing.

"Good leadership involves individuals making tough decisions in uncertain times. Great leadership involves creating the future"

Strategic foresight can support the process of vision-into-action– recognising that strategy is a storytelling process of implementing leadership imagination! This state-of-the-art practice is to combine conventional policy assessments with participatory visioning, to clarify strategic choices and agree a set of clear and measurable goals and supporting indicators. Then, to maintain vigilance in implementing action to signals of contextual change that might invalidate the plan.

What can obstruct it?

Achieving the shift from producing a report of forecasting-based, policy analysis to using strategic foresight is a culture change, rather than a substitution and upgrade in tools. Leadership attention and champions are key to creating the space and time for effective development and use of foresight and in encouraging and incentivising the accompanying change in behaviours.

It is important to be attentive to multiple barriers in the authorising environment. These include:

- **Emotional barriers:** fear of the future, anxiety about uncertainty, which can be overcome by being positive and realistic.

- **Culture barriers:** an organisational bias towards the short-term, a lack of behavioural incentives, e.g. with zero

tolerance of failure or rewards only for those who step up in a crisis. These can be overcome by building a political culture that rewards farsightedness and commitment devices of various kinds to ensure that governments give adequate attention to future risks, threats, vulnerabilities, etc.

- **Institutional barriers:** lack of culture of conversation, strong silos, limited capacity for joined-up thinking and action planning, leadership power contests, and time delays between thinking-action processes.

Authorising environment

Who has power?
How are
decisions made?

Are you working with an existing user or a fluid, manufactured user group? Is the user = producer?

Politics: People & Power	Organisation Setting

Culture & Mindset

Are leaders rewarded for creating new ideas and realising new opportunities? Is there a dominant culture of decision making forecasting or conversation based?

Source: A. Wilkinson & K. van der Eslt

STRATEGIC FORESIGHT IN PRACTICE: HOW TO DO IT?

Why and when to use strategic foresight

In the new and still emerging reality it is more important than ever to think about the future and equally important to evolve our approach to futures thinking:

"The future is always a story"

1. We cannot rely even on the best experts to predict the future – all facts are 'of the past'

Experts are getting better at forecasting, but the future is not the same a long range analysis and it cannot be predicted. Despite an increasing abundance of information (Big Data) the future is empty of facts. The future is an entanglement of intuition, imagination, and emotions - hypothesis and hunches. Assumptions about the future are critical to thinking, analysis and decision-making and they are always in operation in any decision situation, often at an implicit/tacit basis. There is value in revealing, testing and resetting deeply held assumptions and intuitions. Making the future explicit, testable and contestable provides a way to refresh the present. Unexamined future assumptions are a major source if surprise and uncertainty.

2. The future cannot be directly experienced; it can already be perceived and experienced through storytelling

The future is always a story – the story is imagined, communicated and shared through the different processes of storytelling – including interactive theatre, role play, group model building and gaming. Stories of new and different futures are always emerging. These stories are rendered and shared in different forms – narratives, numbers and images. Our depth of perception of reality can be enhanced through different ways of knowing – scientific, artistic, mindfulness. We can simulate

future experiences through storytelling and the design and prototyping of new artefacts. A good story motivated new action. Storytelling also reflects our capability to be creative. Storytelling harnesses imagination and, as such, can be used to support, make explicit and test judgements about things that have not yet happened.

3. Global new reality is socially complex: strategic knowledge exchange is key to new shared understanding

It is important to engage on a regular or ongoing, rather than one-off, basis with different perspectives of the future and to forge new shared sense through the exchange of perspectives and the process of strategic conversation. Building new common ground is key to flexible cooperation and the future can be used as a safe space for constructive conflict, to reveal and respect different perspectives and enable disagreement to be used as a learning asset. It is important to keep refreshing the new common sense enabled using strategic foresight processes. Conventional wisdom is out of touch with fast moving and socially diverse new realities. Any form of futures thinking is transitory and has a 'shelf life': it can be very entertaining to read what past societies thought about the future.

4. Organisations can better prepare and shape the future by learning with plausible alternative futures to develop new collaborative strategies

Many of the significant challenges facing societies across the world today are not simple problems that can be easily solved by breaking them down into smaller and smaller parts i.e. using specialist and disciplinary-based knowledge of each part and identifying the optimal solution in separate domains of policy. Instead, societies are facing connected challenges and so-called 'wicked problems'. Addressing these requires developing a shared understanding of the bigger picture and working with more than one, but not too many futures to reframe and reperceive existing and new options. By maintaining the future as an open perspective that refreshes our understanding of the present, we can enable flexible cooperation and support new collaborative strategies.

Principles for effective practitioners

There is no single or best approach, but there are four basic principles to guide effective practice:

1. **Purposeful design.** A foresight intervention process is initiated in response to a common concern. It is designed for use. It is phenomenological and not undertaken for the sake of studying the future but aimed at supporting a change

in behaviour and new action. It is essential to clarify the purpose of the intervention and what success looks like from the outset. There is no audience in a foresight process. The value of strategic foresight does not come from reading a report but from engaging with the relevant users from the start and, if necessary, manufacturing a core 'user' group. Learners need to be engaged to achieve the fullest benefits.

2. **Craftsmanship.** Like riding a bicycle – you will learn by falling off. Working with the future involves craftsmanship. It takes practice to master a diverse toolkit; skilful application is honed through continuous improvement. It requires being attentive to the authorising environment and the barriers to success this can present. Sharing success and learning with failures will help to avoid repeating mistakes. The appropriate choice and sequencing of methods depends on the purpose and user(s).

3. **Collaborate and create empathy** – appreciating diversity and embracing differences leads to deeper understanding of the whole system and to better solutions. Transformation is not the same as incremental improvement: inclusiveness and empathy are key to large scale creativity, social learning and collaborative innovation processes.

4. **Be open and humble.** Avoid the trap of hubris – strategic foresight does not claim to get the future right. All knowledge of the future is transitory: any strategic foresight 'product' has a shelf life.

The emphasis in designing an effective foresight intervention is on choosing the appropriate method for the task in hand.

- What is the purpose of developing foresight? E.g. setting directions, clarifying strategic choices, policy review, designing new policy options, engaging diverse policy shapers?

- Who is the intended user(s) and how/when will they use the foresight?

- What does success look like to the user?

- What resources are available?

Once you have answers to these questions, then and only then, is it possible to design an effective intervention. The process is facilitated and draws on interdisciplinary and multi-disciplinary expertise rather than being expert-driven. The facilitator is not the source of futures knowledge but operates as a 'Futures Midwife'.

Common traps and pitfalls in strategic foresight interventions

	Success factors	Sources of failure
Purpose	Clarity about who will use the foresight, how and when.	Failure to manufacture a coherent user and align on a specific purpose. Lack of agreement about who will use the foresight, when and to do what.
User(s)	Identified and engaged from the start. Sometimes it is necessary to manufacture a 'single client' from a diverse group of users in different organisations.	Selling an analytical report to prospective users who have not been engaged in the foresight process.
Authorising environment	Secure a high-level champion. Start with a modest piloting initiative. Share examples of how others 'we' admire are doing it.	Lack of incentives for forward acting leadership, a culture of blame and no tolerance for learning with failure.
Governance	Engage users from the start – by proxy if not in person. Clarify and agree a participation mode e.g. who decides which futures are important to consider and how (core team, consultation with X, coproduction with XYZ, etc.). If 3rd party funders are involved, ensure they can guide the process but not dictate/influence the choice of plausible futures.	Lack of clarity about who decides and how and on what basis which futures need to be considered and why.
Quality of strategic conversation	Careful design of the whole process by an experienced facilitator. Space and time for generative dialogue and constructive disagreement.	Inexperienced facilitator. Absence of a culture of conversation. Misunderstanding of the role of narrative in meaning making by quantitative cultures.

	Success factors	Sources of failure
Immersive learning	Use of storytelling and experiential learning techniques which enable new memories of the future to penetrate the cognitive barriers that keep us sane, happy and focussed.	Failure to overcome the narrative barrier of the front neo-cortex of the brain.
Timing	Embed the foresight process, linking with and across all phases of the policy cycle. Develop mechanisms to sustain intervention across political cycles and changes in leadership. Clarify when new insights developed in the foresight can be used in decision-making and to support new action planning.	Initiating a foresight intervention without attention to the different phases of the policy cycle. Failing to link/embed into wider decision processes from the start of the intervention.
Choice of methods	There is no single, best method but a choice of methods and the selection and sequencing of methods should reflect the purpose in hand and the authorising environment.	Sticking to the way we do things around here!
Evaluation of impact	Design of an intervention and use of a developmental evaluation framework. Clarifying measurable success before starting the intervention.	Emphasis on inputs and outputs e.g. number of experts, reports, citations (without evidence of use).

Source: A. Wilkinson

THE FORESIGHT METHODS

Foresight is a purposefully designed, intervention process. It does not claim predictive power but maintains that the future is open to human influence and creativity.

There is a diverse toolkit of strategic foresight methodologies which fall into three main types – possible, plausible, and preferable futures thinking:

- **Possible** and still emerging futures – horizon scanning

- **Plausible** futures – including megatrends analysis and exploratory scenario planning

- **Preferable** or normative futures – including visioning (and backcasting) and design futures

A helpful place to start is to appreciate the general differences between forecasting and foresight. The next step is to be able to appreciate the differences, strengths and contingencies of the diversity of and within strategic foresight methods.

Common methods used in policy-relevant foresight

Methodology	Future as...	Characteristics
Horizon scanning	Events and trends – open and still emerging	Systematic scan and collection of events and trends Output: a future-scape/visual mapping of new signals of change
Megatrends analysis	Pattern shifts – interacting trends	Analytical-discursive process Output: THE story of the future (singular) and a plan of action
Visioning (and backcasting)	A preferred direction – a description of a preferred future state used to guide pathways for progress	A preferred direction – a description of a preferred future state used to guide pathways for progress Output: A shared understanding and explicit description of THE preferred future and a medium term roadmap detailing specific actions for making progress towards the vision

Methodology	Future as...	Characteristics
Scenario planning	A set of plausible stories of the future content, not the self, that are coming at us from the future whether we want them to or not	Interactive and iterative, intellectual and social learning process which involves interviews and strategic conversation and is supported with analysis and modelling Output: a set of 2,3 or more stories of plausibility-based/exploratory futures (multiple) and how these might come about
Policy gaming	A 'serious' game – behavioural insights about the interaction of key actors in response to a novel event or hypothesised future situation	An immersive learning process that simulates and test the preparedness of a group/organisation to deal with an unfamiliar future event/situation
Design futures	Better – an interactive and iterative process of goal-orientated incrementalism	Creative-immersive learning process involving the design of new and better future possibilities/products Output: a viable prototype

Source: A. Wilkinson

"Experts are getting better at forecasting, but the future is not the same a long range analysis and it cannot be predicted"

Forecasting

Forecasting is a data-rich activity. In forecasting we extrapolate the past. There are no breaks in logic allowed. The future is assumed to be fully contained in the statistically significant evidence base. The emphasis is on the predictability – accuracy, reliability and precision – of outcomes. Forecasts can be used by anyone for anything.

Forecasting can be undertaken as an act of probabilistic prediction, an assessment of the most likely future. Or if can offer a conditional, evidence-based projection – a baseline that assuming all other things remain equal, identifies the cone of possible outcomes: the singular future in terms of a high-, best-, medium-, low-, worst-case 'scenario'.

Forecasting	Foresight
GDP growth in Ukraine next year	Implications of continued Russian incursion into Ukraine
Occurrence of extreme droughts in in Sub-Saharan Africa in coming years	New waves of regional migration into Europe
A company's share price next week	How the company's share price will evolve over the next year
EU consumer spending over the next two years	How consumer preferences and behaviours will change in the next five years
Projection of job losses due to increasing uptake of industrial robots	The productivity paradox: will/when will the creation of new digital economy jobs exceed the loss of industrial economy jobs

Source: A. Wilkinson

Horizon scanning

Horizon scanning is an ongoing systematic process aimed at detecting early signs of new and different futures and disruptive developments: It seeks to determine what is constant, what may change, and what is constantly changing in the time period under analysis.

"If you see a fork in the road, take it" - Yogi Bear

Horizon scanning is also known as contextual and environmental scanning and can take the form of an open search, a focussed scan, a Delphi scan or even a multi-lingual, data-mining meta-scan!

Outputs can be presented as quantitative trends, a visual 'future-scape' mapping of qualitative themes, or a discourse analysis. Inputs can be restricted to expert opinion and official sources or unrestricted and involve crowdsourcing and/or be collated

through a demi-structured interview process. The most common aim in horizon scanning is to open up thinking and strategic conversation to new future possibilities and avoid 'blind spots'. Scanning can also be used to close down the future by identifying consensus about business-as-usual expectations (expert-led, Delphi scan).

There are four key stages in the scanning process: (1) scan and identify – discover; (2) track and monitor – evaluate; (3) research and analyse; – understand; (4) socialise and strategise – take action.

Horizon scanning

Benefits	Methods	Tools	Examples	Challenges
Systematically scan and collect events and trends from diverse information sources to enabling a broader base of futures knowledge to be legitimised than the statistically significant evidence base of the past	Open Scan Targeted Search	Desk top research using a variety of tools: Data mining Sentiment analysis Bibliometrics Regression analysis	OECD Next Production Revolution Meta-Scan 2015 Policy Horizons Canada Technology Scan 201x	Ongoing (low intensity) process that requires active management and cannot be fully outsourced Redirecting attention to new developments Trade off: comprehensive vs. comprehensible

Benefits	Methods	Tools	Examples	Challenges
Anticipate, detect and prepare for early signals of disruption	Delphi Scan	An iterative assessment of future developments involving a pre-qualified panel of experts. Conducted in several rounds of interview- or-online surveys and aimed at clarifying consensus.		More resource and time intensive – time for effective engagement of experts Drive to consensus can overlook important 'outliers' (weak signals)
	Multi-lingual meta scanning	An analytical-discursive process involving different disciplines and enabling strategic knowledge sharing across different linguistic traditions	New Contours of Conflict, Hague Centre for Strategic Studies	Resource intensive – time and capacity to collate and interpret signals in different languages

Source: A. Wilkinson

Megatrends analysis

A trend is a quantitative or qualitative description of a change of an observable phenomenon that is expected to continue to move in a known direction, along a continuous line of change (linear, volatile, exponential) over a specified period of time. Trend impact analysis involves identifying the impacts of trends and the implications of these impacts for decision making.

A megatrend is not a single trend in history but represents the slow build-up of new momentum from a combination of many different trends.

"A megatrend is defined as a major shift in environmental, social or economic conditions that will substantially change the way people live" - Our Future World, CSIRO 2012

Megatrends are deep-set trajectories of change – pattern shifts – often with decadal timeframes. They occur at the intersection of multiple trends which relate to more tightly defined topics, geographies and time periods. By working with megatrends, policymakers can consider the questions: what has already happened but has yet to fully manifest and will catch up with us in future? How can we better prepare for the inevitable changes that will impact multiple domains of policy and strategy?

A megatrends analysis provides a conceptual framework to help leaders and their organisations to think about and prepare for inevitable pattern shifts that will occur in a decadal timeframe. It redirects attention to inevitable, underlying pattern shifts where causal logics are complex and cannot be fully known ahead of time.

Box 2: Megatrends methodologies

Based on an exchange of national megatrend experiences by members of the OECD Governmental Foresight Community in 2014, the key steps in the megatrends methodology are: (1) list and develop a typology of megatrends; (2) decompose to operationalise; (3) translate into national trends; (4) explore dynamics and timing of impacts; (5) match megatrends to sectoral priorities; (6) identify new threats and opportunities; (7) explore impacts on markets and implications for technology.

Principles of good practice emerging from this initial exchange on megatrend case studies are:

1. **Linking action to agenda from the start**, i.e. identify users and their uses before developing the analysis: This is made easier with a mandate that prescribes the use of foresight in policy, but can be achieved bottom-up by an authoritative independent study which clarifies implications for policy;
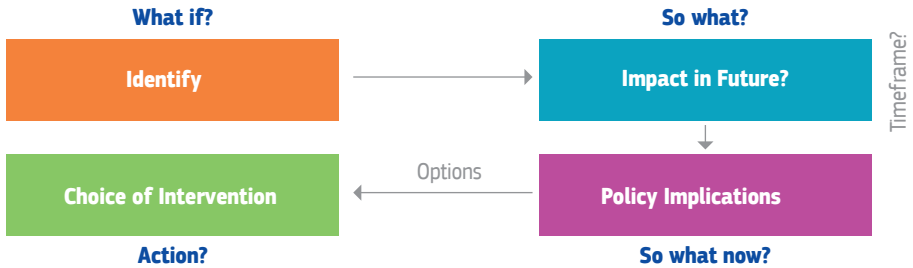
2. **Making it nationally relevant**: the translation of global forces into a national strategic agenda is a critical step;

3. **Understanding the dynamic of impact**, in terms of when threats and impacts materialise;

4. **Encouraging policymakers** to consider reactive vs pro-active policy options;

5. **Adopting an inclusive policymaking approach**, engaging key stakeholders in the process e.g. involving the private sector in the process to source investment in new solutions.

Megatrends process

What if?		So what?
Identify	→	**Impact in Future?**
Choice of Intervention	← Options	**Policy Implications**
Action?		**So what now?**

Timeframe?

Source: R. Warner

Megatrends

Benefits	Approaches	Methods	Examples	Common traps
Agile and flexible approach to appreciating the interactions of trends	No standard methodology: a multistep process using a combination of analysis, discussion and creative thinking.	Brainstorming Storytelling Cross impact matrix Trend impact analysis	OECD	Ad-hoc futures – no logical frame for clarifying which futures need to be considered and why
Anticipate shifts in patterns e.g. rapid ageing of societies	*same as above*			Can be misused to support attention to comfortable developments rather than used to challenge business-as-usual thinking
Develop shared sense of future outcomes and use to test existing policies and design new policy options				

Source: A. Wilkinson

Scenario planning

Plausibility-based or exploratory scenario planning involves building and using a set of plausible, alternative stories that can be used to reframe the present situation.

"The fish is the last to know it swims in water" - Chinese proverb

Scenario planning involves engaging and respecting different perspectives to develop deeper and more shared understanding of global causal logics, using this to forge new common ground and through a process of strategic conversation develop and sustain flexible, cooperative interventions. A set of scenarios comprises two, three or more stories that reflect the causal logic and behaviour of the wider, underlying (socio-technological-ecological) system, which is relevant to a specific decision making, strategic planning and/ or understanding a new situation of concern. Scenario planning comprises an iterative and interactive intellectual and social learning process that uses a combination of storytelling and systems thinking to map out the interaction of actors and factors and interplay of events, interests and contexts and via a process of strategic conversation enable strategic reframing and re-perception (see Box 3).

Plausibility-based, scenarios planning (the term exploratory scenario planning can also be included) starts with a qualitative inquiry which maps assumptions, agreements and disagreements of what might, or could happen from the perspectives of specific users and their needs.
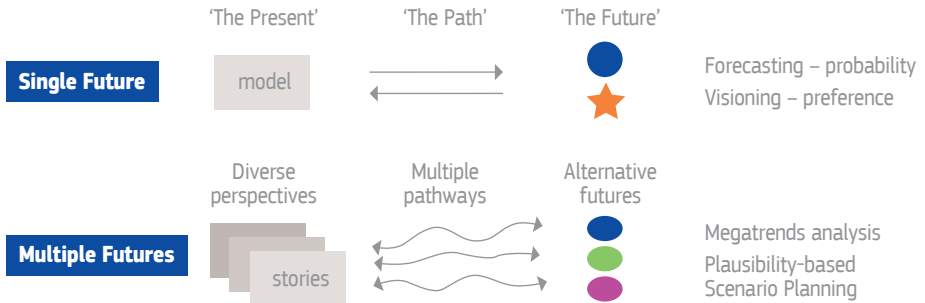
A set of two, three or more scenarios is then created using the coproduction of plausibility as the guide to attention to the future. The scenarios are developed through a social learning process of storytelling and systems thinking, and an iteration between strategic conversation and analysis. The output is a set of story maps (events in time), or systems maps (interaction of drivers of change, time-independent system). Quantification can be used to check internal consistency of each scenario and to illustrate each, but plausibility-based scenarios are not derived from a quantitative model – they are not the same as the sensitivity analysis of model-based conditional projections. A set of scenarios does not describe the uncertainties within a model, but rather the conditions under which the existing/default model might be invalidated.

Scenario planning

Benefits	Methods	Tools & Techniques	Examples	Common traps
Reframing and reperceiving – ability to consider more and better options	Many different plausibility based/exploratory scenarios building methods, including:	Storytelling Systems thinking	World Energy Scenarios 2016 – The Grand Transition UNAIDS: Three Scenarios for 2025	Confusion: not same as quantitative model based conditional projection and forecasting with sensitivity analysis
Reveal and test deeply held assumptions	– Indictive; deductive; abductive; critical futures; perspectives-based.		US NIC Paradox of Progress: Three Global Scenarios 2017	
Engage constrictively with uncertainty and ambiguity – reveal and respect different perspectives, create a safe space and enabling conflict to be managed as a learning assets	In common: • Using plausibility as a guide to the future • Working with 2,3 or more alternative stories of the future • Stories describing the wider context (strategic landscape, not the self) and how it came about • plausibility as a guide to the future • plausibility as a guide to the future	Group model building e.g. rich pictures, lego modelling Quant modelling (illustrative purposes, consistency check)	World Energy Scenarios 2016 – The Grand Transition	Failure to use/ use effectively: lack of engagement with users/ did not clarify purpose and use at start; not linked/ imbedded with decision process; focussing on marketing a report rather than designing a new service.
Forge deeper and shared understanding – new common ground in developing shared visions				Lack of leadership capabilities – open mindfulness, strategic conversation

Source: A. Wilkinson

Comparing methods

	'The Present'	'The Path'	'The Future'	
Single Future	model	→ ←	● ★	Forecasting – probability Visioning – preference
Multiple Futures	Diverse perspectives stories	Multiple pathways	Alternative futures ● ● ●	Megatrends analysis Plausibility-based Scenario Planning

Source: adapted from OSP/A. Wilkinson

Plausibility-based scenarios are not assigned probabilities – individually or as a set. Nor are they designed as all good vs. all bad future outcomes. Rather than trying to identify the most likely, or choose the best/preferred scenario, the aim is to keep the whole set in use.

This whole social learning process is only completed after several iterations of the reframing and re-perceiving loop enabled by building and using scenarios – see Box 3.

Box 3: Strategic planning and decision-making in a 'TUNA' world

Ramirez and Wilkinson (2016) clarify the premises that underpin the effectiveness of plausibility-based scenario planning:

1. **Many organisations are facing unprecedented 'TUNA' conditions** – _T_urbulence, _U_npredictable uncertainty, _N_ovelty, and _A_mbiguity

2. **'TUNA' conditions require new approaches to strategic and policy planning** that seek to balance competitive and collaborative opportunities

3. **An explicit, shared, and flexible sense of future is called for in 'TUNA' conditions**. It can be enabled by contrasting plausible, alternative future contexts through an iterative process of reframing and re-perception.

4. **The 'aha' moment of impact** is only realised once the reframing-re-perception cycle has been completed. This can require several iterations.

5. **A social learning culture supported by scenario planning** can avoid the extremes of groupthink and fragmentation, which are pathologies preventing learning in organisational settings.

6. **A reframing strategy** is a distinctive capability that enables learners to identify new opportunities, and more and better options.

7. **Scenario planning** can help develop new social capital to renew the licence to operate.

8. **The future should be positioned as an active sense**, already in the present, not still to come, and a domain of assumptions, not facts (which are always of the past).

These authors described seven plausibility-based scenario-building methods and provide six case studies demonstrating the return of investment in scenarios in terms of the different purposes, intended outcomes and impacts in each case.

The principles of good practice of building and using scenarios in policy settings include:

1. Embedding the scenario work in wider policy processes;

2. Using a combination of stories and modelling for impact;

3. Ensuring the producers of the scenarios are regarded as legitimate and authoritative;

4. Ensuring consumers – policymakers – understand the role of scenarios;

5. Providing policymakers with the opportunity to learn with scenarios at relevant points throughout the process.

BOX 4: Scenarios example: a new world order?

In 2014, the OECD developed global scenarios to support strategic dialogue on the future of investment and jobs at its annual Ministerial-level assembly. The scenario framework comprised three story archetypes, which were inducted from a review of 50 sets of global scenarios published by reliable sources since 2010. In the process two other archetypes were rejected: heaven/all good vs hell/all bad storylines. An international group of OECD national experts in governmental foresight developed the storylines and the scenarios were presented in the form of a six-minute video as a scene setter to the strategic dialogue. The three scenarios were called:

- **Quick fixes:** a reformed multilateral order (China led/included, with digitally em-powered citizens enabling faster bottom-up feedback loops, and an uneven digital productivity boom).

- **Multipolar:** a new world order, reordering pluralism, regionalism-enables-globalisation, smaller but more effective global agenda, different pathways in digital productivity boom.

- **City power:** a more bottom-up order emerges and realigns top order; alignment of na-tional-urban policy frameworks to avoid risk of growing divide of urban vs. rural in push to localised, circular economies enabled in an era of digital globalisation.

In 2016, the US National Intelligence Council published a report, entitled Global Trends: Paradox of Progress, as part of its mandate to prepare a briefing for each incoming President. The analysis presented in the report suggests that there will be an increase in tensions between states in the medium term next. The Report outlines three alternative world orders that might emerge in the longer term:

- **Islands:** There has been strong push back against globalisation, and governments are challenged in meeting society's needs for economic and social security in the context of slow growth and disruptive technologies transforming work and trade; some gov-ernments are more successful than others.

- **Orbits:** A fragmented world order where competing powers seek own spheres of in-fluence in the context of rising nationalism, disruptive technologies, decreasing global cooperation, and interstate conflict.

- **Communities:** Rising expectations and diminished capacity of governments open space for local governments and private actors to provide some of the services typi-cally provided by government; some governments resist, but others cede some power to the emerging networks.

Policy gaming using scenarios

A serious game is designed for a primary purpose other than pure entertainment. The 'serious' adjective is generally prepended to refer to products used by industries like defence, education, scientific exploration, health care, emergency management, city planning, engineering, and politics. For example, war games are used in military settings to rehearse battle plans. The entire process often takes only a few days but involves considerable preparation and post-play analysis.

Policy gaming is a versatile method for eliciting a shared vision in confusing, exceptional and urgent situations, where precedent is of little value. The game takes the form of a carefully designed process that provides opportunities for an improvisational rehearsal of responses to a simulated real-life situation, to generate new insights about human behaviours.

A policy game takes the form of a simulated interaction that combines interactive dialogue with computer-based simulation. It is usually designed around a specific event (a tipping point or crisis of some kind, e.g. a new financial crisis.) that reflects an unprecedented situation that might happen in a plausible, relevant and challenging scenario. The computer-based modelling and simulation can be performed in real time, or multiple simulation runs can be recorded in advance.

In each round the participants are provided with an update of the situation and required to discuss and indicate how they will react. The combined responses are synthesised and used to recalibrate the situation and set the scene for the next round of discussion, reaction and interaction.

At the end of the game, discussion focused on learnings and new behavioural insights. Policy gaming can be scenario-based i.e. exploring reactions to a novel situation for which there are no existing or known solutions in the history of human experience.

"A painful and conflict-ridden collective thought experiment is much more desirable than a conflict-ridden and stalled implementation process." (Geurts et al., 2007, pp. 535–559)[4]

Box 5: Example of event-based policy gaming design

Introduction and scene setter

Presentation of the specific situation – for example tipping point situation/crisis trigger event

Round 1: initial positions and responses in role-play teams/ table group

Discuss the situation specific actor/organisation of actors seen from a number of different actor-role play perspectives.

- What policy action is needed to effectively respond to the situation and deal with it effectively?

Each individual/organisational perspective group shares their response. An update on the situation is provided – this reflects a real-time simulation of the impact of the actions.

Round 2: in same role play groups

Based on learning about the interaction of reactions–each role play actor adjusts their strategy. A further update on the situation is provided – this reflects a real-time simulation of the impact of aggregated actions. Repeat as necessary.

Closing reflections

Reflection by facilitator on voting patterns. Invitation for closing reflections: What have we learned?

Normative futures – Visioning and design futures

A vision is a normative description of an imaginable future (preferred or to be avoided) which reflects shared values and motivates a change in action. Positive visions are developed to help clarify and reduce the gap between the expected 'business-as-usual' outlook and an agreed, 'better' outcome. Imaginative and inspirational visions are needed to realign values, help forge new common ground and provide strategic direction that is essential to shared agenda setting, inclusive prioritisation and cooperative action planning. To avoid unrealistic dreaming, it is necessary to tether a vision to reality.

"To assess hope we have to measure the future" - *António Vieira*

Translating a vision into actionable policies can be achieved through a process of back-casting from future to present to identify strategic priorities, goals and indicators that are relevant to designing a robust policy pathway and tracking and measurement of progress. Exploring how the goals are linked/interact with each other can be useful for discovery of new cross-cutting, horizontal solutions spaces that cannot be seen or populated by working from within any one policy domain. Designing new policies (experiments) within each new solution space followed by fast, safe-fail iterative learning (prototyping) enables agile strategies to emerge and adapt as progress to the vision is achieved.

Normative and design futures

Benefits	Approach	Methods	Examples	Common traps
Implement an imaginable and preferred future Create and shape new and better future possibilities	Visioning and backcasting	Visioning Backcasting Road Mappping	WBCSD Vision 2050 Slovenia Vision 2050	Failure to translate vision into actionable and measurable goals Failure to consider and pilot new policy solution spaces and instead focus on available tried and tested options
Support iterative and interactive bottom up strategy or goal-orientated incrementalism	Design Futures	'Provotyping' & Protoyping	Redesigning public services	Assumption of idealistic society Single futures thinking can limit ability to engage effectively with uncertainty

Source: A. Wilkinson

Normative futures

'my/ our preferred future'

The Roadmap

Normative Future
Visioning & Backcasting

Design Futures
Goal-orientated incrementalism

Current situation

It's lousy/ could be better

Provotyping & Prototyping
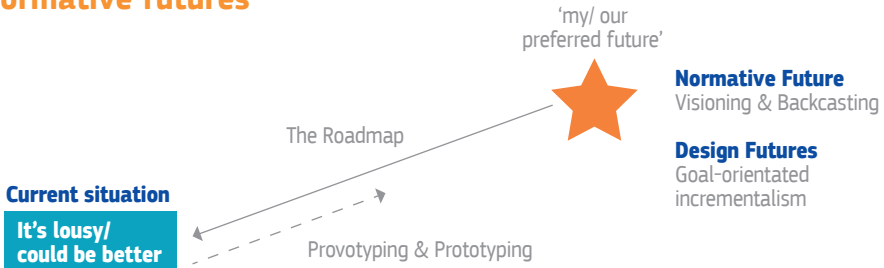
Source: A. Wilkinson

Vision–into–action process

Vision	Strategy			Action
Where would we like to be in 2050?	**How to get there?**			**From words to deeds**
	Strategic Priorities	**Goals**	**Indicators**	
Picture or description of a country/ society/ individual in 2050	Areas of development until 2030 on which we need to build to bring the Vision 2050 to life	Milestones that we need to reach to implement strategic priorities Concrete, Measurable and Timeframed	Measurements that show how successful we are in reaching our goals	Action plan Concrete projects Structural reforms Budget

Source: A. Wilkinson & K. van der Elst

Design futures

We are all familiar with the way in which companies bring new products to the market. They develop a prototype a new product/devices/service. Using a process of interactive design the test and refine the original design through simulated and real-world use, making improvements and learning through failure, as well as what works.

A prototype can be thought of as a physical embodiment of a 'What if…?' card. It is an untested hypothesis about the future that can be accepted, rejected or reimagined by those that engage with it. A prototype is introduced in the early exploratory phases of the design development process to cause a reaction—to provoke and engage people to imagine possible futures. Prototypes are designed artifacts that

are informed and inspired by emerging technologies, user interviews, and co-creative engagement with end-users and organisational stakeholders. They can be used as a quick and effective means to explore a problem/solution space by providing tangible ideas to spark discussions. Here the goal is not to evaluate the artifact but to pick it apart, manipulate it and explore new directions. In doing so, the artifact ignites discussions around deeper unmet needs or ideas for possible futures.

Design-orientated and vision-based preferred futures are reflexive in that they aim to create reality through a process of bottom-up, goal based incrementalism rather than top-down, grand strategies and detailed blueprints.

"A prototype can be a physical embodiment of a 'What if…?'"

SUGGESTED FURTHER READING

Global Megatrends – Seven Patterns of Change Shaping Our Future Stefan Hajkowicz. May 2015. CSIRO. Australia. See also https://publications.csiro.au/rpr/download?pid=csiro:EP126135&dsid=DS2

Learning with futures to realise progress toward sustainability: The WBCSD Vision 2050 Initiative. Wilkinson, A. & D. Mangalagiu, 2012. Futures, 44(4), 372-384.

Living in Futures, Harvard Business Review, May 2013 https://hbr.org/2013/05/living-in-the-futures Global Trends - Paradox of Progress, USA national Intelligence Council, January 2017. https://www.dni.gov/index.php/global-trends/the-future-summarized

Strategic Reframing, The Oxford Scenario Planning Approach, Rafael Ramirez and Angela Wilkinson, March 2016, OUP, Oxford.

Working with Wicked Problems, Philippe Vandenbroeck, shiftN http://www.issuelab.org/resource/working_with_wicked_problems

Illustrative examples of policy-relevant strategic foresight

Initiatives	Scale and Mode	Main Purpose	Methods
MetaScan 3: Emerging Technologies, Policy Horizons Canada, 2014 http://www.horizons.gc.ca/eng/content/metascan-3-emerging-technologies-0	Organisational, expert-led assessment	Forward Technology Assessment	Horizon Scanning
UK Government Office for Science, Future of Cities project, 2014-2016 https://www.gov.uk/government/collections/future-of-cities	Inter-organisational, expert-led assessment	National policymaking	Megatrends & Scenarios
AIDS in Africa: Three scenarios to 2025, UNAIDS, 2005 http://data.unaids.org/Publications/IRC-pub07/jc1058-aidsinafrica_en.pdf	System, participatory (multi-stakeholder coproduction)	Regional Governance	Scenarios and modelling
Resource scarcity The Future Availability of Natural Resources http://www3.weforum.org/docs/WEF_FutureAvailabilityNaturalResources_Report_2014.pdf	Inter-organisational, multi-stakeholder consultation	Collaborative strategy	Forecasting, Scenarios & Interactive futures design
World Business Council for Sustainable Development (WBCSD) Vision 2050 – The new agenda for business http://www.wbcsd.org/Overview/About-us/Vision2050/Resources/Vision-2050-The-new-agenda-for-business	Business consortia-led , multi-stakeholder consultation	Collaborative innovation	Trends analysis, visioning and back casting

Initiatives	Scale and Mode	Main Purpose	Methods
UNEP Inquiry: The Financial System We Need – Aligning the Financial Systems with Sustainable Development: UNEP (2015) http://web.unep.org/inquiry/publications	Inter-organisational, multi-stakeholder consultation	Global Governance	Case studies and scenario planning
Slovenia Vision 2050 – National Development Strategy http://www.vlada.si/en/media_room/newsletter/slovenia_weekly/news/article/a_vision_for_slovenia_in_2050_59337/	System, societal coproduction	National Governance	Conventional policy analysis combined with strategic foresight (megatrends, visioning & backcasting, disruptors analysis)

Further details on two of the above examples of using strategic foresight on global policy challenges

Case Study/ Intervention	Why/ purpose	For who/ users and uses	How (method)	So what (impact/ outcomes)
WBCSD Vision 2050 **(World Business Council for Sustainable Development)**	Securing voice – a seat for progressive business at the global negotiating tables	Inter-organisational Global business leadership consortia supplemented with wider engagement with multiple stakeholders in different world regions	**Participatory visioning** Gap analysis and back-casting new pathways supported by **quantitative modelling** Development of an integrated **roadmap** Stress testing using **scenarios** Identification of new solution spaces	Forge new common ground Translated into action via local WBCSD chapters No feedback loop to capture bottom up learning

Case Study/ Intervention	Why/ purpose	For who/ users and uses	How (method)	So what (impact/ outcomes)
OECD Global Archetype Scenarios	Sense making – scene setter for negotiations on common agenda Open space for informal discussion about the impact of alternative global policy contexts on current investment and jobs policies	International organisation OECD member and key partner countries	Meta scan of existing **global scenarios, global trends** and **megatrends** literature to identify set of common scenario frameworks and develop new storylines to support **policy dialogue**	Re-directing leadership attention to emerging global developments and disruptive changes Building shared strategic vocabulary and understanding of the globally shifting landscape

POST SCRIPT: IMPLEMENTING IMAGINATION THROUGH SHARED VISIONS AND COLLABORATIVE STRATEGY

The Chartres Cathedral, also known as the Cathedral of Our Lady of Chartres was built in the Middle Ages at a site of pilgrimage, 80km southwest of Paris. It was completed in 1220 AD and its construction took over a hundred years. It was built in a time when there were no multi-story buildings. It is World Heritage Site and provides as inspiring example of how people worked together to learn their way into the future and in the process achieved unimagined possibilities. Those involved in its construction were clearly motivated by a sense of common purpose (i.e. to celebrate the glory of God on Earth), different communities of craftsmen set to work. There were no detailed architectural blueprints. No one knew what the finished building would look like. Everyone who started working on the project knew they would not live to see it completed. Even so, everyone who worked on the project performed to the very best standard of personal craftsmanship. Through a process of interactive and iterative design, build, trail-and-error, the magnificent edifice

"Imagining the future is exciting – creating it requires hard work"

started to emerge. Centuries later we are still in awe at this bottom-up innovation!

Moving forward centuries to a state-of-the art of scientific endeavour in the 20th century, the existence of the Higgs-Boson particle was proposed by a team of six particle physicists in 1964. No-one at the time knew how – or even if – it could be detected. Followed decades of design prototyping and trial-and-error experimental the particle was eventually detected through a process of theory-inspired, collaborative innovation. From the outset, no-one was sure how to detect the particle or even if it really existed.

Looking at these examples which are distant from each other in time and purpose, we start to discover some common characteristics about how to learn the way into the future. There were no detailed blueprints; the design was emergent. There was a shared vision and a common goal which sustained the endeavour over decades. Multiple communities of practice, with different tools and vocabularies, related to each other through a process of strategic conversation. There was a culture of deep craftsmanship, an ability to learn with and through failures, and the emphasis on shared successes. People, methods and practices changed along the way.

Endnotes

1. Question asked by HM Queen Elisabeth II on her visit to the London School of Economics.

2. See Strategic Reframing – The Oxford Scenario Planning Approach, by Rafael Ramirez and Angela Wilkinson. OUP, March 2016.

3. See above book, pages 116-119 for a description of each scenario-building method

4. Geurts, J.L.A., Duke, R.D., Vermeulen, P.A.M., 2007. Policy Gaming for Strategy and Change. Long Range Planning. 40, 535–558.
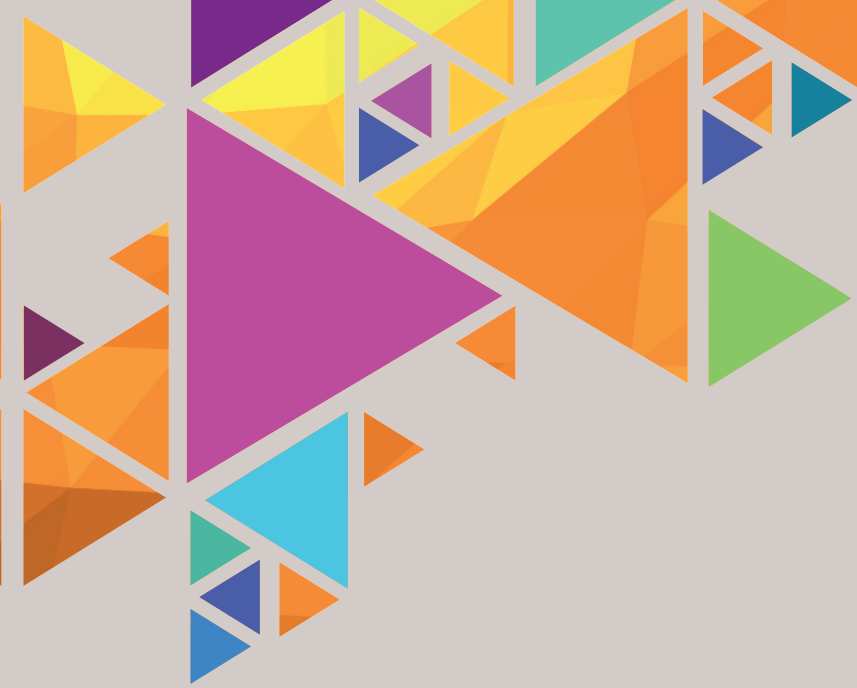
Angela Wilkinson

Senior Director, Scenarios and Business Insights, World Energy Council (WEC)

Angela is currently working with WEC members, global partners and patrons to anticipate prepare and shape the global energy transition for the benefit of all.

She brings 30+ years' experience in strategic advisory support to high-level leaders in government, business, and civil society, honed from working in public and private organisations in 20+ countries. She is a world class foresight and scenario planning expert: Angela has conducted over 100 futures projects, including the direction of large, international, and multi-stakeholder initiatives. Previous roles include Strategic Foresight Counsellor at the Organisation for Economic Cooperation and Development (OECD); Director, Scenarios and Futures Research, University of Oxford; Head of Special Projects, Shell scenarios. Board-level and International Advisory Board experience. Associate Fellow, Said Business School, University of Oxford. Fellow of the World Academy of Arts and Science. She has written two books on and published many articles on strategic foresight, scenario planning and global risk management. She is also CEO, Oxford Futures Limited – an independent consultancy specialising in helping leaders and their organisations to learn their way into the future. Angela has a PhD in Physics.