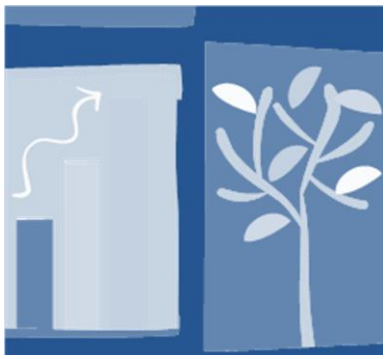
Leading the Pack or Lagging Behind:

A Foresight Study on Environmental Sustainability and Competitiveness

(Full Study)

2011

Policy Horizons Canada



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Why Foresight?

No one can predict the future – but foresight studies use a structured approach to examine the relationships among actors in a system, key assumptions, uncertainties, those factors driving change, and expected and unexpected outcomes which allow us to identify a range of ‘‘plausible futures.’’ Such studies, when conducted by governments, allow policy makers to reflect on how the environment is changing and what additional information and planning may be required to ensure resilience.

This study, which draws on insights provided by experts from both the public and private sector, uses four scenarios to examine the relationship between the environment and the economy and the consequences of that relationship for Canada’s future competitiveness.

What you are about to read:

Acknowledgments

This foresight study has benefited from the contributions of many individuals. The ten national experts identified in Annex B graciously volunteered their time to be interviewed. Over 20 federal officials formed an External Advisory Committee and took part in a series of four workshops held in May 2011 at Policy Horizons Canada. The Horizons Environment and Competitiveness Foresight Team: Teresa Bellefontaine, Stefanie Bowles, David Cavett-Goodwin, Nicola Gaye, Peter Padbury, Alan Painter, Peter Reinecke, Julie Saumure, Greg Wilburn.

THE ECO-ECONOMIST

The Competitiveness Issue

September 2025

Energy Prices and Value Chains

Standards, Standards, Standards - which one matters?

Fiscal Policy – what do domestic policies mean for your ability to compete globally?

Triple Bottom Line Accounting – trickling-up but context is everything

Government and Resiliency – what have they done for you lately?

World Economic Forum + OECD Redefine Competitiveness – what does it mean for world markets?

To find out why this publication is one of the most read in 2025 read on…

Any organization that is not carbon neutral through the entire cycle of their business by that time will run the risk of losing public trust. Who do you think said that? A leading aerospace company. They are saying that if they can't offer a carbon-free flying experience they will not have passengers, because one of their competitors will be offering it by 2025.

-Foresight study participant

Environment and Competitiveness - What's the Connection?

Canadian businesses, governments, and society are operating in a multi-faceted environment, characterized by rapid technological change, complex regulations, standards and norms and growing pressure to adapt and remain competitive.

Simultaneously, concern about the natural environment is rising as knowledge about environmental problems and their connection to both short and long-term well-being increases.

This mounting concern for sustainability and the rapidly evolving competitive environment are set to continue to impact our individual and collective operating environments over the next 10-15 years. They lead to some key assumptions, further elaborated on page 13.

Determinants of competitiveness at the individual, organizational and national levels are both changing and intensifying. While traditional determinants like price and service remain paramount, competitive resilience (the ability to continue to meaningfully compete and add value in a complex and continuously changing operating environment) is increasingly determined by one's ability to:

- ensure continued access to key resources;
- manage supply chain risk;
- attract the best and most committed people;
- move up the value chain as value-for-money propositions evolve; and
- ensure access to markets.

Waves of innovation, both technological and social, are rising in response to environmental concern. The application of information and communication technologies, increased specialization, and increasing collaboration and transparency are fundamentally changing how we do business. As organizations seek to set the foundation for competitive resilience, we see "pre-competitive" spaces emerging in which best-practices are shared before going to market. Simultaneously, "green" marketing is increasing as firms attempt to communicate their efforts and capitalize on popular green values.

Regulations: performing "beyond-compliance". Increasingly, being in regulatory compliance is not enough to satisfy the additional environmental and social demands of consumers, supply chains, investors and employees.[1] As values change and manifest in purchasing decisions, and as firms seek to manage risk in their supply chain, new value propositions, business models, and portfolios are emerging. We see signs that the tactics of governments are changing too, as they seek to support the "green" case of firms located in their jurisdictions across a fragmented landcape of standards (for example by developing carbon footprint programs for exports such as France). Porter's hypothesis that high standards can enhance competiveness is manifesting dynamically in the marketplace.[2]

Furthermore, many established indicators and metrics of competitiveness don't reflect environmental sustainability concerns today.[3] At both the organizational and at the national levels, how will these evolve into the future? As we enter a beyond compliance environment, what is the role of government moving forward?

"Competitiveness and productivity are tough nuts to crack. We have lower taxes, freer trade, interest rates are good, and the dollar has made machinery cheaper. These should be competitive-enhancing things, yet people are not investing."

- Foresight study participant

Policy Horizons Canada's Contribution to the Dialogue

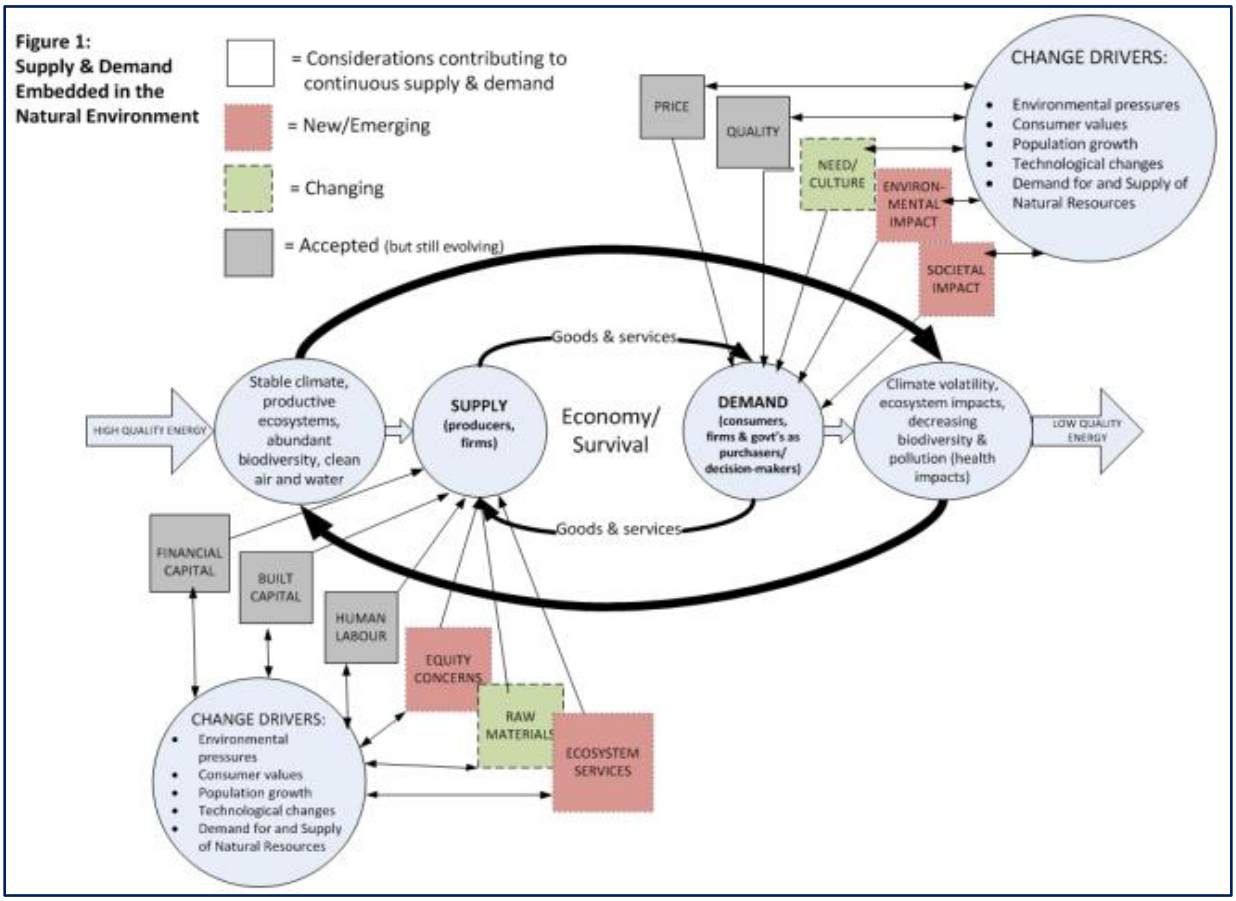
In response to this rapidly changing landscape, Policy Horizons Canada has applied a structured approach involving both government and non-government experts in a process to facilitate reflective and creative thinking about what the future may hold for Canada with respect to the determinants of competitiveness over the next 10-15 year period.

This foresight study explores plausible futures by: identifying the key factors driving change, mapping out principal actors and their relationships and boundaries, identifying and deliberating on key assumptions, and looking for surprises.

The key question guiding the process was: *What are the federal policy implications of increasing interest in reconciling economic growth, environmental sustainability and prosperity?*

This central challenge considered the following issues:

- Does the shifting landscape present opportunities for Canadians?
- What key factors will influence competitiveness in Canada?
- Are Canadian firms likely to find it difficult to access supply chains and foreign markets because of environment-related requirements?
- What is the role of government in supporting new and evolving markets,



such as clean technologies?
- What new information and indicators are needed to monitor Canada's performance and support decisions?

The results of the exercise will be shared with policy-makers and will inform the federal government's medium-term policy analysis, research, and data-development priorities.

Figure 1 on the previous page offers a graphical view of the system under examination. It examines the changing relationship among producers (supply) and consumers (demand) embedded in the physical environment. The graphic shows the growing number of factors, and associated drivers influencing the system.

We can't "Predict" Changes in a System, but we can Examine those Factors that Influence it

Sitting at the intersection of environmental sustainability and economic competitiveness are five main change drivers.

1. Environmental Pressures

Complex global and local environmental pressures are an operational reality for Canadian firms.

The operating environment for firms is increasingly defined by global and local environmental factors. The impact of humanity on nature in recent years has become increasingly significant and is now considerable. With respect to the climate, 2006 marked the 30th consecutive year that warmer-than-average temperatures were recorded across the world, a trend that shows no signs of abating as atmospheric greenhouse gas concentrations continue to increase and as the impact of past emissions continue to be realized.[4]

The likelihood of one single environmental event causing fundamental global change is low. Climate change, for example, is expected to have a wide range of significant localized effects. Resource degradation and scarcity will also have direct impacts on human health and markets. Particulate matter pollution, nitrogen levels, ground level ozone, and chemical exposures are four sub-trends that warrant particular attention due to their complex and potentially far-reaching effects on the ecosystem function, climate regulation and human health.[5] While growing environmental pressures will be an operational reality for firms in the future, interactions with socio-economic issues will determine the extent of their potential to drive change.

2. Consumer Values

Consumers, procurers and investors are leveraging their purchasing decisions as a way to express environmental and social values.

Environmental concerns are manifesting in the marketplace through consumer values. In graph 1, US research on consumer values show that

Systems are Rarely Static

The degree of dynamism is generally dependent upon the significance of the factors affecting a given system. In this foresight study, five important change drivers have been identified and their relative impacts on the system explored in each of the scenarios:

1. Environmental Pressures
2. Consumer Values
3. Population Growth
4. Technological Changes
5. Supply and Demand for Natural Resources

The examination of the interaction of these change drivers with the assumptions and uncertainties form the basis of the scenarios that were identified.

between 2005 and 2009, those factors relevant to consumers are rapidly changing. Changing attitudes affect how value-for-money propositions are understood and are re-defining the competitive environment for brands.[6] If these trends continue, we expect to see evolving brand identities and an increase in the importance of real-time communication of environmental and social information to inform purchasing decisions.

Less subtle but no less dramatic are major private sector initiatives, such as Wal-mart's supplier information requests which introduced 15 sustainability related questions/expectations for all suppliers and would-be-suppliers to the company.[7] Such approaches introduce new information, measurement, and accounting requirements along supply chains, and provide consumers and producers with new criteria for decisions. An even larger purchaser than Wal-mart is the US federal government, whose 2009 Executive Order 13514 revitalized green procurement at the federal level, as did Canada's 2006 Policy on Green Procurement and Canada's *Federal Sustainable Development Act* (2008).

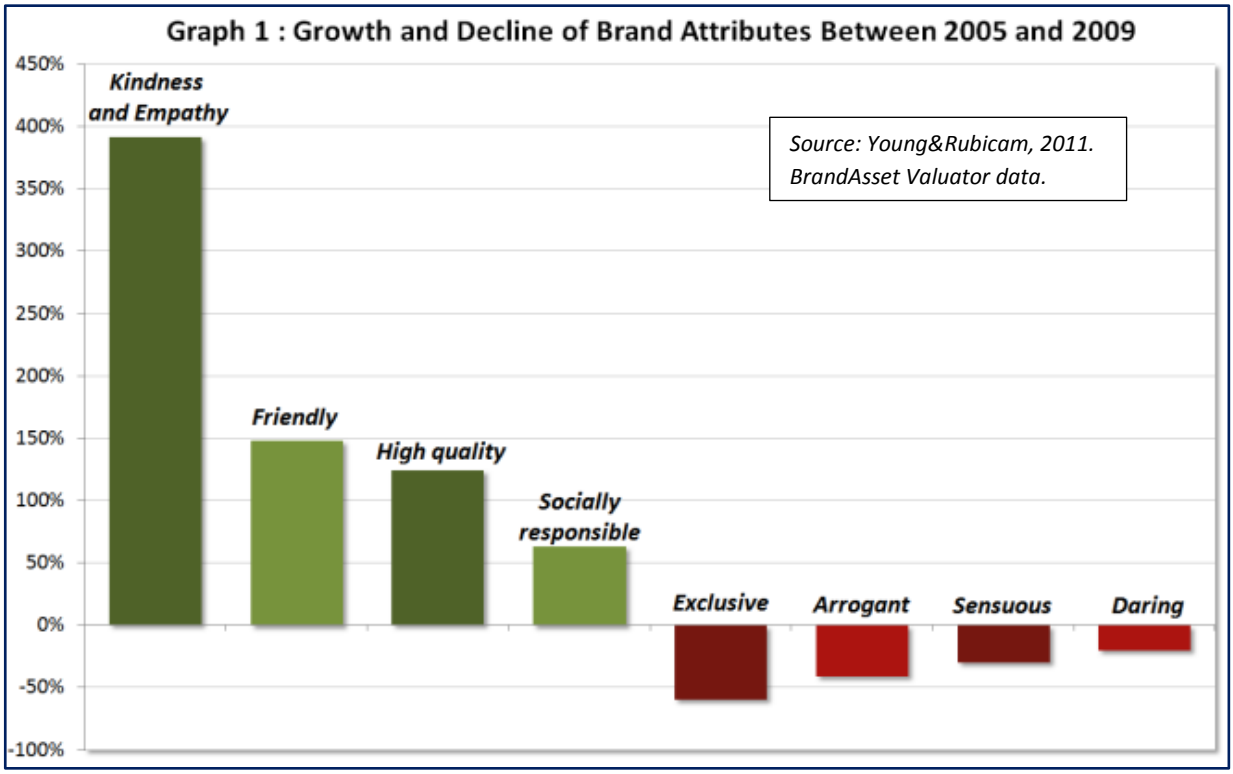
3. Population Growth

The global population is increasing, as is population aging in some countries, exacerbating environmental pressures and affecting labour market composition, with significant regional disparity.

The current global population sits at 7 billion as of October 2011, and will reach 8 billion by 2024.

In May 2011, longer-term UN population projections were revised upwards from 9.1 to 9.3 billion humans by 2050, with the high variant sitting at 10.6 billion by 2050. Much of this increase is projected to come from the high-fertility and less-developed countries, which comprise 39 countries in Africa, nine in Asia, six in Oceania and four in Latin America.

While global population growth is expected to continue, more than 20 countries are simultaneously projected to experience population declines in the upcoming decades, primarily due to low fertility rates in high income countries. In Canada, by 2025 the first of the baby-boomer generation will reach age 80, with most boomers being around 70. Canada's prolonged period of



low fertility means that in 2025 there will be relatively few youth replacing baby boomers in the labour market. By 2025, only immigration will prevent an actual decline in the overall Canadian population (see Horizon's foresight study Re-defining Progress: The Well-being Objective for more details).

High consumption lifestyles require relatively more resources of all kinds per capita. Often resources are imported and waste is exported, a phenomenon set to increase in light of growing urbanization. For the first time in history, more than 50% of the world's population lives in urban areas, and by 2050, about 70% of the world's population are likely to be city dwellers, compared with less than 30% in 1950.[8]

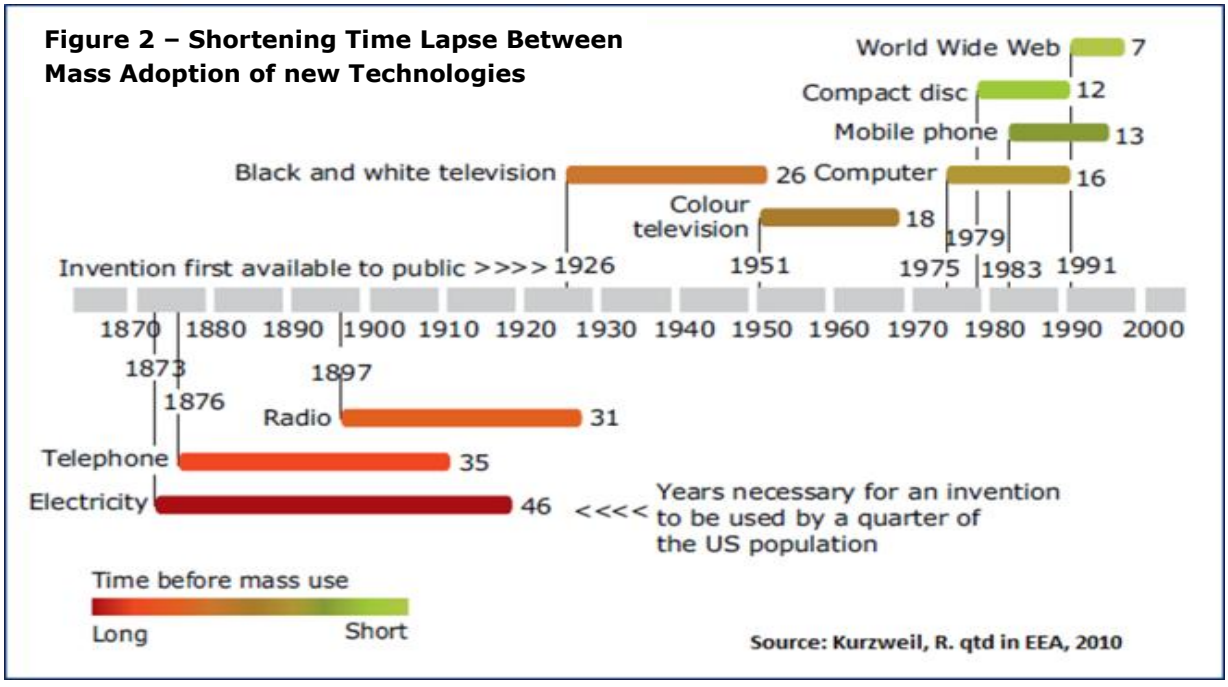
4. Technological Changes

The pace of technological innovation and dissemination is increasingly rapid; it has the potential to both reduce environmental pressures as well as increase them.

Technological innovation is often heralded as the great reconciler between environmental and economic objectives. Some believe that technology will save humanity from the negative environmental effects of industrialization, while others consider technology to be the cause of industrialization's negative effects, which further distances people from nature. Both of these perspectives manifested over the course of our study.

Technologies at their most basic are human-created tools that move matter and information to achieve humanity's objectives. The pace of dissemination of new technological innovations is increasing (see Figure 2 below) as time to mass market penetration decreases for a host of new technologies. The increasingly rapid penetration rates can also be seen globally, with the rise of middle class in emerging economies. As they seek to meet specific societal and/or commercial objectives, technologies often generate risks. There can be tensions between the competitive need to hasten time to market and maintain confidential information, and the need for adequate time and sufficient information for risk assessment. How technology affects our understanding of our objectives by altering the types and frequency of communication is most fundamental, as conceptions of human connectedness, reputation, wealth and status evolve.

Figure 2 – Shortening Time Lapse Between Mass Adoption of new Technologies



5. Supply and Demand for Natural Resources

Despite eco-efficiency gains, demand for energy and natural resources is growing as standards of living increase.

As emerging economies grow richer and more populous, resource demands invariably increase. China's share of global GDP is expected to grow from 7% in 2010 to 18% in 2050. For India and the ASEAN-5 countries (Philippines, Indonesia, Malaysia, Singapore and Thailand) projections are equally impressive, from 2.1% to 5.1% for India and from 1.7% to 4.8% for ASEAN-5.[9] As mobility, meat consumption and home heating and cooling increase, resource pressures also increase.

This growth in demand for agricultural output is set to have considerable implications for land use and natural ecosystems. A projected population increase of 27% and a wealth increase of 83% by 2030 would imply a demand for agricultural production that is 50% higher than today's. Even if agricultural productivity increases at current rates, it would be necessary to expand the global agricultural area by roughly 10% to meet demand.[10] Demand for land and resources is so intense that a new form of land tenure agreement – often referred to as a "land grab" – is emerging. Food-importing countries and private investors are acquiring farmland across the developing world, often in the form of 99-year leases.[11]

Given Canada's large land and water holdings, what are some possible challenges/opportunities for Canada? Some uncertainties? Does today's policy framework allow us to be prepared for these?

"From an operational standpoint, I can't see a scenario where sustainability won't become more important – the trends are too strong globally."

- Foresight study participant

Uncertainties Influence Change

Governments, organizations and individuals deal with uncertainty on a daily basis. Although the future path is unknown, the uncertainties (Table 1) can be applied against the change drivers to identify the plausible futures represented by the scenarios. Presented as binaries for simplicity, uncertainties unfold differently in different plausible futures.

Table 1

Key Uncertainties	Characteristics
Individual versus Collective Action	Action to address policy issues occurs on a continuum, that spans individual persons and actions at one extreme, to coordinated, collective multilateral action at the other.
Short versus Longer-term Planning	Actions to respond to policy issues can be viewed in terms of their impact across time, from immediate (now) to the longer-term (25+ years).
Global versus Regional	Responses to policy issues can be managed at the global, regional or local levels.
Self-organized versus Co-ordinated	Issues can be addressed by small communities of interest or coordinated across domains by national or multilateral organizations.
Economic Growth versus Sustainability	Traditional notions of growth focus on economic indicators, whereas sustainability attempts to integrate across domains (social, economic, environmental, and political) and across time.

Scenarios-at-a-glance

Scenarios conceptualize interactions among assumptions, change drivers and uncertainties. This supported looking for emerging issues, potential discontinuities, and opportunities (both Canadian and global). Detailed scenarios can be found in **Annex A**.

Four scenarios were developed, one for each of the following standard types:

- **Muddling Through**
- **Gradual Progress**
- **Slow Decline, and**
- **Transformation**

Hope to get there one day…trade issues? What trade issues?	**Opportunity knocks! Co-ordination rules**
A world with steadily rising energy prices, a strong tendancy towards individualism and a focus on the short-term, occupied by self-organized networks operating under their own standards. [Muddling Through]	A world moving slowly toward collective and coordinated responses to global problems, looking beyond the immediate future, but wrestling with the challenges of shifting roles and responsibilities. [Gradual Progress]
Fortress Economy – short-term growth comes out swinging	**Be the change – institutions that matter support sustainability**
A deteriorating world characterized by short-term focus on economic issues, where like-minded coalitions try to fill gaps and address growing problems. Primary focus on traditional notions of growth. Survival of the fittest. [Slow Decline]	A rapidly changing world with a long-term view, and a strong tendency towards collective action focused on institutionally supported sustainability responses to emerging issues (e.g. consensus on assessing progress and measures to complement GDP, heavy investment in renewal and a functioning standard system). [Transformation]

What Key Factors are Likely to Influence Competitive Positions in an Uncertain Future?

The study resulted in the identification of a number of key issues and questions for policy-makers in relation to the next 10-15 year period. The following are areas of considerable systemic leverage, and given their importance, are highlighted as key challenges and opportunities.

Energy Pathways and Prices are Wildcards

Factors influencing energy demand include policies that will affect the relative price of energy sources, such as those around carbon pricing, the phasing-out of fossil fuel subsidies by G-20 nations (2009 commitment, G-20 Summit Pittsburg), and R&D investments in clean technologies. Investments in clean tech are already in the trillions worldwide, large enough to suggest that some 'game-changers' will likely appear within 10 years. However dissemination, infrastructure and interoperability challenges will likely remain, depending on the scenario and the technology (e.g. smart grids, electric cars, solar panels, etc.).

The traceability of the source and impact of different energy sources/locations is set to be significant. The need for competitors to differentiate themselves, ICT-induced transparency and the shift in consumer and investor values all create prime conditions for traceability to significantly affect energy demand by 2025. While it remains in its early days, as market access and supply-chain access issues increase, those jurisdictions that can generate high-quality, low-emission (and relatively low-cost) energy as an economic input are poised to reap competitive benefits. To the extent that the emissions profile is traced and communicated, both the energy input and the resulting economic output will be more economically attractive (or unattractive). This market-generated dynamic is set to increase, with or without territorially imposed regulation, taxation, or cap & trade regimes.

Note that the emissions story is not all of the traceability story in the energy world: geopolitical considerations, security, biodiversity, labour standards and safety are all factors as well. However, up and downstream carbon intensity is emerging as a key metric, and the assessment methodology is becoming more sophisticated and neutral, e.g. through the development of arms-length life-cycle assessment inventories. While extraction costs in terms of dollars and emissions for unconventional oil production (e.g. the oilsands) are higher, geopolitically and socio-economically Canada has a better story to tell than many other oil-exporting regions. Fundamentally agreeing on a metric and a methodology with key trading partners will be essential, as was the case when Canada and the US developed a joint chemical substance risk assessment methodology in the Four Corners Arrangement circa 1996.

"We know the Chinese want mobility, but we don't know the energy pathway they will use to meet those needs – our product may be replaced sooner than we think."

-Foresight study participant

The viability of scales of production is also intimately related to energy pathways and prices. When conventional fossil fuel energy is inexpensive, longer and more specialized value/supply chains are possible, with system-wide implications. Mass-produced specialization and high levels of trade fuel GDP growth and support employment, all made possible by low-cost high quality energy inputs along the value chain. Key will be how and, perhaps more importantly when, organizations at all levels adapt and diversify as we respond to energy input changes.

Energy is going to remain key in the competitiveness dialogue? What will Canada's position be – stay the course or lead through innovation?

Standards aren't Standard Anymore

For decades, being in compliance with regulations was all a company believed it had to do to address its environmental impact. While regulatory compliance will remain important, the proliferation of actors and the standards they support/require/encourage is leading to a "beyond compliance" operating environment. As standards become more visible and contribute to value-for-money propositions (e.g. LEED certified homes, or Alberta AAA beef, etc.) the emerging role of standards as performance enablers as opposed to performance constrainers is striking.

Changing consumer values and the rise of networks and supply chains with their own requirements are manifesting starkly as standards proliferate. Being able to competitively position oneself in both a regulatory compliance environment and in a norms-based environment will become more important, especially as organizations seek to differentiate themselves and move up the value chain.

In a transformation scenario, co-ordinated, multilateral efforts influence the development of standards intended to support collective action. In slow decline and muddling through, those standards are less coordinated, and often conflicting. They are designed to secure market share, rather than support progress on persistent socio-economic sustainability issues. In either case, the potential of those standards to affect Canadian competitiveness is clear. Protectionism is a possibility. Domestically, consumers will be using standards to inform their decisions. Internationally, Canada's ability to compete could be seriously impacted by standards that governments have less and less ability to influence and control, as Canadian firms may be excluded from markets and supply chains. International cooperation on a few key international standards could have far reaching results for both leveling the playing field and improving socio-environmental outcomes.

There is clearly a changing role for the government as the guardian of the public interest. The different ways in which marketplace assurance, trust and legitimacy is generated globally is emerging as a challenge area, and the rise of non-state actors and pluralism that is difficult for governments to manage appears inevitable. In slow decline, the potential for more actors to identify a greater number of priorities is significant, and no clear consensus on the role of regulators as generators of marketplace legitimacy emerges. Even in transformation (notwithstanding a growing interest in coordinated action) establishing regional, national and global priorities and assuring progress towards those priorities will remain challenging.

"Our clients see sustainability as another lens to evaluate the quality of management. This lens will be increasingly important in the future – it gives investors and managers a pair of binoculars to look into the future instead of a rear view mirror."

-Foresight study participant

Interviewed experts from the for-profit sector noted that getting clarity from governments on standard-related regulatory questions can be helpful for businesses. Regulatory uncertainty can make it difficult for businesses to estimate returns on potential long-term investments, thereby discouraging those investments.

What are the levers government needs to influence a fragmented standards landscape and what are the implications for accountability, a level playing field, investment, and the dissemination of innovation and best practices?

Policy Instruments beyond Regulation – Behaviour Change

During interviews with experts and during scenario building, there was a clear sense that new types of interventions would be needed to achieve multiple objectives simultaneously. The issue of fiscal policy was raised, in which taxation is seen as a possible means to re-structure incentives in favour of sustainability. An important variable across the scenarios is the level of co-ordination among trading partners, and globally. One of the key issues that was raised was the possibility that Canada may lose some of its competitive advantage to those states that are moving away from taxing investment and payroll towards tax systems more focused on taxing pollution and socially undesirable behaviours.

If things remain static in this area at the federal level, Canada may perform poorly on national evaluations by organizations such as the OECD (e.g. in terms of OECD Green Growth indicators which should be more fully developed by 2025). The comparability of sustainability metrics was identified as an important policy area, as were policy instruments which can impact behaviour, for example labelling, nudging, and social marketing.

What would be the implications of moving towards a system of taxing negative externalities instead of income and payroll?

Is it Time to Complement GDP with other Indicators of Well-being?

An axiom of management theory is that you manage what you measure. Continued singular focus on GDP, a flow measure concerned with economic activity alone, is paradoxical, when well-being depends on social and environmental factors, and on stocks as well as flows.

National governments (such as China, France and the UK) and multilateral institutions (such as the OECD and the UN) are working on new ways to measure sustainable wealth and better manage our resources over time. The OECD's "green growth" indicators include:

- Environmental and resource productivity
- Natural asset base
- Environmental quality of life
- Economic opportunities and policy responses[12]

In the muddling through and gradual progress scenarios, GDP remains central, but more and more countries contextualize it in a "dashboard of indicators" of well-being (e.g. health, income distribution, natural capital stocks, environmental taxation regimes, etc.). Here, national governments are obligated to report transparently, which could affect relative standing globally.

In a slow decline scenario, a lack of consensus among countries on the details of new measures of national wealth affects the ability of governments to compare themselves to each other, fundamentally undermining the reciprocal utility of these new indicators and allowing short-term growth to dominate. In the transformaton scenario, agreement is reached on a new indicator, allowing institutions to support sustainability, particularly financial and statistical institutions that act in concert. This would allow for a much more level playing field, and should reduce the most negative effects of profit seeking competition as determinants of national success move beyond a singular focus on increasing the flow of goods and services.

What indicators of well-being should be reported alongside GDP as a matter of course? Is the international system in a position to achieve consensus on a new indicator or suite of indicators? Given the diversity of circumstances across jurisdictions, is a common set of indicators possible, or even desirable?

Resilience is a Good Strategy in the Face of a Rapidly Changing Operating Environment

Resilience in a system or organization provides the capacity to adapt to shock without catastrophic failure. Resilient organizations and systems are

ones in which power and risk are not overly concentrated and where redundancies are built-in, so if one part goes the whole thing doesn't shut down. They also maintain a balance between collectivized, institutionalized risk and autonomy of individuals, divisions or regions via principles of subsidiarity. Resilient organizations are able to avoid some risks and effectively respond to the others.[13]

A concern which manifested throughout the scenarios is placing too much emphasis on the short-term; there can be tension between short-term and long-term resilience. Actions taken to pursue profitability over the short-term can reduce longer-term resilience. Resilience can be compromised by reducing risk-mitigating redundancy to reduce short-term costs, maintaining one supplier not several, exploiting natural resources as quickly as possible and externalizing costs.

Depending on the scenario, if investors, consumers and governments begin to reward firms that internalize costs, new challenges emerge in verifying these cost-internalization claims. Good information on what is going on helps to manage risk.

Resiliency will become increasingly important for organizational effectiveness in the private and public sectors. Organizations will need to adjust their practices to continue to satisfy their missions in an ever faster changing environment. Organizations that don't remain flexible and focused on the longer term will crash or fade away.

How can individual organizations and firms best achieve resiliency internally and externally, and what can governments do to help?

Concluding Observations

As one of our study participants observed, competitiveness and productivity are indeed tough nuts to crack. Canada's future could be characterized by considerable uncertainties with respect to:

- Natural resource markets;
- Shifting standards and changing actors;
- Shifting fiscal policy among our major trading partners;
- Changing indicators of competitiveness and well-being; and
- A growing need for improved resiliency within society, governments and markets.

Policy Horizons Canada looks forward to working with our partners to continue to explore these complex issues.

Annex A – The Four Scenarios

''Within 15 years the incontrovertible evidence of the adverse effects of climate change will be accelerating and will be broadcasted on a 24 hour environmental news network channel.''

- Foresight participants

Muddling Through - hope to get there one day….trade issues? What trade issues?

This world has not seen galvanizing environmental or economic crises, but there is a continued overall environmental and economic decline. Markets are characterized by persistently tepid confidence levels, short-term spending for quick-hit returns, and a relentless search for export markets. The focus, at the national and global levels, is on putting out "environmental fires": governments are responsive, not proactive on environmental issues, and non-regulatory barriers to trade proliferate as consumers and non-state actors try to fill the void.

Governments are focusing on national and regional issues, and as a consequence there is little agreement on global rules and multilateral organizations aren't able to coordinate. Some regions such as ASEAN institutionalize more substantively and create regional standards in a common market, following in the path of the EU, while other countries primarily pursue bilateral trade deals.

China's economy is surging and technological change is occurring rapidly in some areas, such as Asia, and in some sectors (clean tech), but absolute environmental impact continues to increase.

Status-oriented consumerism and material inequality are on the rise around the world, although boycotts and buycotts are shaping corporate strategy in a limited way. A stable but declining resource base means that consumers and producers are paying more, but that resources are still available (and innovation and substitutability are making some shortages manageable). But in the developed world, the transition away from traditional industries based on innovation isn't going fast enough, and there is growing economic stagnation. A stable, but increasingly more expensive, supply of energy and other resources is gradually forcing more sustainable practices.

The global population is growing and production and transportation costs are creating challenges for feeding the poor. Migration away from least developed countries, as a consequence of environmental change and population growth, is creating growing challenges for developed economies.

Businesses are responding to new consumer values with green-wash. Corporate social responsibility is about charity and to a lesser degree firm reputation, and not about efficiency or effectiveness. Governments are put in the position of having to endorse their own domestic firms' green claims – and tension among corporate, regulatory and non-governmental actors and communities is growing.

Some News Headlines from 2025

- **EU, China hit Canada with carbon border tax adjustments**
- **Smart North American energy grid mired in red tape**
- **Critics claim Canada's Species-at-Risk Act ineffective as the list of endangered arctic animals grows**

Gradual Progress - opportunity knocks!

Co-ordination rules

This world is characterized by slow, but measurable, progress on environmental issues. Indicators on some metrics are improving. Governments are experimenting with market mechanisms, influenced by multilateral institutions and instruments relying upon the "Copenhagen" model (acknowledgement of challenges, differentiated targets, tailored domestic/regional approaches, monitoring and reporting). High energy prices and resource challenges are affecting competitive advantage. This drives increased investment in environmental product and process innovation and communication along supply chains.

Individual and national well-being remain focal points, while multilateral institutions are legitimate and collaboration among governments is taking place. Governments and institutions are trying to plan for the longer-term. Coordination among global, regional and likeminded jurisdictions is growing – and there is an evolving emphasis on sustainability.

The global environment is still declining in this scenario, but there are improvements in some areas, such as greenhouse gas emissions, particularly in those countries that have access to, and can afford, alternatives. The role for new analytical tools in this scenario, such as ecosystem approaches and natural capital valuation, are evolving to support full-cost accounting. Although there is little coordination, recognition of the value of such approaches is growing and affecting multilateral institutions.

Governments are not setting standards, but are working with industries to put in place principles for industry-led standards that reach across boundaries. This creates potential market barriers for those jurisdictions that cannot meet them. Rising energy costs encourage shortening of value chains which has an impact on the volume of (imported and local) goods and services we consume. This combined with an aging population in emerging economies supports the repatriation of manufacturing capacity in some developed economies. Increased investment in environmental innovation in areas of comparative strength pays off. New business models and scarcity further drive innovation on alternatives. Regional disparities among and within countries grow based on the relative ability to innovate and adapt. Nonetheless, stable global commerce means that there are growing opportunities for all, and where there are mutual benefits, multilateral economic institutions are able to coordinate collective action. Population growth is likely to slow, given improving socio-economic conditions in emerging economies.

Multilateral institutions are facilitating sustainable development through improved risk assessment, green growth models, and natural capital valuation. Environmental sustainability gradually becomes a determinant of national and firm level competitiveness. Businesses are seeking level playing fields across jurisdictions but are also realizing that sustainability is about efficiency and reputation – capital markets begin to insist on it. Non-government organizations and industries form coalitions based on mutual interests. A proliferation of overlapping environment and efficiency standards has the potential to create increased costs, trade barriers and confusion for industry and consumers.

Some News Headlines from 2025

- **Global agreement on world carbon market, but key players yet to sign**
- **Canada faces choice as America, EU and China battle over green standards**
- **Civil servants encouraged to practice sustainable commuting, lead by example**

Slow Decline - fortress economy - short-term growth comes out swinging

The world is characterized by a persistent economic recession. Environmental metrics, as well as economic and social metrics, are in decline across the board. The extent of government debt in the west precludes fiscal solutions. Governments concentrate on economic issues at the expense of addressing growing environmental and social problems. They face significant and conflicting pressure to both raise protectionist barriers and maintain open trade. Ways have not been found to reconcile environmental, social and short and long-term economic issues.

National governments are focusing almost exclusively on short-term domestic economic stability. Although coordinated action to address growing environmental and social problems would be beneficial, growing pressures on multiple fronts are resulting in overlap, confusion, and protectionism. There are token efforts to encourage sustainability, but the primary focus is on addressing the economic down-turn. Only when environmental sustainability is in line with immediate economic objectives is sustainability considered. The growing middle class in emerging economies is adding significantly to global environmental pressures.

Multilateral processes aren't yielding results on climate change, and emissions are rising as both developed and emerging economies rely on traditional energy sources that can be obtained cheaply (with coal predominating). Water scarcity is leading to conflict, and in extreme cases, migrations. Consumers, because of high unemployment, falling wages and growing resource scarcity, are less willing or able to express environmental and social preferences with their dollars. In response, producers focus on lower costs and little else. Financial markets are tight and conventional business cases win. Governments are disinclined to address negative externalities in ways that might reduce short-term growth.

Innovation is largely occurring only where private benefits are high – the focus is on cost-savings. The rise of emerging economies increases the demand for consumer goods and for cheap energy. Competition – and potential conflict – among states for off-shore and trans-boundary resources (fisheries/water) is further affecting bilateral and multilateral relations. Population growth in least developed countries has devastating consequences when considered within the context of the global downturn and growing environmental pressures. Economic and environmental refugees from these areas are growing at the same time as the willingness and capacity of developed and emerging economies to absorb them is shrinking.

The world is in transition from uni-polar to multi-polar with the rise of emerging economies. This, in combination with growing pluralism, makes it hard to set agendas or come to agreement. As a consequence, regional approaches begin to dominate. Nonetheless, multinationals are continuing to push for global trade and standards regimes that maintain the global flow of goods and services.

Some News Headlines from 2025

- **Jobs trump environment again; regulatory cuts aim to spur the economy**
- **Breakdown in international talks; grab for Arctic resources begins**
- **USA closes border as food scarcity fuels protectionism and fear**

Transformation - be the change: institutions that matter supports sustainability

In this scenario, a number of severe environmental collapses (droughts, food scarcity and renewable resource collapse) provide the incentive for both developed and developing global powers to begin to cooperate. A new commitment to green and equitable growth is shared globally, and for the most part, is characteristic of multilateral institutions, firms, states and individuals. Industrial best practices are determined according to sustainability criteria, and are diffused within sectors as firms seek to improve upon each other's processes and share results via open innovation. There remains robust global competition in clean technologies whose value propositions consider both upstream and downstream impacts.

Collective action is taking a number of forms, and is well-coordinated and supported by governments, non-government organizations and individuals. Governments among others are taking into account short-, medium- and longer-term policy objectives that better integrate economic, social and environmental goals.

This world is not without its challenges, however. Although there are systematic and global responses to many trans-boundary issues, environmental decline is still occurring, although at a slower rate. The climate is still changing. The policy landscape is also in flux, as new measures, such as natural capital valuation, become standard practice. Increased consistency in accounting for the triple-bottom line results in a fundamental shift in corporate and consumer values – the desire to buy green products is mainstreamed.

The role of governments is changing as they adopt the role of overseer of producer/sectoral sustainability claims. This is particularly important, given the increasing number of global product and process certifications based on tested methodologies. Collaboration among actors is high, and carrots and sticks are strategically applied to achieve policy objectives, following well-informed deliberation by policy-makers. Governments are also looking at reforming taxation systems – rather than taxing investment, economic growth and employment, the shift to fiscal instruments to support efficiency gains has seriously begun. Multilateral institutions are playing an important coordinating role in increasing the availability of credible information. Capital markets are requiring this information in advance of investment decisions and are requiring third party or government verification of claims and accounts.

There are winners and losers on the natural resource and energy fronts because of robust global competition in clean technologies, in combination with a decline in the use of higher polluting energy sources (supported by a well functioning global carbon market). There is a strong push for open innovation, which is somewhat at odds with the need to continue to motivate the identification of technological solutions.

Global population growth is slowing as conditions improve in developing countries – in fact, the first steps toward stabilizing populations are being taken in least developed economies.

Some News Headlines from 2025

- **World body reaches consensus on global carbon deal: "The time has come"**
- **West Africa becomes the breadbasket of the continent**
- **Green choices are the new affordable choice; hybrid cars drop to mainstream prices**

Annex B – The Foresight Study Participants

This foresight study has benefited from the contributions of many experts.

The following experts were interviewed by Horizons.

	Interviewee	Organization	Date of Interview
1	Stewart Elgie – Chair	Sustainable Prosperity	July 26, 2011
2	Ed Whittingham – Executive Director	Pembina Institute	June 30, 2011
3	Michael Jantzi – Chief Executive Officer	Jantzi Sustainalytics	July 22, 2011
4	Tima Bansal – Professor and Executive Director	Richard Ivey School of Business - Network for Business Sustainability	July 20, 2011
5	John Dillon – Vice President, Policy and Corporate Counsel	Canadian Council of Chief Executives	July 13, 2011
6	Robert Slater – Interim Chairperson	National Roundtable on the Environment and the Economy	July 15, 2011
7	Scott Vaughan - Commissioner	Environment and Sustainable Development	July 18, 2011
8	Joanne Gelinas – Lead on CSR/Sustainability Practices	Deloitte LLC	July 5, 2011
9	Signi Schneider – Chief CSR Advisor	Export Development Canada	July 18, 2011
10	Glen Hodgson – President and CEO	Conference Board of Canada	July 18, 2011

Horizons' Competitiveness and Environment Foresight Group was a collaborative, inter-departmental exercise that engaged invited experts from federal departments and agencies. Four group scanning events were held in May 2011. The exercises identified and challenged assumptions about the future and developed plausible scenarios. The departments and agencies included Transport Canada, Treasury Board Secretariat, Environment Canada, Natural Resources Canada, Agriculture and Agri-Food Canada, Fisheries and Ocean Canada, Foreign Affairs and International Trade, Indian and Northern Affairs Canada, Infrastructure Canada, Canada Economic Development for Quebec Regions, and Health Canada.

Notes

[1]Bowles, Stefanie. 2011. *Whose Logo? Sustainable Consumption and Production in North America*. Policy Research Initiative.
[2] Porter, M E. 2010."Reflections on a Hypothesis: Lessons for Policy, Research and Corporate Practice." Keynote address at the Sustainable Prosperity and Resources for the Future event *The Porter Hypothesis at 20*.
[3] Please see the Conference Board of Canada's *How Canada Performs 2011*: "Economic sustainability is defined here as a country's ability to sustain its economic growth and prosperity into the future. There are several facets of economic sustainability: economic growth**,** macroeconomic stability**,** and global integration." Environmental sustainability is not reflected in this definition, accessed August 29, 2011. Also see the World Economic Forum's 12 Pillars of Competitiveness, as elucidated in their *2010 Global Competitiveness Report*, accessed August 29, 2011. Note that a lack of comparable metrics that include environmental sustainability was repeatedly identified as a concern throughout our foresight study process, at the organizational level and at the national level (please see our foresight study on Well-being).
[4] Statistics Canada. 2008. Human Activity and the Environment: Annual Statistics: Climate Change in Canada, accessed April 28, 2011. IPCC, 2007: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning (eds.)]. Cited in: Environmental Protection Agency, Future Temperature Changes. The Earth's Commitment to Warming, accessed August 11, 2011.
[5] European Environment Agency. 2010. "Increasing Global Pollution Load: Global Mega-Trend 10". *The European Environment: State and Outlook 2010 – Assessment of Global Megatrends*. Published November 28, 2010, accessed August 27, 2011.
[6] Young & Rubicam. 2011. BrandAsset Valuator data, cited in Gerzema, J. and Michael Antonio. "The Power of the Post-Recession Consumer." *Strategy + Business*. Issue 62, accessed August 27, 2011. Young & Rubicam's BrandAsset Valuator (BAV) is a poll of consumer values, attitudes, and shopping behaviors. The BAV holds data on more than 40,000 brands in more than 50 countries, and every quarter it is supplemented with new results from 16,000 respondents in the US alone.
[7] Walmart. 2009. "Supplier Sustainability Assessment: 15 Questions for Suppliers."accessed August 27, 2001.
[8] The statistics in this section were compiled from the UN Population Division, Press Release. 2011. "World Population to reach 10 billion by 2100 if Fertility in all Countries Converges to Replacement Level", National Institute on Aging, National Institute of Health, US Department of State. *Why Population Aging Matters: A Global Perspective*. March 2007.

Fertility is a key leverage point. Small variations in fertility can produce major differences in the size of populations over the long run. The high projection variant, whose fertility is just half a child above that in the medium variant, produces a world population of 10.6 billion in 2050 and 15.8 billion in 2100. The low variant, whose fertility remains half a child below that of the medium, produces a population that reaches 8.1 billion in 2050 and declines towards the second half of this century to reach 6.2 billion in 2100.

[9] IMF. 2010. World Economic Outlook 2010 database. accessed August 29, 2011. Quoted in European Environment Agency. *The European Environment: State and Outlook 2010 – Assessment of Global Megatrends*. Published November 28, 2010, last accessed August 27, 2011. From the report: "ASEAN is a geopolitical and economic organisation in South East Asia comprising 10 countries, economically dominated by Indonesia, which accounts for about a third of its combined GDP. ASEAN has established free trade agreements with China, South Korea, and Japan (ASEAN plus three) and in 2003 the goal was set to create an ASEAN Economic Community by 2020. Parallel to this, regional cooperation has progressed in south Asia and the Gulf region and in 2002 the Asia Cooperation Dialogue (ACD) was created to promote Asian cooperation at a continental level with the ultimate goal of transforming the continent into an Asian economic community." (pg. 56)
[10] PBL Netherlands Environmental Assessment Agency. 2008. *Background report to the OECD Environmental Outlook to 2030, Overviews, details, and methodology of model-based analysis*, Netherlands Environmental Assessment Agency and Organisation for Economic Co-operation and Development, accessed 10 October 2010. Quoted in European Environment Agency. *The European Environment: State and Outlook 2010 – Assessment of Global Megatrends*. Published November 28, 2010, accessed August 27, 2011.
[11] Kugelman, M. and Susan L. Levenstein (eds.). 2009. *Land Grab? Race for the World's Farmland*. Woodrow Wilson International Center for Scholars, Asia Program, accessed August 29, 2011. Also see: Lorenzo, C. Land deals in Africa: What is in the contracts? International Institute for Environment and Development, accessed August 29, 2011.
[12] For a review of the OECD's work on green growth.

[13] For a review of resilience in complexity, please see Thomas Homer-Dixon's Manion Lecture, May 5, 2010. National Arts Centre, Ottawa.

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