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# Risk, Organizational Culture, Scenario Planning and Policy Development

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# RISK, ORGANIZATIONAL CULTURE, SCENARIO PLANNING AND POLICY DEVELOPMENT

## Final Report

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### PROJECT TITLE:

Risk, Organizational Culture, Scenario Planning and Policy Development

1. Scenario Planning – Canada – Management
2. Organizational Culture – Organizational Governance
3. Futures Planning – Policy Development

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## 1. Purpose

### 1.1. Contract number

P1 9001 91

### 1.2. Objective

ACOA's Chief Risk Officer in the Evaluation, Risk and Advisory Services Unit requires an organization or individual with expertise in the field of corporate risk management to conduct research on scenario planning related to the Atlantic economy and prepare a report for the Agency on the topic.

### 1.3. Background

#### *Treasury Board Requirements:*

The Atlantic Canada Opportunities Agency is required to adhere to the Treasury Board of Canada's Framework for the Management of Risk and develop a Corporate Risk Profile that identifies the Agency's key risks and appropriate risk responses.

<https://www.canada.ca/en/treasury-board-secretariat/corporate/risk-management/guide-integrated-risk-management.html>

#### *Need for external input:*

ACOA's core responsibility is to support Atlantic Canada's economic growth and prosperity. To fully understand risks related to broader economic situations, the Agency requires external research and analysis on risks of relevance to the Agency's mandate. Internal expertise of risk analysis is limited and internal resources for economic analysis are also limited.

#### *Scenario Planning:*

ACOA's requirement for research to support its risk analysis is specifically for scenario research related to risk based on ACOA's specific mandate and mission: "The Atlantic Canada Opportunities Agency works to create opportunities for economic growth in Atlantic Canada by helping businesses become more competitive, innovative and productive, by working with diverse communities to develop and diversify local economies, and by championing the strengths of Atlantic Canada. Together, with Atlantic Canadians, we are building a stronger economy." (ACOA, 2018)

## 2. Executive Summary

This paper is based on a literature review conducted between June and August 2018 of the scenario planning literature. It also includes references to the International Risk Governance Council (IRGC) risk governance framework literature and Douglas's cultural theory literature.

*Risk Governance:*

### ***Our state of knowledge about a given risk influences the risk governance process***

Over the past two decades, numerous risk governance frameworks have been taking a more holistic approach to managing risk by incorporating contributions from several disciplines; these risk governance frameworks go well beyond simple risk calculations by signalling the importance of perception, process and social context. Many of the assumptions about the nature of knowledge and human nature within these academic disciplines are fundamentally at odds. As a result, there will always be tension at the heart of these models. They are roadmaps with signposts, not perfect solutions.

The IRGC framework helps distinguish between types of risk. As a starting point, it is useful to think about our state of knowledge of a particular risk and how this state of knowledge can influence the process and the actors with which we engage. The IRGC framework emphasizes learning and negotiation, particularly with uncertain and ambiguous risks.

Different risk problems demand different types of scenario planning. We typically have reliable data for simple risks; therefore, trends analysis or approaches that require quantitative data are usually an appropriate approach. As the data become more unreliable, as with uncertain and ambiguous risks, our approach to scenario planning will necessarily include more conversational, qualitative and process-oriented approaches with a larger number of stakeholders.

*Organizational Culture:*

### ***Certain organizational cultures can be fundamentally incompatible with other organizational cultures; they value different things, prefer different governance arrangements and apportion blame differently when things go wrong***

A cultural theory analysis helps us distinguish among the organizational types, and, in so doing, identify strengths, weaknesses and blind spots in the governance of different organizations and sectors. Hierarchists, for example, prize stability but they are much less successful at adaptive capacity and innovation. To be innovative, the hierarchist would have to partner with individualist organizations.

Egalitarians also struggle with innovation; large groups organized in an egalitarian manner are good at generating ideas but bad at making decisions and moving forward. Egalitarian groups build consensus, which is not generally associated with innovation or entrepreneurialism but rather middle-ground compromise.

Fatalists struggle with planning because they feel they have little control over their destiny. Fatalists' perceived vulnerability should encourage them to consider strategies to make their organizations more resilient.

Cultural theory helps us to see that during scenario exercises, there will be tensions at the heart of the process. While there is a high degree of interdependence among government agencies, not-for-profits and the private sector, the organizational design of many sectors is quite different, which makes coordination, cooperation and accountability more difficult to achieve. Cultural theory also suggests that when things go wrong, the tenuous relationships that organizations have in place to facilitate coordination will probably fall apart or at least be strained and tested. This tendency would undermine any attempt to have ambitious, coherent, multi-organizational strategies, particularly if the organizations are different cultural types.

### *Scenario Planning*

#### ***Definitions, Types and Strategies***

There is no universally accepted, singular, established method for creating scenarios. Some practices, like the 2 x 2 matrix (discussed in section 6.2) are more common than others, but the field of scenario planning can succumb to what Martelli (2001) refers to as “methodological chaos.”

The design of the scenario planning process is dependent on a variety of factors and can be structured through three key themes (Van Notten et al., 2003): the intent of the exercise (exploration vs. decision support), the quantitative data and expertise involved (formal vs. intuitive) and the number of individual factors considered (simple vs. complex).

#### ***Scenarios as a 2 x 2 Matrix and as Backbone***

The 2 x 2 matrix is often referred to as the “standard” tool in intuitive logics scenario planning (Van Asselt et al., 2010; Ringland, 2002; Ramirez and Wilkinson, 2014). This matrix consists of four boxes that are used to plot scenarios and two axes that often represent driving forces. Like most aspects of intuitive logics scenario planning, the 2 x 2 matrix can be used differently depending on the circumstance.

The conventional structure of an intuitive logics scenario planning exercise using the 2 x 2 matrix is referred to as the backbone. The backbone matrix is built by:

- a. Identifying and explaining key contextual drivers for the organization. In the backbone model these are the two factors that score the highest with regards to impact and uncertainty. They serve as the axes for the matrix.

- b. Developing different scenarios based on the organization’s key drivers. Each of the four possible scenarios is plotted out in the 2 x 2 matrix.
- c. Identifying policy and program characteristics that are suited to the scenarios that they generate.

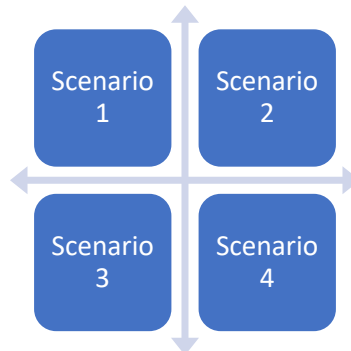


Figure 1: Matrix as Backbone

### Setting up the Exercise

For the purpose of this example, we are working through Derbyshire and Wright’s (2016) augmented intuitive logics method. Ramirez et al. (2008) outline some common practices in the chart below.

Characteristics
<ul style="list-style-type: none"> <li>• Participants should reflect a wide array of different views within the agency (heterogeneous rather than homogenous)</li> <li>• The individuals selected to participate do not necessarily need to reflect the composition of the agency, but all stakeholders’ interests need to be considered in some way</li> <li>• The event has to take place in an environment of mutual trust</li> <li>• The people come as individuals and do not represent the interests of the association</li> <li>• There are no hierarchies: all participants are at the same level</li> <li>• The event has to take place under social isolation, without common distracters such as daily work duties or family affairs</li> <li>• Ordinarily the number of participants varies: as few as three to as many as hundreds</li> <li>• The length of the process varies (two to three days, to 18 months, to less than two years)</li> <li>• Participants must attend the conference from the beginning to the end</li> <li>• Number of scenarios assembled (2 to 4)</li> </ul>

Table 1: Adapted from Ramirez et al., 2008, " Business planning for turbulent times: New methods for applying scenarios

### ACOA and Scenario Planning

#### ACOA: Selected References



A central tenet of the federal government's and ACOA's approach to the region is captured in the Atlantic Growth Strategy, aimed at driving sustainable economic growth. The Atlantic Growth Strategy has five strategic goals:

- Attract and retain a skilled workforce
- Foster greater business innovation, drive leading-edge technology, and generate new breakthrough ideas
- Respond to climate change and advance clean growth technology
- Create long-term growth and high-quality jobs through trade, investment and tourism
- Support growth, engage and connect people through infrastructure

ACOA's departmental business plan 2017–18 identifies two key risks: economic context and external capacity.

**Economic Context** “There is a risk that the achievement of results expected from the Agency's economic development programming may be affected by external factors that contribute to uncertainties for economic growth in Atlantic Canada” (ACOA 2017–18).

The Atlantic Growth Strategy is pursuing a number of initiatives to enhance the economic context, including enhanced trade and investment opportunities, improved infrastructure, increased innovation and pro-active stances on managing risks associated with climate change.

**External Capacity** “There is a risk that partner, community and client capacity for the identification, development and successful implementation of strategic projects may not be sufficient to support the optimal achievement of ACOA's program objectives” (ACOA 2017–18).

The Atlantic Growth Strategy is pursuing a number of initiatives to enhance external capacity, focussing in particular on developing a more skilled workforce, attracting more immigrants, improving infrastructure and increasing the region's capacity for innovation.

### *Stages to Scenario Planning*

The paper summarizes eight stages in the Scenarios Planning process:

1. Setting the agenda
2. Determining the driving forces
3. Clustering the driving forces
4. Defining the cluster outcomes
5. Impact/Uncertainty matrix
6. Framing the scenarios
7. Scoping the scenarios
8. Developing the scenarios

### ***Stage Three, Developed***

ACOA has partially done this in its departmental plan 2017–2018 by creating two clusters, economic context and external capacity. Any of the driving forces listed below (or related concepts) could be used as the key driving forces in a scenarios exercise.

Economic context includes the driving forces:

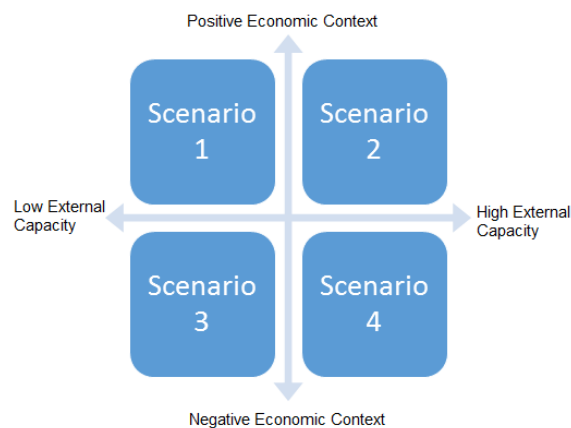
- Trade agreements
- Investment opportunities
- Infrastructure investments
- Innovation
- Climate change resilience

External capacity includes the driving forces:

- Population and immigration
- Skilled workforce
- Infrastructure investments
- Innovation

### ***Stage Six, Developed***

Selecting the two most impactful and uncertain clusters, we plot them as the axes on a 2 x 2 scenario matrix. As outlined in section 6.2 we are using the “scenario matrix as backbone” formula with a resulting four scenarios. In Figure 2 we use the clusters “economic context” and “external capacity”. We can, however, use more specific concepts, drawn, for example, from Stage Three above. The selection would depend largely on the goal of the exercise.



**Figure 2: Four Scenarios Presented in a 2 x 2 Matrix**

### ***Stage Eight, Developed***

The final step in the scenario development process is to work with members in the organization to describe the circumstances in each scenario. Starting with the end state of each scenario, work backwards and determine what it would take to make that scenario actually occur. What are the key events and structures necessary to lead to each scenario outcome? Determine who allows or motivates each scenario to occur and why it would unfold that way. Each scenario should consist of a narrative and an understanding of how that future would unfold.

This exercise is process-oriented and the purpose is to understand all the relevant factors that could contribute to different potential futures for the organization. The participants in this exercise are meant to bring this knowledge into their future work and policy-making decisions. A scenario is not a prediction of the future but rather an attempt at understanding all the causal factors that impact the organization and how to address them.

### ***Policy Development***

Derbyshire and Wright's process would stop at Stage 8. Others, however, would include a process of developing policies in light of these scenarios; the policies would be developed to evaluate new and existing programs, and determine if the programs should be supported in light of the four possible scenarios. In other words, the programs are not developed or approved because one scenario occurs but rather because they would be successful no matter which scenarios occurs.

### ***Next Steps***

Below are the recommended next steps:

1. A meeting between the MacEachen Institute and ACOA to discuss the findings and recommendations in the scenario planning paper
2. Discuss goals for a potential scenario exercise, for example:
  - Develop scenarios that will test ACOA's capacity to respond to principal risks as identified in the business plan
3. Discuss the potential of planning a scenarios workshop with the proposed structure in this paper. A one-page description of a one-day workshop that would include:
  - A guest speaker to talk about scenarios and resilience
  - A condensed version of the eight-step scenario planning process, focussing largely on stages seven and eight
4. A final paper summarizing the results of the workshop could be prepared and made available to those in the organization involved in futures planning.

### 3. Risk Governance: The International Risk Governance Council Framework

The International Risk Governance Council (IRGC) framework focuses on the state of knowledge of a particular risk and the process by which we determine how to manage it. This framework is normative; it recommends a path for public managers and interested parties to address risks. It allows managers to consider how to intervene. The IRGC framework assumes that organizational success cannot be codified – it is too complex – but that we can make the process of managing risk more skillful. It interweaves thought and action.

Risk governance can be defined as the totality of actors, rules, conventions, processes and mechanisms concerned with how relevant risk information is collected, analyzed and communicated and how management decisions are taken. The IRGC framework takes into account different schools of thought on risk for an interdisciplinary approach. Renn divides risk governance process into two broad spheres: assessment, which focuses on knowledge generation, and management, which focuses on decisions and action. The assessment phase includes pre-assessment (which captures existing indicators, routines and conventions that may prematurely narrow what is going to be addressed) and risk appraisal (which includes technical risk assessments and determining the level of social concern). Tolerability and acceptability straddle both knowledge generation and management; they determine “appetite” for risk, given likelihood, consequence and the level of residual risk allowable after mitigation measures are put in place. Finally, risk management focuses on the actions required to manage risk to an acceptable level. While Renn shows the process as four discrete and sequential steps, it is not necessarily linear or easily compartmentalized; the process is dynamic and iterative as new data come to light, particularly for risks where there are considerable knowledge gaps.

Risk classification determines which phase of the IRGC framework should be the primary focus for governance of that risk (see Figure 3 on page 14), which management strategy should be employed and which stakeholders should be involved. The IRGC framework divides risks into four classes: simple, complex, uncertain and ambiguous. Its creators later developed the concept of emerging risk. The classification of risk is “not related to the intrinsic characteristics of hazards or risks themselves but to the state and quality of knowledge available about both hazards and risks” (Renn and Walker, 2008, 18).

#### *3.1. Simple and Complex Risks*

With simple risk, predicted events are frequent and the causal chain is obvious (e.g., car accidents). Simple risks generate reliable data that help to inform our view about risk; we can be more confident about the extent to which the threat will materialize and the consequences of that threat. As a result, when policymakers and scientists are considering a simple risk, the discussion is largely instrumental; market failure logic and limiting government intervention (to that which is optimal in market terms) can be a helpful way to develop a regulatory approach.

Complex risks exist when there is difficulty identifying and quantifying causal links between a multitude of potential causal agents and specific observed effects (Renn 2008, 3-17). There are two kinds of complex risks: epistemic, which result from imperfect knowledge, and aleatory, which result from randomness. Epistemic risks include those associated with interconnected infrastructure and for which uncertainty can potentially be reduced through data collection. Aleatory risks include randomness, such as human errors that occur in managing systems; we know that they happen but we cannot know when errors will occur.

Complex risks are examined largely on the basis of expert opinion and formal modelling. Formal models help to explain in rational terms the interactions between many variables; technical risks associated with the power grid, for example, can be described as a complex risk. Regularly occurring natural disasters, such as spring flooding, can also be described as a complex risk. Expert processes can allow us to focus on the existing data, however imperfect, and in so doing, increase transparency and remove the politics and sometimes-petty negotiations. Complex risk problems are the domain of scientists, academics or medics; these professions are trusted more than most (Canadian Pharmacists Association, 2010) and, therefore, the solutions they generate are more likely to be accepted by the community at large.

Formal models, the tools of the experts, have important limitations. From a normative standpoint, formal models embed key assumptions. To start, we assume that complex technological and ecological systems are possible to understand with detailed human comprehension and that a reductionist approach is the best way to understand these systems (Jaeger et al., 2001, 91). Formal models can sometimes completely overlook important social, and even moral, considerations.

While social concern is part of risk appraisal, the analysis of complex risks tends to overemphasize the perspectives of the experts. Lay views are often considered inadequate and ill informed; it is the expert's job to fill the knowledge gaps in the lay views rather than to accept their concerns and anxieties as legitimate. The tools of persuasion can also be suspect. People often have blind faith in numerical analysis and computer models; these processes, however, are subject to bias because information can be manipulated through the manner in which data are presented (Jaeger et al., 2001, 81–2).

Finally, while formal models offer the hope of transparency, rigorous analysis and optimal outcomes, the models fail to include the more subtle dynamics in decision-making, such as strategic reasoning, power plays, interests and institutional responses (Jaeger et al., 2001, 82). In this sense, models offer important insights but do not provide a full account of decision-making. Dietz et al. (1996), for example, note that relatively complex mathematics does not correspond with what we know about human behaviour with respect to decision-making. People are good at pattern recognition, classification and the application of rules of thumb; this undermines the usefulness of the model altogether and frustrates the experts who developed the model with the intention of reducing the influence of seemingly irrational human behaviours. This gap between the scientists and the lay people, including policymakers and

politicians, annoys everyone and threatens to undermine the legitimacy of each group in the other's eyes.

### *3.2. Uncertain, Ambiguous and Emerging Risks*

Uncertain risks exist where there is “a lack of clear scientific or technical basis for decision making,” which “often results from an incomplete or inadequate reduction of complexity in modelling cause-effect chains” (Renn 2008, 18–19). These limitations diminish confidence in traditional objective measures of risk estimation, and therefore risk management becomes more reliant on “fuzzy” or subjective measures of risk estimation (Renn 2008, 18–19). In short, there is an absence of reliable data to inform decision-making. Uncertain risks frequently generate surprises or realizations that risk modelling frameworks fail to anticipate or explain (e.g., rare natural disasters, terrorism, pandemics).

Ambiguous risks result from divergent or contested perspectives on the justification, severity or wider meanings associated with a given threat (Renn 2008, 19). With ambiguous risks, there are two types of ambiguity: interpretative, which stems from different interpretations of the same results (e.g., use of vaccines) and normative, which stems from different beliefs about what risks are tolerable (e.g., nuclear power). For ambiguous risks, broad public consultation is important and solutions are usually provisional until more reliable data become available.

The IRGC has also developed the concept of emerging risk, which it defines as new risks, or familiar risks in a new, unfamiliar context or condition (e.g., global financial markets, infectious diseases). Emerging risks are potentially significant but may not be fully understood and assessed; thus, risk management options cannot be developed with confidence.

As we move from simple and complex risks to uncertain, ambiguous and emerging risks – such as terrorism, rare natural disasters, and infectious diseases – the data become even more unreliable and contested. Figure 3 summarizes the four stages of risk assessment and highlights which stage is most important for a given type of risk. The original IRGC framework did not include emerging risks. This type of risk would have been treated in a similar manner to ambiguous and uncertain risk.

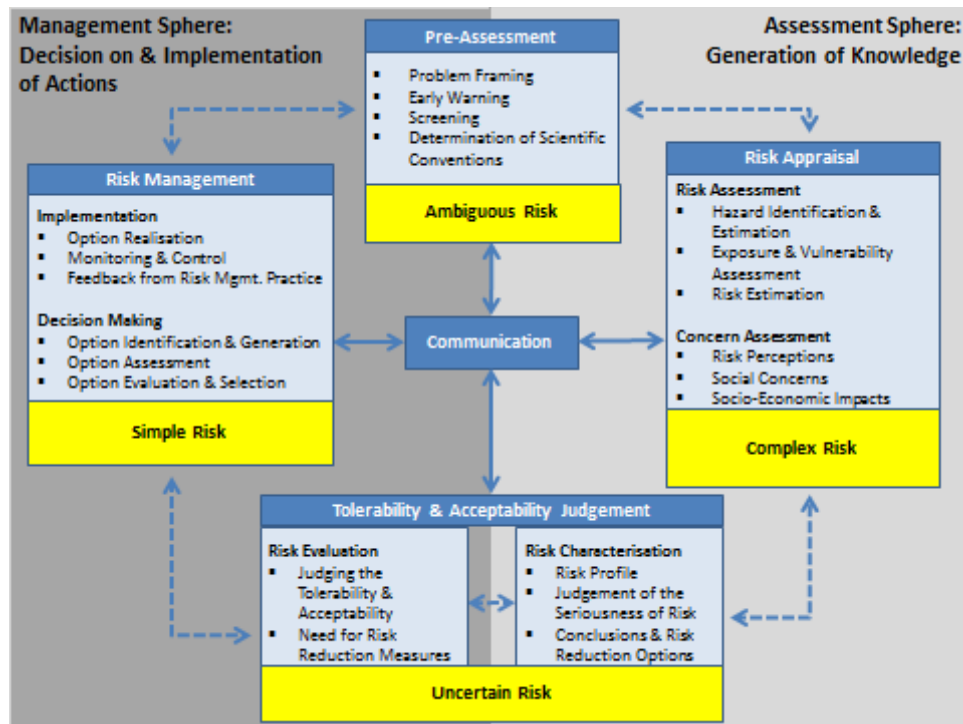


Figure 3: The International Risk Governance (IRGC) Framework (Renn, 2008)

### 3.3. Risk Governance and Scenario Planning

Over the past two decades, numerous risk governance frameworks have been taking a more holistic approach to managing risk by incorporating contributions from several disciplines. These risk governance frameworks go well beyond simple risk calculations by signalling the importance of perception, process and social context. Many of the assumptions about the nature of knowledge and human nature within these academic disciplines are fundamentally at odds. As a result, there will always be tension at the heart of these models. They are roadmaps with signposts, not perfect solutions.

The IRGC framework helps distinguish between types of risk. As a starting point, it is useful to think about our state of knowledge of a particular risk and how this state of knowledge can influence the process and the actors with which we engage. The IRGC framework emphasizes learning and negotiation, particularly with uncertain and ambiguous risks.

As we discuss scenario planning below, note that different risk problems demand different types of scenario planning. We typically have reliable data for simple risks; therefore, trends analysis or approaches that require quantitative data are usually an appropriate approach. As the data become more unreliable, however, our approach to scenario planning will necessarily include more conversational, qualitative and process-oriented approaches with a larger number of stakeholders. Broader stakeholder engagement, however, introduces the challenge of clashing organizational cultures, a point to which we now turn.

## 4. Risk and Organizational Culture

Cultural theory is useful for interpreting how different organizational types respond to risk (Douglas and Wildavsky 1982; Douglas, 1992; Hood, 1998). Cultural theorists see risk as a danger or threat to a value system that is embedded in institutional arrangements, not as a calculable probability. Douglas (2001, 145) notes: “Certainty is only possible because doubt is blocked institutionally: most individual decisions about risk are taken under pressure from institutions.” Douglas describes a person’s value system in terms of the grid/group theory that she developed. Grid measures the strength of rules and social norms and is largely about regulation (Douglas and Wildavsky, 1982, 191–2). Group measures the extent to which community constraints are imposed on an individual and is about integration (1982, 191–2).

Grid/group theory measures regulation (grid) and social integration (group) to determine value systems and the preferred institutional arrangements flowing from them, leading to the characterization of four cultural types: hierarchists, individualists, egalitarians and fatalists. Each type has a preferred governance arrangement and particular blind spots and vulnerabilities.

When tested empirically, cultural theory has had mixed success (for examples, see Dake, 1991; Brenot et al., 1998; Sjöberg, 1998). Dake and Brenot et al. both found that correlations between culture and bias are weak and of limited predictive value. Olstedal and Rundmo (2007) studied cultural theory and risk perception in the transportation sector and found different risk perceptions among different groups. Grid/group theory has also been criticized on the grounds that the categories in the typology are too limiting. Risk perceptions are far more complex and dynamic than the categories imply (Renn et al., 1992) and cultural theory fails to take the media into account (Zinn, 2006, 282). At the same time, cultural theory’s capacity to show the recurring debates and irreconcilable difference in these debates has been described as a revolutionary advance in the study of risk (Royal Society, 1992); Hood’s (1998) use of the theory to explore the recurring debates about how to govern and arrange public services is a particularly recognized study.

Like Hood, we use Douglas’s conception of cultural theory as a heuristic device to structure an analysis of risk regulation regimes in different sectors. No organization fulfills all the requirements of any one of the four cultural types. Rather, organizations show tendencies, and these tendencies can be particularly strong in the aftermath of a failure. Knowing this helps one to anticipate who or what an organization will blame when things go wrong and the pressures and demands each sector is likely to make on the regulatory regime.

### *4.1. Hierarchist: Command and Control*

Hierarchists fit comfortably into a bureaucratic framework: control is assumed to reside at the top of the organization and those in the organization follow the commands of those at the top.



According to cultural theory, hierarchists understand good governance to mean a stable and predictable environment (Hood, 1998, 75). On the positive side, a small number of large organizations – which is typical in hierarchical arrangements – can be easier to organize than a large number of small organizations. Because of their size, hierarchical organizations are also the most similar to government bureaucracies and are therefore conducive to the formation of a stable relationship between these organizations and government regulators. Their considerable resources allow them to secure expertise when required. Generally, these sectors are likely to enjoy stable, trusting and collegial relationships with government regulators, which can facilitate consensus on risk management priorities for the sectors (Vogel, 1986).

Hierarchists have a highly optimistic view of management; when things go wrong, they generate more standards, recruit experts and engage in formal strategic processes (Hood, 1998, 53). To the hierarchist, “leadership at all levels” is rhetorical speech-play; authority lies at the top and filters down from there. At each level of the hierarchy, “responsibility for specific tasks” is a more appropriate way to describe the organization. Such sectors have corporatist tendencies; they can be loath to accept dramatic change unless all interests believe it is warranted or there is a profound external shock to the system. These hierarchical organizations are not known for their flexibility. When things go wrong, hierarchists blame lack of expertise and strategic thinking. Hierarchist organizations can overregulate their staff – whom they can tend to dehumanize in their practices – and in so doing diminish adaptive or innovative behaviour. There is also an assumption that leaders are working in the best interests of the organization, which is not always the case. Because larger industry players dominate their sectors, rules are developed with them in mind. Smaller industry players are too often regulated in the same manner as the larger industry players; nuance is not the strong suit of hierarchist organizations.

#### *4.2. Individualist: Competitive Context*

Small and medium-sized enterprises (SMEs) in general are best described as individualist organizations. SMEs are more sensitive than larger enterprises to market conditions, price signals and customer needs.

The individualist understands good governance to mean minimal rules and interference with free market processes. Individualists believe that people are self-seeking, rational and calculating opportunists. Individual responsibility rules supreme and apathy means consent (Thompson et al., 1990, 34, 65). In contrast, individualists perceive government regulation of the economy as a threat. For this organizational type, competition is natural. Individualists are not motivated by the public interest. SMEs are highly atomistic; they are less likely to build up redundancies but can be responsive provided their private interests are also served and they possess sufficient capacity to serve the public’s needs. Unlike large organizations, SMEs can easily go out of business with little disruption to the sector or the economy. As a result, SMEs are more responsive and adaptive; at the firm level, they are also more disposable.

Despite the individualist's faith in market practices, individualist practices such as pay-for-performance can undermine collective goals and lead to competition, not cooperation. At the same time, because SMEs are less well organized than larger organizations, they are less likely to lobby effectively, which means standards are easier for government to impose but consultation and reliable information gathering are harder to conduct. SMEs are also more immediately sensitive to price signals than larger organizations. While this means that appropriate incentives can drive desired behaviours, it also means that SMEs are more sensitive to cost increases. There are a vast number of SMEs working in a competitive context with little direct oversight, which makes it difficult to capture those breaking the law for private gain.

### *4.3. Egalitarian: Community Effort*

Non-competitive industries tend towards egalitarianism. There is a strong sense of team or community in non-competitive industries. People in the same fields share similar technical training, which ostensibly suggests higher regulation but can also be a way to distinguish who is "in" the club and who is "out". The training also comes with symbols, such as uniforms, which further reinforce a team identity. Many rules and cultural norms are inaccessible to outsiders but the members know when these rules and norms have been broken. In contrast to other organizational types, many egalitarian organizations are disinclined to spend their time expanding contacts outside the community and more inclined to spend their time working within their community.

The egalitarian understands good governance to mean local, communitarian and participative organizations. For egalitarians, authority resides with the collective. Moreover, egalitarian organizations are flat, or at least there is minimal difference between top officials and the rank-and-file. Small and medium-sized NGOs are often characterized as egalitarian.

Egalitarian organizations are keenly aware of the important role they play in supporting their communities. Notwithstanding this awareness, cultural theory suggests that egalitarian organizations would tend to be inwardly accountable to their team and to their profession. They can be suspicious of "outsiders." There is a high level of commitment to the team and its mission. In such communities, organizations do not necessarily resist information gathering, standard setting and behaviour modification but it is important who delivers messages and how messages are delivered. Egalitarians are much more likely to learn and adapt on the basis of lessons from specialists in their own subsector. The team thinking prevalent in egalitarian communities can sometimes get in the way of innovation and making new connections beyond their immediate network. Egalitarians can be good at generating ideas but bad at making decisions. Egalitarian approaches can lead to middle-of-the-road consensus-seeking behaviour as opposed to risk-seeking behaviour. Changes can be slow and rules are often informal (and not always apparent to outsiders). If organized on too large a scale, egalitarian organizations are susceptible to breakdowns and fracturing.

#### 4.4. Fatalist: Conflicting Priorities

Fatalist forms of governance are random, which undermines incentives to build strong teams. Unlike hierarchist organizations, which are optimistic about management potential, fatalist organizations are skeptical. Fatalists question the accuracy of information, doubt many of the standards and recognize that their behaviour must change as the wind blows. Of all the organizational types, fatalist organizations are least likely to plan for a hypothetical event. They doubt that their overseers will support them. Fatalist organizations operate in a low-trust environment.

Fatalism is the least studied of the four types but offers potentially powerful insights into current challenges. As we see a rise in nationalism and a drop in multilateralism on the world stage, models of governance that are underpinned by low trust and high skepticism provide us with some concepts to anchor a discussion in the current context. The model would lead policymakers to consider forms of resilience and adaptive capacity.

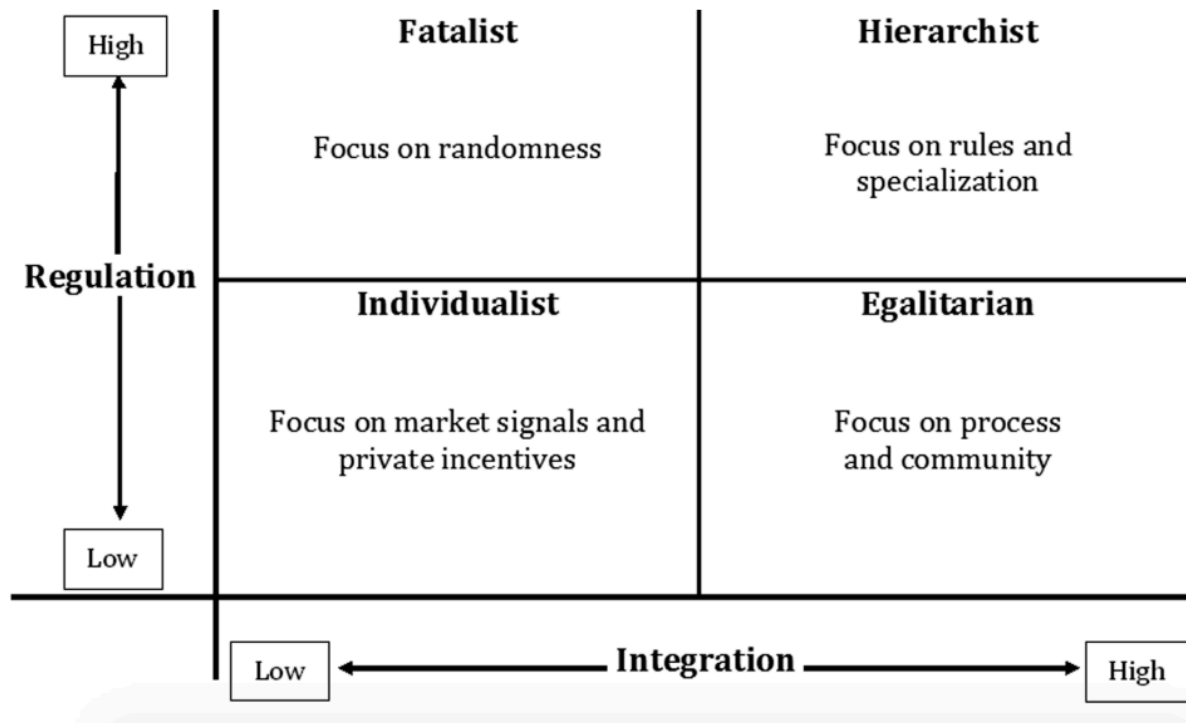


Figure 4: Summary of our Description of the Four Organizational Types

#### *4.5. Cultural Theory and Scenario Planning*

A cultural theory analysis helps us distinguish between the organizational types and, in so doing, identify strengths, weaknesses and blind spots in the governance of different organizations and sectors. Hierarchists, for example, prize stability but they are much less successful at adaptive capacity and innovation. To be innovative, a hierarchist would have to partner with individualist organizations. The hierarchist would also have to resist the temptation to over-regulate the individualist organization lest it compromise the flexibility the individualist needs to be innovative. We see this sometimes when government agencies over-regulate the private sector entity they have contracted to provide a service to the public.

Egalitarians also struggle with innovation; large groups organized in an egalitarian manner are good at generating ideas but bad at making decisions and moving forward. Egalitarian groups build consensus, which is not generally associated with innovation or entrepreneurialism but rather middle-ground compromise.

Fatalists struggle with planning because they feel they have little control over their destiny. This dynamic should encourage them to consider ways to become more resilient.

Cultural theory helps us to see that during scenario exercises, there will be tensions at the heart of the process. While there is a high degree of interdependence among government agencies, not-for-profits and the private sector, the organizational design of many sectors is quite different, which makes coordination, cooperation and accountability more difficult to achieve. Cultural theory also suggests that when things go wrong, the tenuous relationships that organizations have in place to facilitate coordination will probably fall apart or at least be strained and tested. This tendency would undermine any attempt to have ambitious, coherent, multi-organizational strategies, particularly if the organizations are different cultural types.

## 5. Scenario Planning and Strategic Conversations

### 5.1. *Why Scenario Planning? The Future is Uncertain*

18<sup>th</sup> century philosopher David Hume famously noted in 1772 that though the sun has risen every day in human history, there is a possibility that it may not rise again tomorrow. A certain level of uncertainty exists with every prediction, however slight the uncertainty may be. When it comes to planning for businesses and organizations, there is an art to determining which things we believe that we know, and which elements we consider uncertain or unknowable (Schoemaker, 1995). Despite Hume’s skepticism, it is quite safe to assume that the sun will rise again tomorrow, but there are many other factors that are less certain, and others that we take as certain that may not be so.

For many aspects of futures planning, prediction based on previous trends is a useful and necessary tool to remain competitive and inform decisions. Simple risks are great examples of cases where prediction is reliable. If insurance companies want to determine how many car crashes will occur in Halifax in 2020, they would use previous trends data to make a prediction. Van Asselt et al. (2010) label this process forecasting, a technique that relies on trend extrapolation and time point estimates. Forecasting uses large amounts of past quantitative data to attempt to predict accurately the most likely singular future. But how can an organization anticipate events that do not follow a trend? What should an organization do when the future is more uncertain and a variety of dimensions intersect to create an outcome that is almost impossible to predict?

Courtney et al. (1997) suggest ranking future uncertainty across four levels to determine the correct methodology for futures planning. A “level one uncertainty” is a clear-enough future that can reasonably rely on forecasting and trend mapping using existing data. “Level three and four uncertainties” are cases that involve a range of possible outcomes or no basis to forecast the future. These situations require more than just forecasting. In these cases, scenario planning is most often employed as prediction is impossible and the future takes place in an uncertain turbulent environment (Ramirez and Wilkinson, 2014).

The Economic Policy Uncertainty Index, a metric run by economists at Northwestern, Stanford and the University of Chicago, measures level of policy uncertainty in the world’s major economies. Despite the index having Canadian data from 1985 to the present, the three most uncertain points for Canada’s economic policy have fallen between November 2016 and June 2018 (Baker et al., 2018). Some speculate that trends in existence for decades are being disrupted. The North American Free Trade Agreement (NAFTA, now USMCA) was abruptly renegotiated after 20 years, Canada’s military spending (NATO) has come under increased pressure from the United States, and the Canada–U.S. Safe Third Country Agreement is now

subject to increased scrutiny. Changes to these and other policies could have cascading effects on Canada's defence budget, security, trade levels and immigration levels.

In light of some of these uncertainties for Atlantic Canada, scenario planning is a tool that can challenge us to think differently and invite us to examine alternative outcomes. A scenario is not a prediction of the future but rather a hypothetical sequence of events that is helpful in investigating causes and necessary decision points (Van Asselt et al., 2010). Scenario planning goes beyond the usual strategic focus and can serve as a mental model to understand complex systems with various actors (Ringland, 2010). Suggestions for how ACOA should use the scenario planning model and examples of cases where it may be relevant are addressed in the following sections.

## *5.2. What is Scenario Planning?*

Schoemaker (1993) hypothesizes that there are three criteria present in all forms of scenario planning: (1) it is narrative focussed, (2) uncertainty is set across, rather than within, models and (3) it sets out multiple outcomes that can be compared. Outside of these three similarities, scenario planning practices can vary widely. There are widespread, overlapping and at times completely different definitions of the practice, and Khakee (1991, 52) claims that "few techniques in futures studies have given rise to so much confusion as scenarios." The variety in methods of scenario planning is due to its long and diverse history.

The first use of modern scenario planning is attributed to Herman Kahn, a military strategist at the RAND Corporation (Bradfield et al., 2005). Working on the U.S. Air Defense System Missile Command, Kahn challenged the organization to alter its vision of the future and to 'think about the unthinkable'. He proposed using scenarios to posit alternatives to annihilation or surrender in the event of nuclear war.

In 1961 Kahn started the Hudson Institute that works to apply scenario planning to civilian initiatives including public policy and social forecasting. The Institute still exists and Kahn's scenario planning style is often referred to as being the basis for the intuitive logics school of scenario planning.

In 1969, Pierre Wack, an executive at the French branch of Royal Dutch Shell, began to build on Kahn's scenario ideas but tailor them to the business sector. Scenarios developed at Shell in the early 1970s are credited with providing the oil company with the foresight to weather the 1973 oil crisis (Wilkinson and Kupers, 2013). Since then, Shell has established a permanent scenario planning department where leading scenario thinkers have come up the ranks including Kees van der Heijden, Peter Schwartz, Paul Schoemaker and others.

During the 1950s, when Kahn was working with the RAND Corporation to develop his version of scenario planning, Gaston Berger established the Centre for Prospective Studies in France. *La*

*Prospective* version of scenario planning grew out of what Berger recognized as the failures in traditional futures forecasting. French futurologists Pierre Masse, Bertrand de Jouvenel and Michel Godet further developed Berger's work to create a "more elaborate, complex and more mechanistic" version of scenario planning than the 1960s Hudson Institute method (Bradfield et al., 2005, 283). This method is still referred to as *La Prospective* or 'The French School' of futures planning.

The use of scenario planning has seen rises and falls since its inception in the 1960s. There was a surge in the 1970s with high-profile reports like the Club of Rome's 1972 *Limits to Growth*, and Mesarovic and Pestel's 1974 *Mankind at the Turning Point*. In the mid-eighties there was a decline in the practice but shortly after September 11, 2001, scenario planning rose in prominence again (Ramirez et al., 2008). There is evidence that scenario planning goes in waves and rises in times of considerable uncertainty (Bradfield et al., 2005).

Coates (2016, 116) foresees scenario planning continuing to grow in popularity as the world becomes more complex. The increasingly interconnected nature of business globally and a "long and growing list of large and unanticipated events, crises, wars, etc." have in turn created a more turbulent future and a need for a more adaptive and foresight-oriented response (Ramirez et al., 2008).

### *5.3. Scenario Planning Types and Strategies*

Given the uneven history of scenario planning and the variety of methods employed by futurologists, there is no universally accepted, singular, established method for creating scenarios. Some practices, like the 2 x 2 matrix (discussed in section 6.2), are more common than others, but the field of scenario planning can succumb to what Martelli (2001) calls "methodological chaos".

The design of the scenario planning process is dependent on a variety of factors and can be structured through three key themes (Van Notten et al., 2003). The first distinguishes the intent of the exercise (exploration vs. decision support), the second is based on the level of quantitative data and expertise involved (formal vs. intuitive) and third determines the number of individual factors considered (simple vs. complex).

#### *Project Goal: Exploration vs. Decision Support*

The first theme in Van Notten et al.'s (2003) model centres on the project goal. Why is the futurologist conducting the scenario planning session? Projects that aim to stimulate creative thinking, examine causal factors and raise awareness about unforeseen issues fall under the **exploration** category.

When the futurologist is looking to make a key decision on implementing a specific policy, a **decision support** route is necessary. This route is used to "examine paths to futures that vary

according to their desirability” and can propose concrete decision options (Van Notten et al, 2003, 426).

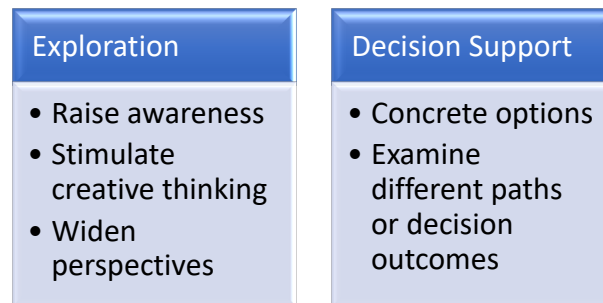


Figure 5: Exploration vs. Decision Support

*Process Design: Intuitive vs. Formal*

After establishing the project goal, the futurologist then selects the process design. The **formal** process is defined as an intensely analytical approach based on comprehensive quantitative data sets and is often associated with the French *La Prospective* school of scenario planning (discussed further in section 6.1). Formal processes often rely on computer models and simulations and can emerge from trend mapping data. These sessions often involve a small select group of experts and futurologists.

The **intuitive** approach favoured by former Royal Dutch Shell Scenario Chiefs Kees van der Heijden and Peter Schwartz focuses on qualitative data and stakeholder engagement. Van der Heijden advocates “strategic conversation” planning sessions where a wide variety of stakeholders meet with a goal of understanding what causes change (Van der Heijden, 1996).

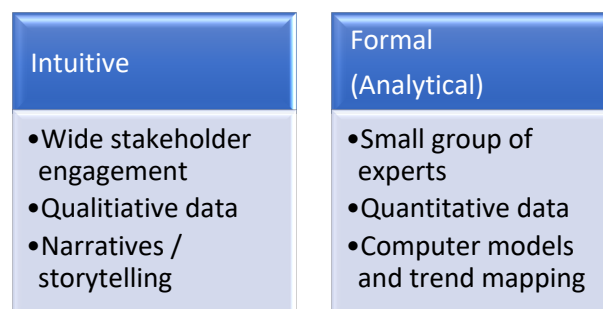


Figure 6: Intuitive vs. Formal (Analytical)

*Scenario Content: Complex vs. Simple*

The content of the scenario planning session is defined by the scope of the project. A **complex** scenario planning exercise will include a tangled web of problems across numerous disciplines that involve a wide variety of actors operating on multiple scales. Complex scenarios construct a hypothetical future where the decision-making context is important and includes all necessary factors and agents.



On the other hand, a **simple** scenario planning exercise offers the ability to zoom in on one potential problem. Simple scenarios aim to address only the factors surrounding that one problem and, in some cases, use a trend extrapolation method to define the context around that problem.

Simple	Complex
<ul style="list-style-type: none"> <li>•One or two problems</li> <li>•Only direct factors considered</li> <li>•No context setting or extrapolated trends for context</li> </ul>	<ul style="list-style-type: none"> <li>•Wide scope of problems</li> <li>•Across numerous disciplines</li> <li>•Lots of thought into context setting</li> </ul>

Figure 7: Simple vs. Complex

*The Scenario Cartwheel*

The three themes presented above result in eight potential scenario planning exercise models mapped out in Van Notten et al.'s (2003) scenario cartwheel (Figure 8).

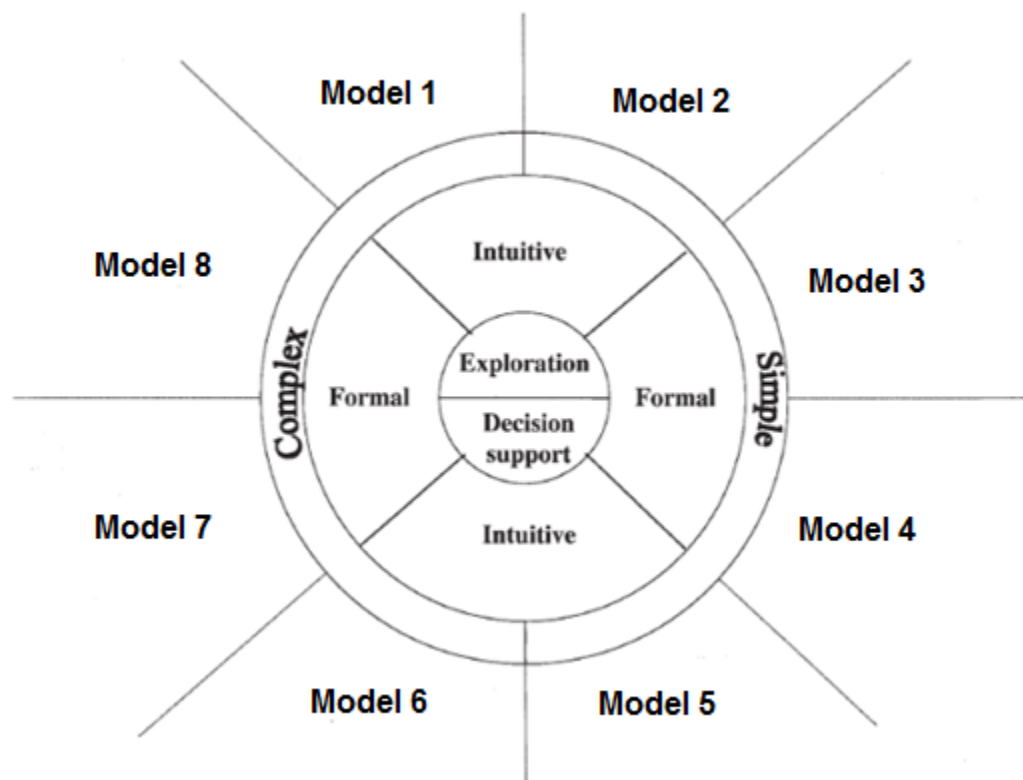


Figure 8: Adapted from Van Notten et al. (2003), "The Scenario Cartwheel"

The structure of scenario planning exercises, whether intentional or not, can be classified in one of the above eight boxes. Van Asselt et al. (2010) observed 22 scenario planning sessions that

took place over four years at policy-oriented institutions and agencies in the Netherlands. The cross-section resulted in examples of all eight types of scenario planning models. For the most beneficial outcomes when planning a scenario session, the methodology and structure should be the result of categorizing the process into one of the eight models in Figure 8.

#### *5.4. Scenario Planning Outcomes*

A public agency can approach a scenario planning exercise by starting with the themes section above and answering the following questions.

- Does the agency need assistance in specific cases and decision-making challenges (decision support) or does it want to broaden its thinking about possible uncertainties (exploration)?
- Does the agency have a large quantitative data set and trends mapping models on which it would like to base its decisions (analytical) or would it like the assistance of stakeholder engagement across the organization to build qualitative narratives (intuitive)?
- Does the agency want to solve one specific problem (simple) or is it looking to address a wide variety of problems and factors across disciplines (complex)?

Based on these decisions, the goals, process, content and outcomes can be very different. In section 6 we outline how to construct the intuitive logic models. We also explore the contextual drivers for ACOA and provide a step-by-step process for an intuitive scenario planning session as a tool for ACOA's future reference (section 7).

## **6. Policy Development and an Uncertain Future**

### *6.1. Constructing Scenarios (Three Approaches)*

By using the scenario cartwheel pictured in Figure 8, a scenario planner will determine which of the eight models to follow. The eight models can be categorized into the three schools of scenario planning (Bradfield et al., 2005).

- A. The intuitive logics school (plausibility based),
- B. The probabilistic modified trends school (PMT; probability based).
- C. *La Prospective* school (preference based)

### *The Intuitive Logics School*

The Intuitive logics school, often associated with Royal Dutch Shell, is the most commonly used method for scenario planning (Bradfield et al., 2005). It is process-focussed and less outcome-focussed, with an emphasis on making all scenarios equally plausible (Ramirez and Wilkinson, 2014).

Kees van der Heijden is considered a leading thinker in the intuitive logics field of scenario planning, and was instrumental in developing scenario planning tools and techniques at Shell. He notes, “This is the purpose of scenario work. Think in terms of asking the why question, trying to find the causes of the causes of the causes” (Van der Heijden, 1996). Van der Heijden emphasizes that scenario-based planning in its most developed form is about understanding what causes change.

To create foresight in a highly uncertain environment, Van der Heijden has developed the concept of “strategic conversation,” which envelops intuitive logics scenario planning. His research focuses on institutional strategic thinking and learning, and on processes for intervention in these areas. “An effective strategic conversation must incorporate a wide-range of initially unstructured thoughts and views, and out of this create shared interpretations of the world in which the majority of the individual insights can find a logical place. And it is only through such embedding that joint action can result leading to new joint experiences and reinforcement of the shared theories-in-use” (Van der Heijden, 1996). He notes, “We will consider strategy inventions and development as part of a wider integrated mental activity of which perception and real world action are also fundamental parts. Strategizing along this definition is portrayed as a loop, i.e., it is never finished. Reality is always different from expectation and behaviour therefore always needs to be adjusted” (Van der Heijden, 1996).

By engaging in widespread stakeholder engagement– Van der Heijden’s successor Jaworski conducted 3+ hour interviews with over 100 Shell executives in his first year – the intuitive logics school aims to “surface the biases inherited from past or existent cultures and institutional norms and preferences in preparing options for choice in decision making” (Ramirez and Wilkinson, 2014, 7). It can help to develop an increased capacity for organizational learning, and perceiving and responding to change.

### *Probabilistic Modified Trends School*

On the other end of the scenario-planning spectrum is the probabilistic modified trends (PMT) school. The PMT model is an advance on traditional trends mapping as it uses past data to extrapolate potential futures (Bradfield et al., 2005). PMT differs from traditional trends modelling in that it incorporates the potential for unprecedented future events. A significant difference between PMT and intuitive logics is the PMT model’s reliance on assigning probabilities. Potential unprecedented future events are given probability rankings and they result in multiple futures with varying impacts. A cross-impact analysis can be used to mathematically incorporate the impact and interdependence of a variety of factors and agents.

### *La Prospective School*

Developed by French scholars Gaston Berger and Michel Godet, *La Prospective* school has a strong reliance on mathematical and computer-based probabilities (Bradfield et al., 2005). *La Prospective* is similar to PMT in its focus on outcomes, data collection and trend extrapolation, and it assigns probabilities to each scenario. This method differs from PMT in that it leaves room for intuitive logics-style discussion and consultation. The Godet style of the prospective school follows similar “standard” steps to the intuitive logics school but uses computer programs to answer questions of key variables and probabilities. This school plays an important role in French public sector planning and can be viewed as a combination between the PMT school and the intuitive logics school.

Ron Bradfield, George Wright, George Burta, George Cairns, and Kees van der Heijden developed a detailed chart outlining the similarities and differences of the three schools, found in Appendix A.

### *6.2. Intuitive Logics and the 2 x 2 Matrix*

Van Asselt et al. (2010) represent an advance on Van der Heijden (1996), extending the intuitive method of scenario planning into the policy realm.

Though not used in all cases, the 2 x 2 matrix is often referred to as the “standard” tool in intuitive logics scenario planning (Van Asselt et al., 2010; Ringland, 2002; Ramirez and Wilkinson, 2014). This matrix consists of four boxes that are used to plot scenarios and two axes that often represent driving forces. Like most aspects of intuitive logics scenario planning, the 2 x 2 matrix can be used differently depending on the circumstance. Van Asselt et al. (2010) outlined four different uses for the 2 x 2 matrix.

#### *2 x 2 Matrix as Backbone*

The conventional structure of an intuitive logics scenario planning exercise while using the 2 x 2 matrix is referred to as the backbone. The backbone matrix is built by:

- a. Identifying and explaining key contextual drivers for the organization. In the backbone model these are the two factors that score the highest with regards to impact and uncertainty. They serve as the axes for the matrix.
- b. Develop different scenarios based on the organization’s key drivers. Each of the 4 possible scenarios is plotted out in the 2 x 2 matrix.
- c. Identify policy and program characteristics that are suited to the scenarios that they generate.

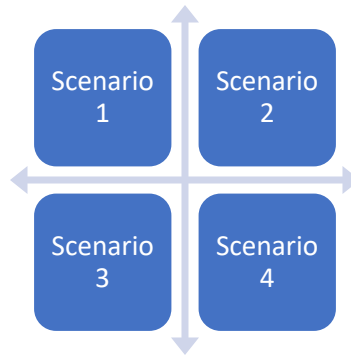


Figure 9: Matrix as Backbone

### *2 x 2 Matrix as Foundation*

Many futurologists see the scenario matrix as a more process-oriented device, one that is socially constructed and thus must remain flexible. In the foundation model, the matrix's axes are not required to be the main contextual drivers for the organization. The matrix serves as a foundation to the process of foresight and allows for flexibility in selecting the axes and developing the scenarios in each quadrant (Van Asselt et al., 2010). It is used as a framework that scenarios can be built around. Like the scenario matrix as backbone, the scenarios are limited to one per quadrant but are represented as a point along the axes' 2D possibility space.

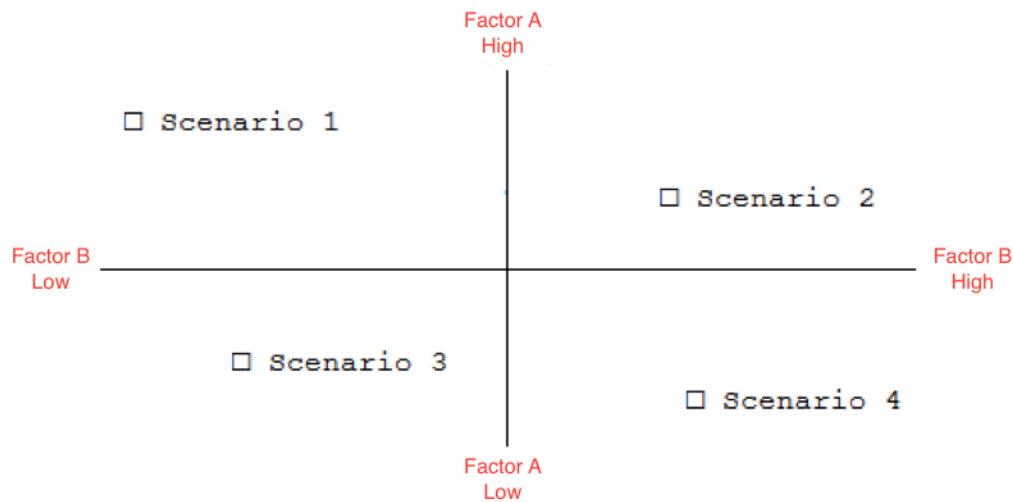


Figure 10: Matrix as Foundation

### *2 x 2 Matrix as Scaffold*

In some cases, the matrix is not used for the entirety of the process. The scaffold approach to the 2 x 2 matrix sets up the grid as a guideline to begin the scenario planning process. It is put in place to guarantee that the scenarios “diverge sufficiently” and then is abandoned to remove any further structuring on the process (Van Asselt et al., 2010). Royal Dutch Shell has not included the matrix in their final reports in over 15 years but it is possible that the scaffolding

exists in the early stages and is removed before the scenarios are made public (Ramirez and Wilkinson, 2014).

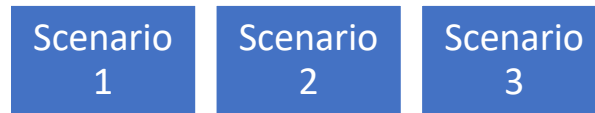


Figure 11: Matrix as Scaffold

*2 x 2 Matrix as Showcase*

The showcase matrix serves as a communication tool and is not brought in until the end of the process. It is used as a “presentation format that positions scenarios in a 2D possibility space” (Ramirez and Wilkinson, 2014, 12). In this model, scenarios are not limited to one per quadrant but rather are plotted across the matrix to compare their positions in relation to the driving forces represented by the axes.

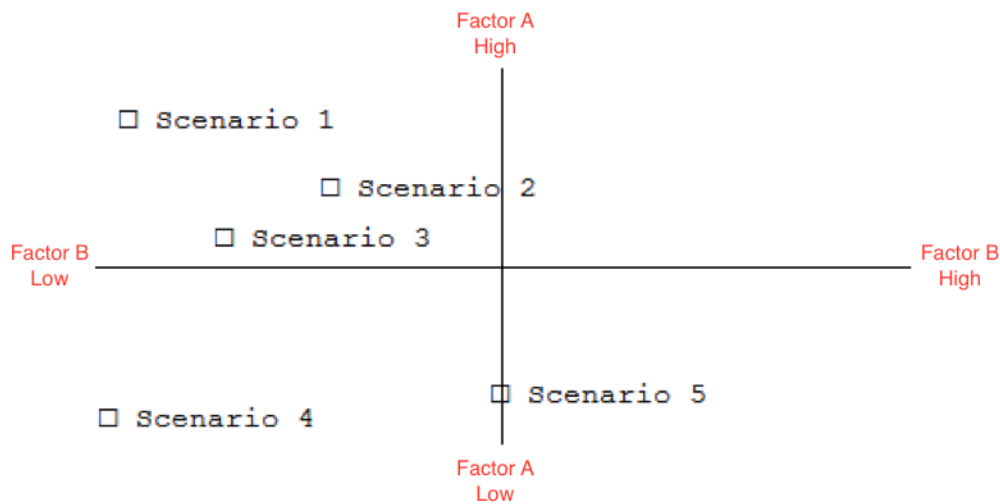


Figure 12: Matrix as Showcase

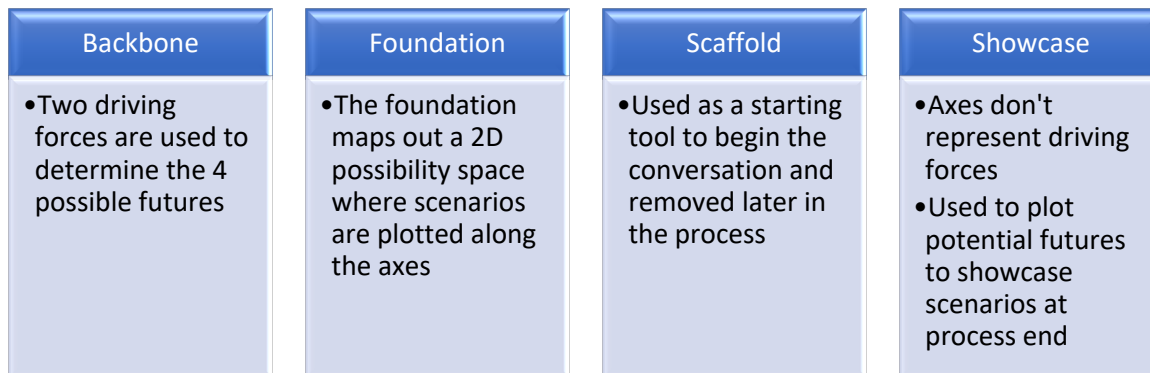


Figure 13: Overview of Matrix Types

### 6.3. Limits of Scenario Planning

There are limitations. The first and most important is that scenario planning is best employed under a specific circumstance – a very uncertain future. The process aims not to predict but to understand the complexity and factors involved and identify causes and necessary decision points.

One of the central criticisms of scenario planning is the lack of standardized methodology in practice; there are multiple viewpoints, schools and methodologies. Consecutive chief planners at Shell have restructured the methods multiple times. Practices for scenario planning vary between former Shell planners. As Bradfield et al. (2013, 800) note, “there are almost as many ways of developing scenarios as there are practitioners in the field.” In *The Art of Scenarios*, Godet (1999) expresses concerns that inexperienced planners stray too far from established formalized approaches, being selective across methodologies. This paper has addressed the variety of methods and seeks to follow one of the most common practices, the intuitive logics school.

Ramirez and Wilkinson (2014) published a criticism of the 2 x 2 matrix, stating that for some situations it is overly simplistic. There are certain contexts when fewer than four scenarios are needed. These situations arise when the 2 x 2 matrix does not offer four equally plausible scenarios (Van Notten et al. 2003; Van der Heijden, 1996).

Van Asselt et al. (2010) dedicate a chapter to the challenges associated with incorporating political policy into scenarios. Futurologists, in an attempt to remain apolitical, did not forecast potential policy decisions by future governments. This common occurrence and attempt at objectivity led to scenario planning sessions that omitted important factors and had blind spots as they related to political decisions. Van Asselt et al. conclude that omitting potential policy decisions by future governments is “unattainable and undesirable.” The authors highlight prediction of future political decisions as one of the key differentiators between business-oriented foresight and policy-oriented foresight.

## 7. ACOA: Contextual Drivers and Possible Futures

The Atlantic Canada Opportunities Agency (ACOA) defines its role as creating opportunities for economic growth in Atlantic Canada by helping businesses become more competitive, innovative and productive, by working with diverse communities to develop and diversify local economies and by championing the strengths of Atlantic Canada. It has three central programs:

- **Enterprise development** – helping improve the business climate and lending a hand for individual business startups, modernizations and expansions.
- **Community development** – working with communities to nurture economic growth, improve local infrastructure and develop opportunities in the local economy.
- **Policy, advocacy and co-ordination** – being a champion for Atlantic Canada by representing the region’s interests at the national level in areas like policy development, research and analysis and in work with other departments to ensure coordination of policies and programs.

A central tenet of the federal government’s and ACOA’s approach to the region is captured in the Atlantic Growth Strategy, aimed at driving sustainable economic growth. The Atlantic Growth Strategy has five strategic goals:

- Attract and retain a skilled workforce
- Foster greater business innovation, drive leading-edge technology, and generate new breakthrough ideas
- Respond to climate change and advance clean growth technology
- Create long-term growth and high-quality jobs through trade, investment and tourism
- Support growth, engage and connect people through infrastructure

The strategy is a positive statement that charts a way forward for the agency and the region more generally. At the same time, it is also an expression of risk. The five thrusts of the Strategy highlight threats that exist for the region, particularly in retaining an appropriate workforce and sustaining a high quality of life.

ACOA’s departmental business plan 2017–18 identifies two key risks: economic context and external capacity. This section of the paper defines and summarizes these concepts, and a number of contextual pressures that influence the region, and considers how these concepts could be employed in a scenarios exercise.

It is important to select contextual issues that affect the agencies involved in the scenarios exercise but over which the agencies themselves have little direct control (e.g., the value of the



U.S. dollar). The exercise is to determine how the agencies can respond to the future scenarios, not control them. The exercise must be outward-facing in this sense.

### *7.1. Brief Statement of Context: Elaborating on Key Concepts*

#### *Economic Context and External Capacity*

**Economic Context** “There is a risk that the achievement of results expected from the Agency’s economic development programming may be affected by external factors that contribute to uncertainties for economic growth in Atlantic Canada” (ACOA 2017–18, 9).

The Atlantic Growth Strategy pursues a number of initiatives to enhance the economic context, including increasing trade and investment opportunities, improving infrastructure, encouraging innovation and pro-active stances on managing risks associated with climate change.

**External Capacity** “There is a risk that partner, community and client capacity for the identification, development and successful implementation of strategic projects may not be sufficient to support the optimal achievement of ACOA’s program objectives” (ACOA 2017–18, 9).

The Atlantic Growth Strategy is pursuing a number of initiatives to enhance external capacity, focussing in particular on developing a more skilled workforce, attracting more immigrants, improving infrastructure and increasing the region’s capacity for innovation.

The operating context of the 2017–2018 departmental plan provides a useful summary of key drivers for the region. See Appendix B for the full text.

We provide some further thoughts here. The discussion is not meant to be exhaustive but taken together with the Operating Context, it highlights that there are several driving forces that could be usefully deployed to develop matrices in scenarios exercises.

#### **External Capacity**

The Atlantic region has an aging population and one that is increasingly urban. It has had limited success in attracting and retaining immigrants and residents from other provinces. The region has also had difficulty attracting foreign direct investment (FDI). Studies suggest that the small size, low urbanization and peripheral location of the Atlantic Provinces do not encourage FDI in the region. There have been government and industry investments in technology and oceans sectors, for example. There are also new infrastructure investments, largely in urban areas. Rural infrastructure is costly. The region has a highly developed post-secondary environment. Residents have high expectations of public service generally; health care costs, in particular, are high and expected to grow. The public sector is a significant employer in the region but employment outside health care is expected to contract. Infrastructure investments

are likely to become more available in the near future. In certain regions, infrastructure investments suffer from being ad hoc and bottom up; at times, they can lack a strategic vision that enables a desired future.

## **Economic Context**

There are several important economic concerns. There is increased anxiety about the economy generally. The IMF projects a decrease in growth rate for Canada, for example. Many Canadians are concerned about the state of the economy: only 34% of Canadians believe they will be better off in five years' time (Edelman, 2019). The cost and prevalence of environmental disasters is generally on the rise. There is also a high level of distrust among the public for public-private partnerships that may constrain infrastructure investments.

The international trade environment is highly fluid and a particularly salient topic. Multilateralism, which has created a stable international trading system in which Canada has generally benefited, is at risk of being replaced by unilateralism and bi-national trade agreements. As a trading economy, the Atlantic region must engage in this fluid context. Exports from Atlantic Canada in 2017 were valued at \$19.5 billion (ACOA, 2018). Access to the U.S. market is the single most significant opportunity and threat. The U.S. market continues to be the trading partner that receives the most goods and services from Atlantic Canada, and by a good margin. The U.S. economy continues to perform well since its recovery from the financial crisis of 2007–08. Nevertheless, uncertainty in U.S. trade has increased in light of increased nationalism and populism, the introduction of steel tariffs, the lack of a softwood lumber agreement and the current renegotiation of NAFTA (now USMCA, awaiting Congressional approval). Traditionally, efforts to expand trade opportunities for Canadian products beyond the U.S. have met with some success but there is little doubt that economic performance in the region depends significantly on access to a strong U.S. market.

There are other concerns. Canada has entered into new agreements with the European Union and the Pacific Region, which creates opportunity. Europe, however, also includes increased uncertainty with the rise of nationalism and populism, and Britain's exit from the EU. There is also rising concern about environmental standards, particularly in the EU and U.S. markets, which can increase costs and trade barriers in the future. Finally, trade with China has become ever more important to Atlantic Canada, particularly with respect to seafood and international students in Nova Scotia. Diplomatic relations with the Chinese government have become constrained in light of the requested extradition of Huawei executive Meng Wanzhou to the U.S. and an increasingly confrontational relationship between the U.S. and China, in which Canada is arguably caught in the middle. China is Atlantic Canada's fastest growing trade partner.

## 7.2. How to Structure the Exercise: Qualitative, Narrative, High-Level, Process-Oriented

As discussed earlier, the structure of the scenario planning exercise is dependent on the policy focus, level and availability of data and stakeholder participation. Here we illustrate using the most common form of scenario planning, the intuitive logics method using the scenario matrix as a backbone.

### *Selected Contextual Drivers for the Backbone*

There are a number of drivers one might adopt to structure the session. The drivers can be concepts that are relevant to and derived from the key goals of the Atlantic Growth Strategy and the associated risks and uncertainties.

For the variable *economic context*, we could select key concepts that are germane to specific initiatives in the Atlantic Growth Strategy, such as variables associated with immigration and trade and investment, as drivers for the session. These are high-level concepts that can be used to guide the discussion. Equally, one could be more specific and discuss, for example, the future of NAFTA (USMCA), EU trade, the future of specific sectors such as the lobster fishery, edible fruits or tourism, or a subset of the topics. With respect to *external capacity*, regional demographics, inward and outward migration, the role of women in the labour market, the success of the emerging technology sector – all offer viable variables with which to illustrate different futures.

The key would be to select two key drivers to create the backbone for the exercise. The drivers would be high impact and high uncertainty concepts. Different drivers can be selected for different sessions. It would first be important to establish the over-arching goal of the scenarios exercise, as outlined below.

## 7.3. Steps

A common step-by-step process was developed by Kees van der Heijden et al. in *The Sixth Sense: Accelerating Organizational Learning with Scenarios* (2002). A more recent augmentation of this process is outlined in Derbyshire and Wright (2016, 261), and will serve as the step-by-step guide for this exercise. As these scholars note, “scenario planning is designed to be an organizationally-based social-reasoning process, based on dialogue and conversation, allowing participants’ perceptions of the environment to be shared and facilitating participants’ interactions as they engage in a process of sense-making through theory building and storytelling.”

### *Organizing the Session*

Van der Heijden (1996) asks “the most important question to address by the scenario planner: why do we want to do this in the first place?” The first step to organizing the scenario planning session is to establish the reason for doing so. The organization could be looking to “change the

mental map of senior executives, overcome groupthink, foster “out of the box” thinking, help planners expand the horizon of their thinking, anticipate unconventional risk and changes in the rules of the game, help align unconventional ideas in a safe setting, give new impetus to an ongoing strategic conversation, involve both line and staff in the planning process, wind-tunnel strategic options, trigger invention of new strategic options, network with new partners, and others.”

The methodology will be set by the answers to these questions. For the purpose of this example, we are working through Derbyshire and Wright’s (2016) augmented intuitive logics method. Despite this, the number of participants and length of the scenario planning exercises would vary depending on the resources available at ACOA. Ramirez et al. (2008) outline some common practices in the chart below.

Characteristics
<ul style="list-style-type: none"> <li>• Participants should reflect a wide array of different views within the agency (heterogeneous rather than homogenous)</li> <li>• The individuals selected to participate do not necessarily need to reflect the composition of the agency, but all stakeholders' interests need to be considered in some way</li> <li>• The event has to take place in an environment of mutual trust</li> <li>• The people come as individuals and do not represent the interests of the association</li> <li>• There are no hierarchies: all participants are at the same level</li> <li>• The event has to take place under social isolation, without common distracters such as daily work duties or family affairs</li> <li>• Ordinarily the number of participants varies: as few as three to as many as hundreds</li> <li>• The length of the process varies (two to three days, to 18 months, to less than two years)</li> <li>• Participants must attend the conference from the beginning to the end</li> <li>• Number of scenarios assembled (2 to 4)</li> </ul>

Table 2: Adapted from Ramirez et al., 2008, " Business planning for turbulent times: New methods for applying scenarios"

This exercise takes a foundational approach and starts from a clean slate.

Ideally, an agency should complete steps one through eight, detailed here. For ACOA's purposes, steps one through seven could be replaced with the process that led to ACOA's departmental plan and the findings that it generated; this approach would be more efficient but would limit the learning potential of the process-oriented activity.

### *Step 1: Setting the Scenario Agenda*

The first step in developing scenarios for ACOA is setting the context and timescale. It is common for this process to follow a SWOT (strengths, weaknesses, opportunities, threats) and/or PESTLE (political, economic, social, technological, legal, environmental) analysis (Van der Heijden, 2005; Derbyshire and Wright, 2016). Derbyshire and Wright (2016) propose an extended analysis that examines the various types of causes that have shaped an organization's current circumstances. The level of detail and depth of this section will vary depending on the amount of time allocated and personnel involved. Key questions might include:

- Describe the current circumstances for ACOA and Atlantic Canada.
  - A central resource for this will be ACOA's departmental plan. To define the parameters of the exercise, use the departmental results outlined in the plan. For example, as of 2014–2015:
    - 28.5% of Atlantic Canadian SMEs were majority owned by women, Indigenous people, youth, visible minorities and persons with disabilities
    - The value of business expenditures in research and development (BERD) by firms receiving ACOA program funding was \$66.2 million (2013)
    - There were 820 high-growth firms in Atlantic Canada
- What are the causal factors that have led to the current situation? For example:

- What factors have contributed to the rate of minority-owned businesses in Atlantic Canada?
- Which trends contributed to the number of high-growth firms in the region?
- What caused a step change (major factors that changed the landscape)?
  - Were there any major disrupting changes that dramatically altered the region's business environment? Starting in the 1970s, increased access to the Chinese market, for example.
- Whose "formal design" shaped the current business environment in the Atlantic region? Whose plan created or restricted the current situation?
  - To understand the future outcomes, it is important to identify the key actors, influencers and decision-makers who have created the current scenarios. What was the vision of previous governments and how did this vision impact their policy-making decisions? How have these policy decisions shaped the current business and economic climate in Atlantic Canada? What major private-sector investments were made in the region over the past decades and what was their impact? What was the intention of these investments and what was their role in creating Atlantic Canada as we know it today?
- What were the motivations behind these actors that created or restricted change?
  - To reiterate the reason for this step in the scenario planning process: we need to understand the present context before we try to anticipate the future
  - Why do the 820 high-growth firms call Atlantic Canada home?
  - What motivated the women, Indigenous people, youth, visible minorities and persons with disabilities to start small or medium-sized businesses in Atlantic Canada?
  - To lay groundwork for a plausible future, we first have to figure out what incentivizes the key actors and influencers.

### *Step 2: Determining the Driving Forces*

The foundation established in step one provides a narrative from which to determine the driving forces of the organization. Some high-level driving forces for the organization include:

- Trade agreements, policies and barriers
- Health, stock of natural resources
- Investments in infrastructure
- Population (growth or decline, immigration)
- Education, human capital, availability of skilled labour
- Commodity prices
- New technologies
- Climate-related production barriers (frost, fish stocks, hurricanes)
- Environmental/Labour regulations (federally, provincially, internationally)
- Barriers to diverse communities and marginalized groups (structural/systemic)

A more comprehensive list would directly result from the completion of step one in a group session.

### *Step 3: Clustering the Driving Forces*

To facilitate the next steps in the scenario planning process, the driving forces should be clustered in causally related categories. ACOA has partially done this in its departmental plan 2017–2018 by creating two clusters, economic context and external capacity.

Economic context includes the driving forces:

- Trade agreements
- Investment opportunities
- Infrastructure investments
- Innovation
- Climate change resilience

External capacity includes the driving forces:

- Population and immigration
- Skilled workforce
- Infrastructure investments
- Innovation

### *Step 4: Defining the Cluster Outcomes*

To help determine the most significant clusters, for each cluster we identify two extreme but plausible scenarios.

Cluster 1: Economic Context – outcomes are high economic context and low economic context

Cluster 2: External Capacity – outcomes are high external capacity and low external capacity

Each cluster outcome will include a combination of driving forces defining the situation. For example, high economic context would include strong trade agreements, strong investments in infrastructure and innovation and industries that are resilient during climate risks. Low economic context would be the result of barriers to trade, weak investments in the region, low levels of innovation, and businesses and industries that are heavily impacted by a changing climate.

### *Step 5: Impact/Uncertainty Matrix*

In this case, we already have the two most significant clusters identified, economic context and external capacity. If this were not the case, we would have to go through the process of identifying these clusters and that would be done through the Impact/Uncertainty Matrix (Figure 14). The cluster outcomes above are used to plot the clusters along the impact/uncertainty matrix. Which outcomes have the most impact on the issue of concern (in

this case, the economic health of Atlantic Canada) and which clusters are the most difficult to predict or most uncertain? Clusters need to be ranked and plotted in the impact/uncertainty matrix and the two highest-ranking clusters are identified.

In this case, we would plot things like strong trade agreements, strong investments in infrastructure and barriers to trade as driving forces in the matrix.

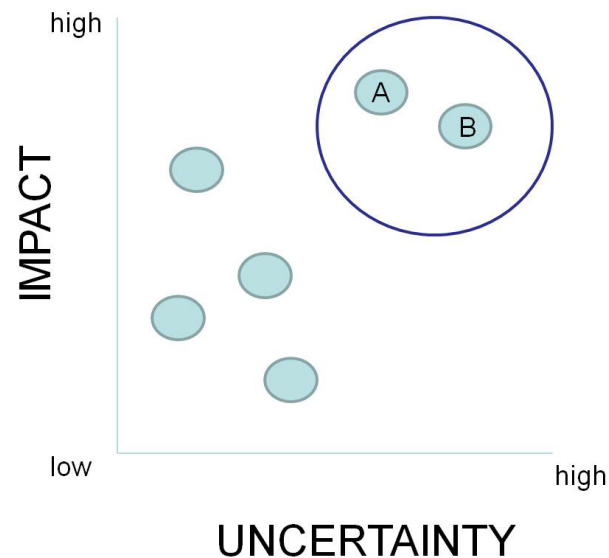


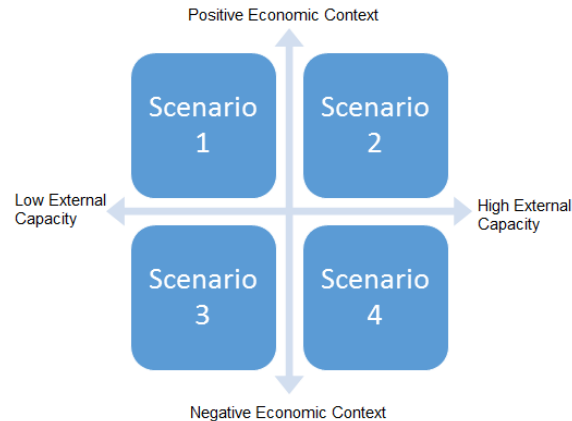
Figure 14: The Impact/Uncertainty Matrix

In this case, ACOA has identified the most significant clusters in their 2017–2018 departmental plan, those being economic context and external capacity. For the purpose of this exercise, we presume that these two clusters appear as the most impactful and most uncertain areas for the organization.

**Step 6: Framing the Scenarios**

After the selection of the two most impactful and uncertain clusters, we plot them as the axes on a 2 x 2 scenario matrix. As outlined in section 6.2, we use the “scenario matrix as backbone” formula with a resulting four scenarios. In Figure 15 we have used the two clusters: economic context and external capacity.





**Figure 15: ACOA's Scenarios Framed in a 2 x 2 Matrix**

**Step 7: Scoping the Scenarios**

Each matrix in step six establishes four unique scenarios. The final stages in the scenario planning process, steps seven and eight, work to build out these scenarios and plan for them. In this case, Figure 15 identifies four scenarios as mapped out in the 2 x 2 grid. This step involves creating general descriptors for each scenario as a basis for step 8, scenario development.

Below are examples of descriptors for each scenario.

**Economic Context vs. External Capacity**

- **Scenario 1 (positive economic context, low external capacity)**
- **Scenario 2 (positive economic context, high external capacity)**
- **Scenario 3 (negative economic context, low external capacity)**
- **Scenario 4 (negative economic context, high external capacity)**

**Step 8: Developing the Scenarios**

The final step in the scenario development process is to work with members in the organization to describe the circumstances in each scenario. Starting with the end state of each scenario, work backwards and determine what it would take to make that scenario actually occur. What are the key events and structures necessary to lead to each scenario outcome? Determine who allows or motivates each scenario to occur and why it would unfold that way. Each scenario should consist of a narrative and an understanding of how that future would unfold.

This exercise is process-oriented and the purpose is to understand all the relevant factors that could contribute to different potential futures for the organization. The participants in this exercise are meant to bring this knowledge into their future work and policy-making decisions.

As noted earlier, a scenario is not a prediction of the future but rather an attempt at understanding all the causal factors that impact the organization and how to address them.

*Addendum: Policy Development*

Derbyshire and Wright’s process would stop at Step 8. Van der Heijden, however, would include a process of developing policies in light of these scenarios. The policies would help to evaluate programs, and determine if these programs would help the organization achieve its mission, irrespective of which of the four scenarios actually occurred. In other words, the programs are not developed or approved because they are successful in one specific scenario; rather, these programs should be successful if any one of the four scenarios occurs. These policies would help the organization to become more adaptive and resilient.

## 8. Concluding Observations and Next Steps

We have identified variables that we consider “uncertain” risks in the IRGC framework, discussed in section 3. According to the IRGC framework, the process by which to manage these types of risks would include broad stakeholder engagement. The exercise could include representation from different types of organizations – public bureaucracies, private sector and the not-for-profit sector. As noted in section 7.3, however, different organizational designs will generate different organizational values and understandings of risk. This tension has to be recognized and managed.

This discussion is an introduction to how an exercise might be designed; there are many other issues that could be discussed and variables that can be employed. Further discussion with the client would be an important next step.

## 9. Appendix A: Three Schools of Scenario Planning

	<b>Intuitive Logics Models</b>	<b><i>La Prospective Models</i></b>	<b>Probabilistic Modified Trend Models</b>
Purpose of scenario work:	Multiple, from a one-off activity making sense of situations and developing strategy, to an ongoing activity associated with anticipation and adaptive organizational learning.	Usually a one-off activity associated with developing more effective policy and strategic decisions and tactical plans of action.	A one-off activity to enhance extrapolative prediction and policy evaluation.
Scope of the scenario exercise:	Can be either broad or narrow scope ranging from global, regional, country, industry to an issue-specific focus.	Generally a narrow scope but examination of a broad range of factors within the scope.	Narrow scope focused on the probability and impact of specific events on historic trends.
Methodological orientation:	Process orientation-inductive or deductive, essentially subjective and qualitative in approach relying on disciplined intuition.	Outcome orientation-directed and objective, quantitative and analytical approaches (with some subjectivity) relying on complex computer-based analysis and mathematical modeling.	Outcome orientation-directed and objective, quantitative and analytical approaches (with some subjectivity) using computer-based extrapolative forecasting and simulation models.
Nature of scenario team participants:	Internal – scenarios developed by a facilitator, may come from within the organization.	Combination of some key individuals from within the organization led by an expert external consultant.	External – scenario exercise undertaken by expert external consultants.
Role of external experts:	Experienced scenario practitioner to design and facilitate the process; periodic use of remarkable people as catalysts for new ideas.	Dominant - expert-led process using an array of proprietary tools to undertake comprehensive analysis and expert judgments to determine scenario probabilities.	Dominant - expert-led process using proprietary tools and expert judgments to identify high-impact unprecedented future events and their probability of occurrence.
Scenario starting point:	A particular management decision, issue or area of general concern.	A specific phenomenon of concern.	Decisions/issues for which detailed and reliable time series data exists.

Identification/selection of key driving forces:	Intuition – brainstorming techniques, analysis of STEEP factors, research, and discussion with remarkable people.	Interviews with actors involved in the phenomenon being studied and comprehensive structural analysis using sophisticated computer tools.	Fitting curves to historical time series data to identify trends and use of expert judgment to create database of potential high impact unprecedented future events.
Scenario exercise output:	Qualitative - set of equally plausible scenarios in discursive narrative form supported by graphics, some limited quantification. Implications, strategic options and early warning signals increasingly a part of scenario output.	Quantitative and qualitative – multiple scenarios of alternative futures supported by comprehensive analysis incorporating possible actions and their consequences.	Quantitative – baseline case plus upper and lower quartiles of adjusted time series forecasts. May be embellished by short storylines.
Probabilities attached to scenarios:	No, all scenarios must be equally probable.	Yes, probability of the evolution of variables under assumption sets of actors’ behaviour.	Yes, conditional probability of occurrence of unprecedented and disruptive future events.
Number of scenarios generated:	Generally 2–4.	Multiple.	Usually 3–6 depending on the number of simulations.

Table 3: Adapted from Bradfield et al. (2005) “Comparison of the Salient Features of the 3 Schools of Scenario Techniques”

## 10. Appendix B: Excerpt from ACOA 2017–2018 Departmental Plan

### *2017–18 Departmental Plan*

#### *Operating context: Conditions affecting our work*

“Over the long term, economic growth in Atlantic Canada will be driven by a combination of factors: the development of emerging and value-added sectors; significant investments in industrial projects; and global economic developments, including greater access to international markets and innovation. Growth in real gross domestic product (GDP) in the region, however, is expected to remain modest in 2017 and 2018, and below the national level.

Atlantic Canada’s economy continues to face several risks. As a small, open economy, international competition from low-cost producers will continue to challenge Atlantic Canada’s manufacturing base and resource industries. Atlantic exporters, however, should benefit from stronger growth in the United States and a stable exchange rate as the Canadian dollar is projected to remain in the US\$0.75 to \$0.80 range.[1] Energy prices are also expected to improve somewhat in 2017, helping lift exports from the Atlantic region in the short term. A stronger housing market in the United States will support further growth opportunities for the region’s forestry sector, but the lack of a softwood lumber agreement between Canada and the United States poses a risk to lumber producers.

Lower commodity prices could create challenges for investment projects in the region. Major project investment is expected to provide little support for growth in 2017 and 2018, as many large investment projects are winding down. The stable Canadian dollar, however, is expected to help the region’s manufacturers, increasing demand for their products. The manufacturing sector is also projected to get a boost from the rise in shipbuilding activity, as 2016 was the first full year of activity for the National Shipbuilding Strategy.

An aging population will also have an impact on the region’s labour force, limiting Atlantic firms’ access to an adequate workforce. An increase in the participation rate of under-represented groups in the labour force, such as women, youth, Indigenous peoples, and persons with disabilities, will be key for the region’s firms to meet their labour needs over time. The attraction, retention and integration of immigrants, and speedier recognition of their foreign credentials, would also support Atlantic firms in meeting their labour requirements.

Atlantic Canada continues to experience skills shortages in knowledge-based professions (i.e. science, technology, engineering and math), as well as in various trades (affecting major projects such as shipbuilding). Over the past few years, some seasonal industries that rely on a lower skilled workforce have increased their reliance on foreign employees, due to an insufficient workforce to meet their labour needs in the largely rural communities where they are located. Access to both skilled and unskilled labour will be a key determinant for increasing

the region’s competitiveness, productivity, innovation capacity, and economic growth over the long term.”

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