

**Exploring  
Sustainable  
Development**

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# Exploring Sustainable Development

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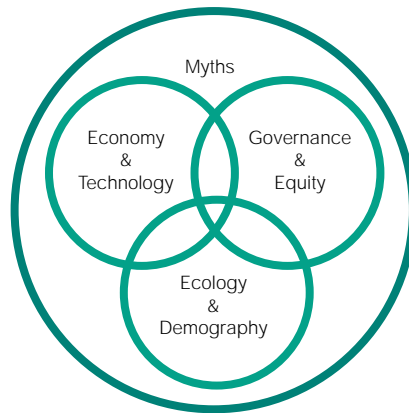
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# Foreword

"Sustainability," or "sustainable development," is a topic of our age and by its nature is ambiguous and elusive. As our extensive interviews showed, many can be emotional about the subject without fully defining what it is. We need not be ashamed of this, for to explore sustainability at this juncture in human history is to raise fundamental questions of how humanity defines itself and how each one of us comes to terms with the challenges of the 21st century.

We started with the Brundtland Commission's definition of sustainable development: "Humanity has the ability to make development sustainable—to ensure that it meets the needs of the present without compromising the ability of

## Sustainability Domains



future generations to meet their own needs." Our own explorations of sustainability identified these major components: economy and technology; ecology and demography; and governance and equity. These components we saw as being embedded in the prevailing myths—those deep premises about how the world works, which we take for

granted. In industrial and trading societies the economic myth of self-interest dominates. We have built scenarios to illustrate a number of plausible routes forward that pose challenges for business.

Scenarios do not claim to be, and are not, value free. They recognise that we

are prisoners of our own mindsets and language, and that understanding can be furthered with a new word or image, and especially a new story. We know our successors will have a richer language to discuss sustainability, and our task is to shine a light in their direction.

I believe that sustainability recognises that individuals want it all: human dignity; prosperity; and care for the planet. People are no longer happy with tradeoffs; they demand to know how you are going to deliver their wishes. So, much is asked of business in this area. If business can respond to people's needs with humanity and responsibility, it can shape the world of the 21st century.

This brochure contains an outline of the WBCSD Global Scenarios. We have dedicated the scenarios to those who wish to explore the future and challenge their understanding of how the world might unfold. We recognise that ecosystems are complex and not well understood; we have *fuzzy* limits to growth. But we know that the real limits to growth lie inside us, not outside; and that we cannot be fully human without being sensitive to the needs of the planet—the home of those to come.

Ged Davis  
Director, WBCSD Global Scenarios Project  
London, November 1997



## **Scenarios — Thinking and Acting on the Future**

Scenarios are powerful tools for addressing what is both fundamentally significant and profoundly unknowable—the future. Unlike forecasts, which impose patterns extrapolated from the past onto the future, scenarios are plausible, pertinent, alternative stories that are concerned more with strategic thinking than with strategic planning, and more specifically with the quality of that thinking. As we enter these alternative stories, we are guided to practice a flexible approach to the future and to alter our mental maps. Scenarios attempt to look beyond our more limited mind-sets, recognising that possibilities are influenced by a wide range of people and that many views of the world are different from our own.

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### **Building Scenarios**

The construction of scenarios for an organisation requires clarity about the overall focus or theme. This clarity arises from an appreciation of the users' mental maps and the current strategic agenda.

When the focus or theme has been clarified, the main areas of required research are identified, and information gathered. At this stage, participants need to be far-ranging, deliberately taking in a wide range of views so as to construct a basis for creative thinking, and to get "outside the box."

The next step is to identify and analyse driving forces that will shape the environment. What will persist and can be forecast (for example, demography in

many exercises), and what may change and is unknown? Following the identification of the driving forces, we can now contemplate a set of plausible storylines. These will need to be structured, the relevant interconnections identified, and the scenario logics, including discontinuities, defined. The scenarios are then usable as new frames of reference.

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### **Using Scenarios**

Scenarios have many applications:

- to enrich debate and widen the "strategic conversation" in the organisation. The aim here is to bring new concepts and understanding to users, and, ultimately, to change mental maps.
  - to search for corporate resilience, including making risky decisions more transparent. This involves identification of threats and opportunities and the creation and assessment of options.
  - to trigger a formal strategic planning process, including the assessment of existing strategies and plans.
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### **Bringing Scenarios to the Business**

Following the production of these global scenarios, the next step is the building of focused industry or corporate scenarios. This is just the start, for a good set of scenarios is only the foundation—but a significant foundation—for customised strategy development in an organisation.



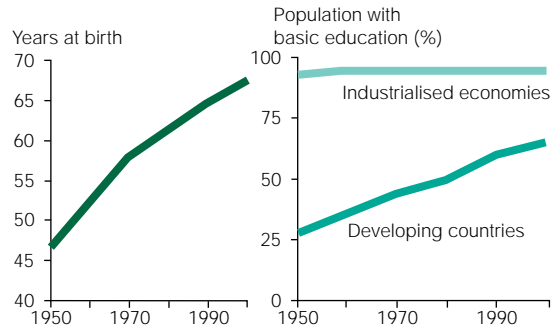
# The Challenge of Sustainable Development

The last 50 years have seen extraordinary growth in world prosperity. Even though population has more than doubled, global per capita income has almost

tripled. Most of us live longer and are better educated and fed than our parents or grandparents. In addition, the rate of population growth is slowing.

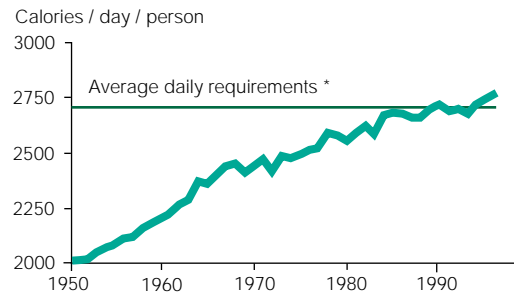
Economic success has carried with it a heavy burden on the environment and the quality of life—a burden that is increasing as many formerly underdeveloped parts of the world choose to follow the route of the more prosperous and demand their share of the earth's resources. Global warming, reduction in the ozone layer, resource depletion (especially

## Life Expectancy and Education



Source: World Resources Institute, 1996

## Global Food Production



\* Average of FAO estimates of daily calorie requirements per person

Source: FAO, World Food Survey, 1996

**State of the World  
Environment  
1950-1997**

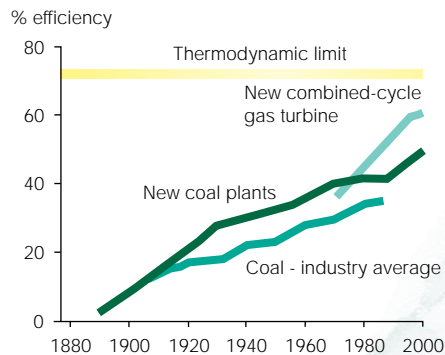
	<b>1950</b>	<b>1972</b>	<b>1997</b>
1. Population	2.5	3.8	5.8
2. Megacities	2	9	25
3. Food	1980	2450	2770
4. Fisheries	19	58	91
5. Water Use	1300	2600	4200
6. Rainforest Cover	100	85	70
7. Elephants	6.0	2.0	0.6
8. CO <sub>2</sub> Emissions	1.6	4.9	7.0
9. Ozone Layer	–	1.4	3.0

**Key**

- 1. billion persons
- 2. cities with population greater than 8 million
- 3. average daily food production in calories / capita
- 4. annual fish catch in million tons
- 5. annual water use in cubic kilometres
- 6. index of forest cover, 1950=100
- 7. million animals
- 8. annual CO<sub>2</sub> emissions in billion tons of carbon
- 9. atmospheric concentration of CFCs in parts / billion

Source: World Resources Institute, 1996

**Efficiency of  
Electricity  
Generation**



fresh water, fisheries, and top-soil), loss of rainforests and the accompanying reduction in biodiversity, the pressures of urbanisation, and the rapid growth in infrastructure systems—all these are increasing the stress on the biosphere, leading many people to conclude that we will reach the limits of the earth's capacity to carry these burdens in the next 50 years.

Others argue that the state of the environment isn't all that bad. Air pollution in some of the world's major urban areas has been greatly reduced. Moreover, the increase in efficiency that has come from new developments in technology offers hope that we can solve the problems that face us. But

we have no reason to be complacent. History informs us that diffusion of technology is a time-consuming process, and that we may take up to a half



### **Ten Global Threats to Ecosystem Viability**

1. ***Loss of crop and grazing land*** due to erosion, desertification, conversion of land to non-farm uses, and other factors—currently totalling a loss of about 20 million hectares a year.
2. ***Depletion of the world's tropical forests***, leading to loss of resources, soil erosion, flooding, and loss of biodiversity—currently at a rate of about 10 million hectares a year.
3. ***Extinction of species***, principally from the global loss of habitat, and the associated loss of genetic diversity—currently over 1000 plant and animal species becoming extinct each year.
4. ***Rapid population growth***.
5. ***Shortages of fresh water resources***.
6. ***Overfishing, habitat destruction, and pollution in the marine environment***—25 of the world's most valuable fisheries are already seriously depleted due to overfishing.
7. ***Threats to human health*** from mismanagement of pesticides and hazardous substances, and from waterborne pathogens.
8. ***Climate change*** probably related to increasing concentrations of greenhouse gases in the atmosphere.
9. ***Acid rain*** and, more generally, the effects of a complex mix of air pollutants on fisheries, forests, and crops.
10. ***Pressures on energy resources***, including shortages of fuelwood.

century to incorporate major technological changes into basic systems such as agriculture, energy, and transport. Our capacity to absorb new technology may depend less on its availability than on our ability to appreciate its importance and the willingness of society to entertain a change of mind. In many cases, only the synergy of a number of technological developments, together with social learning, allows new opportunities to be seized.

Technology and economic success can change the nature of risk for individuals and societies. But sustainable development is concerned with more than the management of man-made environmental vulnerabilities. We must not only balance present and future prosperity, but we must also ensure a measure of social equity for all. Our inability to do so may lead to the misery of war and social conflict. It is here we look to enlightened governance to ensure that human ingenuity can be focused on creation rather than destruction.

We are dealing with complex human and ecological systems over long time-frames. Whatever we think about where we are in relation to the critical thresholds of the earth's carrying capacity, the simple truth is: *no one knows*. While we know a great deal about many aspects of our environment, we don't know enough about the limits. We know about the toxicity of many chemicals but much less about their interactions; we don't know how much solid waste, CO<sub>2</sub>, and other wastes the natural systems can absorb; we don't know what would constitute sustainable yields of fish; we don't know what level of vegetation is needed for life support; we don't know how much biodiversity is required to maintain robustness; we don't know how all these ecosystems interact with one

another; and, most important, we don't know how human beings will respond to the challenges that face them.

Our ignorance makes interpretation difficult and can be a cause of inaction. What, for

**“How many people is the earth able to sustain? The question is incomplete as it stands. One must modify the question by asking further: At what level of technology? And modify it still further by asking: At what level of human dignity?”** - *Isaac Asimov*

example, is the extent of the gap between rich and poor that healthy societies can sustain? Are the environmental issues we focus on early indications of global trends, or are they local failures to be expected in a turbulent world? Which will be the most significant in the long run, and which are only of temporal or regional importance? Because of the potential enormity of the problems we face, and because of our ignorance about the very conditions for our survival on the earth, many are tempted to keep on doing "business as usual" and hope for the best. But we can't wait until we know absolutely before we begin to act, because inaction may have extremely serious consequences.

We can summarise the key uncertainties we face as follows:

1. What are the critical thresholds in soil, air, climate, water, and biodiversity, and how do we recognise these limits? How resilient is the global ecosystem?
2. What human social systems can best respond to the challenge of sustainable development?

Since we don't know the answers to these questions, how can we respond? How can we make decisions in a context that is both extremely important and deeply uncertain—and that carries such profound risk?

Scenarios, such as those presented here, are designed to help us explore these uncertainties and to enable a response—allowing us to face, with imagination and boldness, the challenge of sustainable development.



**The New,  
The Many,  
The Connected**



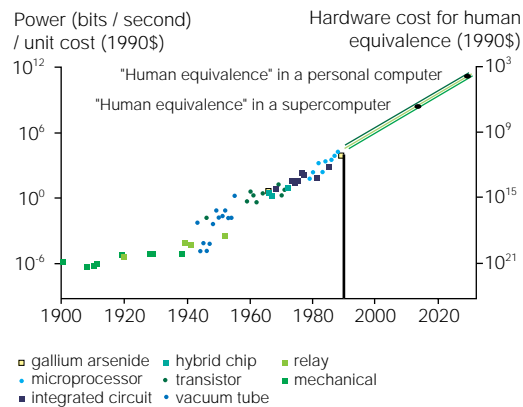
# The New, The Many, The Connected

Of the many possible scenarios that could be constructed in response to the challenge of sustainable development, all begin with three pre-determined elements: the new, the many, and the connected. These are the driving forces that shape the global business environment and that will persist in any scenario. They form the common starting point from which the three stories emerge—and then diverge.

## The New

Social and technological innovations lead to many new products and processes, and these will inevitably affect sustainability. Biotechnology, for example, offers an astonishing array of new opportunities and ethical choices. The Grameen Bank, which pioneered micro-credit agencies in Bangladesh,

### The Next Era of Computing



promises to have as great an impact on people's lives there as any development in technology. Even more, the synergy of these innovations interacting together will change our world in ways we can't predict. The information technology revolution, a driver of

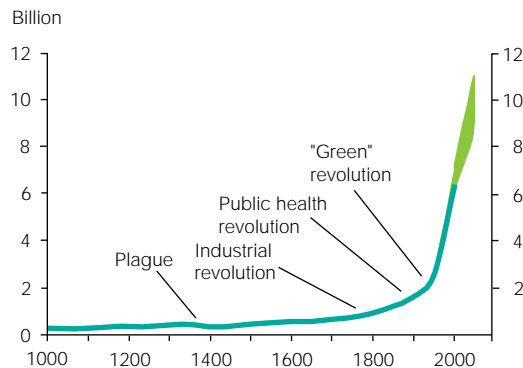
what is often called the "fifth wave" of technology, is only in its very beginnings.

In addition to social and technological innovations, another important area of *the new* concerns the economy, which has an increasing number of new players—new countries entering the global trading regime; new businesses; new partnerships among established businesses; non-governmental organisations (NGOs), which will assume a greater role in public debate and decision-making; the media, with its enormous power to sway public opinion, especially where emotions are high; and the unpredictable outcomes arising from many of these players interacting together in new ways.

Finally, we are at an essentially new moment in human history. For the first time, we are widely aware that our day-to-day decisions have the power to destroy our own habitat, the earth.

## The Many

### World Population 1000-2050



Source: United Nations

In the next 50 years, population will increase from 6 billion today to 9-11 billion. Material consumption will grow substantially, putting an enormous additional strain on already stressed ecosystems. This increase in people is accompanied by an increase in the diversity of the actors who influence how our societies and economies are shaped and what decisions we make.

## **The Connected**

We are connected more closely and in more ways than we had previously realised, both to our fellow human beings and to the environment of which we are a part. As the power of our technology grows, as our communication infrastructure develops, and as our economic systems become more inter-dependent, we are creating a global "technosphere" to rival the global ecosystem. Its components are linked together in a myriad of different inter-connections, so that what happens in any one area has the potential to affect many others. At the same time, this technosphere relies completely on the global ecosystem to provide the natural resources it uses and the sinks for the wastes that it produces.

The extent of our inter-connectedness has changed the speed with which knowledge is transferred and problems are perceived—but not the speed with which these problems are solved. Social decisions are mediated by institutions that were designed for a slower, more methodical approach to solving problems, and these problems were assumed to come one by one. Now our problems seem baffling in their interlinked complexity, and the slow and insufficient response of our institutions leaves many people feeling frustrated and disillusioned.

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## **Three Scenarios**

Three scenarios have been developed to explore possible responses to the challenge of sustainable development. These responses arise from habitual patterns of thinking that form who we are, whether or not we are conscious of them. Such patterns—or "myths"—shape what we think is possible or real, and how we talk to one another about the crises and opportunities that face us.

**The Myths That Have Made Us**

**The Economic Myth**





*“ Myth”—a belief or a subject of belief whose truth is accepted uncritically.*

The hidden infrastructure of the world is the economic myth. We live in it without thinking of it as a “myth” in the common sense of the word—something fabricated. We accept its truth uncritically. We see the history of the world as an economic history, not as the march of great men across a stage (hero myth), or as the working out of the plans of God (religious myth). Nor is society held together by a belief in the perfectability of human systems based on reason, which arises from the democratic/scientific myth.

Whatever form the economic myth takes, it displays three characteristics: its ideal is growth; it is a horizontal, not a vertical myth (that is, it counts rather than evaluates); and its medium is numbers and pictures—a medium which, lacking the barrier of language, may explain why it is the first truly global myth. While this myth has many strengths, its dominance has threatened the values embodied in earlier myths.

The myths that shape us cannot be artificially created; they have to arise naturally, over time. That means that we have to learn all we can about the economic myth--what it fosters, what it threatens, and what it allows as new

possibilities. The stories we tell within it about who we are and what is possible will create the future. If we choose, we can declare the discovery of a new world—that blue pearl of the earth as photographed from space, the first view of the whole we’ve ever seen. This image suggests a story about self-interest, the driving force of the economic myth, that is more complex and interconnected than any story we’ve ever told before.

	Hero	Religious	Democratic/ Scientific	Economic
Ideal	Excellence	Goodness	Truth	Growth
Behaviour	Competition	Obedience	Reason	Maximising advantage
Actors	Heroes	Saints Prophets	Philosophers Scientists	Consumers Business
Communication	Stories	Scripture Prayers	Logical arguments Mathematics	Images Numbers
				

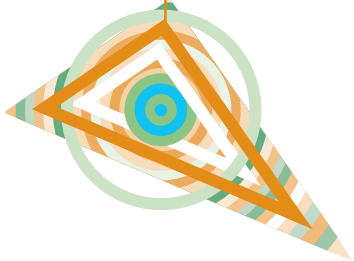
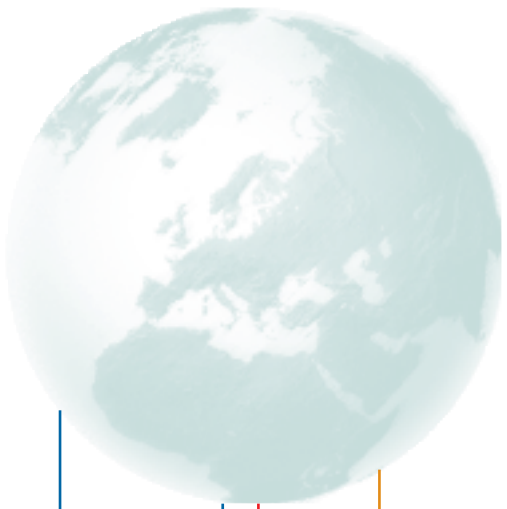
M = Man  
G = God  
N = Nature

*\*The triangles suggest which element takes precedence (the top of the triangle) and which relationships are most significant (the shaded band).*



Thus, the point of divergence from what all the stories have in common—the new, the many, the connected—arises when human actors respond in varying ways to the challenge of sustainable development. This variation in human response means that the branching point of the scenarios—what differentiates them from one another—lies not so much in the ecosystem or in the social system, but with us.

Will we simply ignore our social and environmental problems, trusting in the dynamic of economic growth and the innovations of technology, as people do in the **FROG!** story? Or, when problems reach a crisis point, will we turn away from our ineffective institutions of government and business to seek new models of governance—a **GEOpolity**—that will take into account the religious and democratic values our narrow economic myth seems to ignore? Or will we try to embody our growing environmental and social values within the economic myth?—and, like **Jazz** players, experiment with ad hoc alliances and innovative forms in a world where the way we "play" and everything else we do is open for everyone to see and judge.



## **The Scenarios**

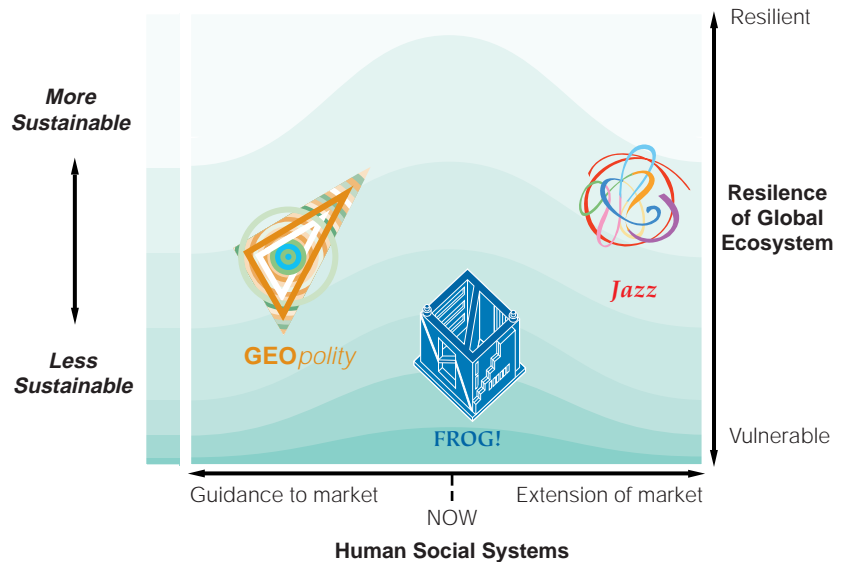
# Exploring Sustainable Deve

## The Challenge of Sustainable Development

- What are the critical thresholds in soil, air, climate, water, and biodiversity, and how do we recognise these limits? How resilient is the global ecosystem?
- What human social systems can best respond to the challenge of sustainable development?

The two questions are explored in different ways in the scenarios. In **FROG!** the response is inadequate—the human social systems are unable to meet the challenge of sustainable development, a challenge made more difficult by a vulnerable natural system. In **GEOpolity** the response is to build an interlocking governance structure coordinated at the international level. In **Jazz** markets are harnessed for finding solutions to sustainable development.

## Scenario Dimensions

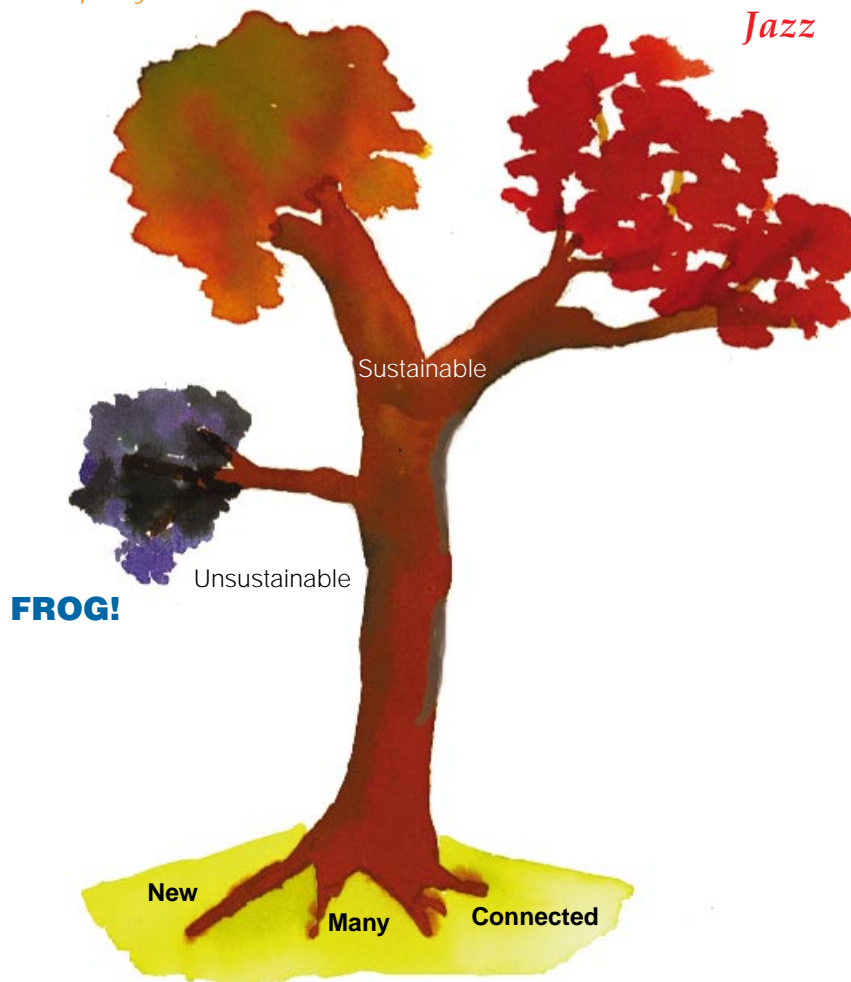


# Development—Global Scenarios

## Branching Points

**GEO***polity*

*Jazz*



# F R O G !

The world of **FROG!** is a familiar world—at least at first. Many nations experience a fair degree of economic success, and, for almost all, economic growth is the major concern, with sustainable development acknowledged to be important, but not pressing. As environmental NGOs continue to demand enforcement of standards that have been set in global summits, those nations who are striving to develop argue that if the developed nations insist on raising environmental standards, they should “**F**irst **R**aise **O**ur **G**rowth!” Indeed, in this scenario, some nations leapfrog from underdeveloped status to benchmarker in particular areas of technology. People in western nations respond in uneven ways—sometimes by offering help in improving the environment, and sometimes in raising various cries

“To get rich is glorious.”

– Deng Xiaoping

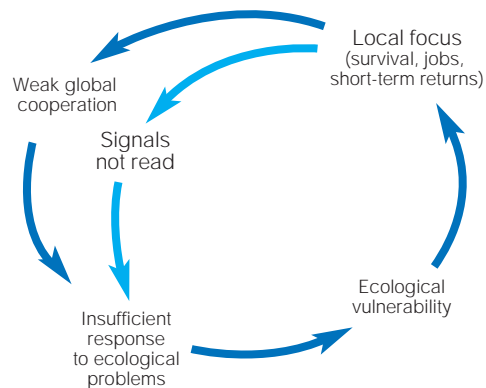
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nations leapfrog from underdeveloped status to benchmarker in particular areas of technology. People in western nations respond in uneven ways—sometimes by offering help in improving the environment, and sometimes in raising various cries

of “**FROG!**” themselves, especially in response to perceived threats from underdeveloped nations in the areas of employment and copyright and patent infringement.

People value sustainable development in the **FROG!**

## Dynamics of **FROG!**





scenario—but it is not top priority. In addition, in the early years, environmental health in many areas improves significantly. The improvement in local air quality, solid waste management, and environmental education leads to a perception that the environment is in much better shape than it was in the late 1990s. But at the global level, the picture is less clear. With economic growth and the increase in population, greenhouse gases are rising, unnoticed by most. The signals are difficult to read, and people disagree about what they mean—both the difficulty and the disagreement are good reasons, it is felt, to continue to “**F**irst **R**aise **O**ur **G**rowth!” But, by 2050 there is evidence that the darkest predictions about global warming are actually nearer to the truth than the more optimistic ones.

In **FROG!**, the habitual reliance on technology has not been sufficient to solve longer-term problems of either environmental or social health. Globalisation and liberalisation of markets along with the pressures of rapid urbanisation have raised the degree of social inequity and unrest to a level that threatens basic survival of both human and environmental ecosystems.

**“We learn geology the day after the earthquake.”**

– *Ralph Waldo Emerson*

In this scenario, people react like the proverbial frog: when placed in boiling water, the frog leaped out of danger; but placed in cold water that was gradually heated to the boiling point, the complacent frog was boiled to death.

# GEO*polity*



**GEO*polity*** begins with a succession of signals in the first two decades—some real, some imagined—that an environmental and social crisis looms. The prevailing "economic myth" is increasingly viewed as dangerously narrow. This is particularly true in Asia, where rapid economic growth has meant that corners have been cut and traditions lost. Because many institutions, especially governments, have lost credibility as problem-solvers, people expect something from the new centres of power—multinationals. But the business sector seems

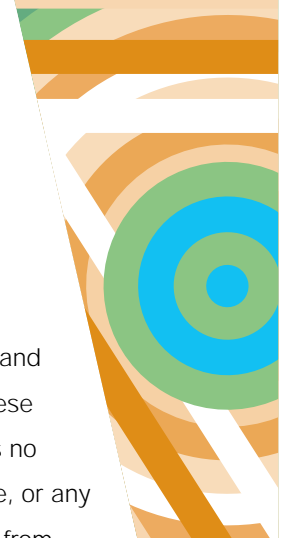
**“The hallmark of our age is the tension between related aspirations and sluggish institutions.”**

– *John Gardner*

unable or unwilling to respond adequately. Business is distrusted, and in some cases, because of its prevailing focus on narrow self-interest, is even perceived to be hindering solutions to problems. Its actions are not coordinated on a global level, and it seems to lack the

will even to address the problems.

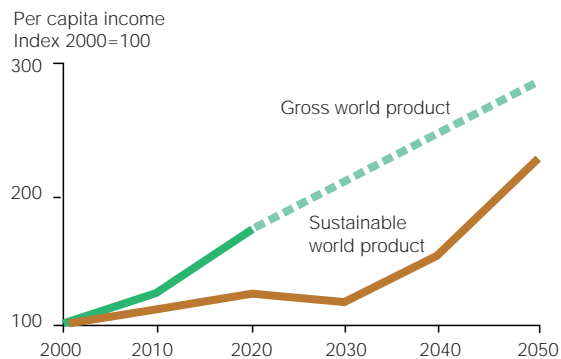
Because neither governments nor businesses are effective in providing leadership, people begin to look for new leaders and to demand new social institutions. Some of these involve the strengthening of government—for example, "sustainable cities," "sustainable national accounting," and comprehensive implementation of industrial ecology. Others are politically innovative. The perceived need for strong and certain responses leads to a new global consensus that welcomes technocratic solutions, sanctions, and more direct



control of the market to ensure that environmental values and social cohesion are preserved. The impetus behind all these movements is the growing consensus that the market has no inherent incentives to protect the commons, social welfare, or any other non-economic values. In the absence of leadership from business and government to solve problems, people form new global institutions—such as the Global Ecosystem Organisation (GEO), which has broad powers to design and enforce global standards and measures to protect the environment and preserve society—even if doing so requires economic sacrifice.

In **Geopolity**, governments are rejuvenated as focal points of civil society.

### Indicators of Development



Governments seek to work with markets rather than to displace them. But they take the lead in shifting the structure of the economy towards sustainable development in conjunction with institutions such as GEO.





# Jazz

In the world of **Jazz**, diverse players join in ad hoc alliances to solve social and environmental problems in the most pragmatic possible way. The key note of this scenario is *dynamic reciprocity*. This is a world of social and technological innovations, experimentation, rapid adaptation, much voluntary interconnectedness, and a powerful and ever-changing global market.

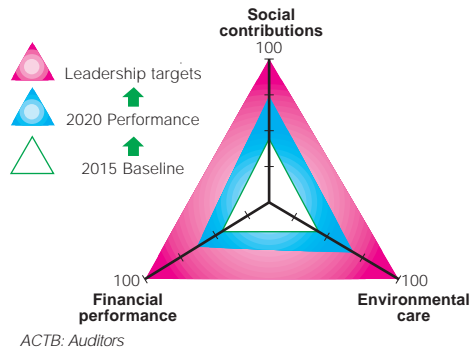
*“At the same time that jazz depends on the individual it also depends on cooperation.”*

– Martin Williams, *“The Jazz Tradition”*

What enables the quick learning and subsequent innovation in **Jazz** is high transparency—the widespread availability of information about ingredients of products, sources of inputs, company financial, environmental, and social data, government decision-making processes, and almost anything else concerned consumers want to know. Many players are involved, in part because the way information technology lowers barriers to entry allows new actors to step onto the economic stage. And that stage itself is characterised by a global free market, sound legal systems, and a respect for property rights.

To the extent that government is involved, it is most active at the local level, with ad hoc global institutions arising to solve particular problems. Agreements are reached through mediation in a world in which transparency is required, but particular “green” behaviours are not, even though such behaviours are rewarded. Achievement of the new environmental and social standards occurs

**Measures of  
Corporate  
Performance**



largely out of self-interest. The public is made aware of transgressions and quickly acts against companies or countries that violate standards. Companies have an interest in seeing that disputes do not escalate and indirectly harm them. They monitor relationships with customers and suppliers closely and drop risky partners quickly. In this highly competitive and interconnected world,

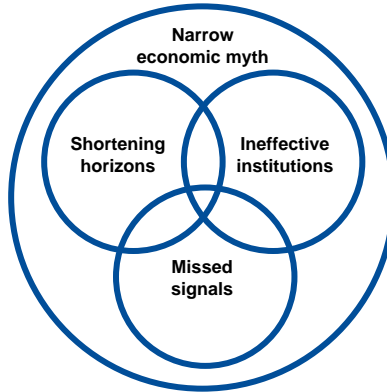
businesses see strategic economic advantages in being perceived as environmentally and socially responsible, and many become pro-active leaders in responding to social and environmental challenges.

**Jazz** is a world in which NGOs, governments,

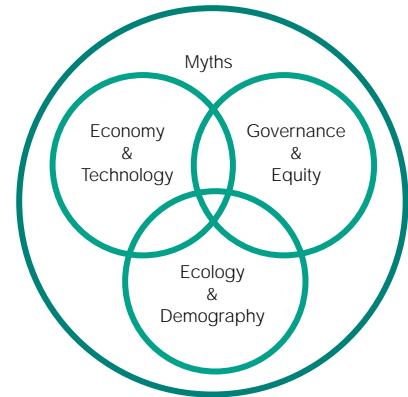
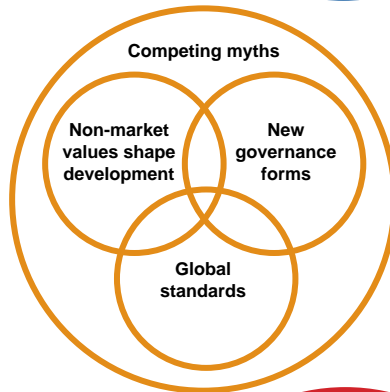
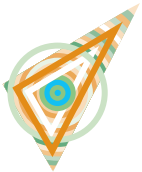
concerned consumers, and businesses act as partners—or fail. Together, along with other players, they learn effective ways of incorporating environmental and social values into market mechanisms.

# Sustainability Domains - Global Scenarios

**FROG!**



**GEO**polity



**Jazz**



# Business and Sustainable Development

## FROG!

**Challenge to Business:** clean your "spectacles"; make sure signals get through; learn from other people; take "social precautions."

**Lessons:** measurements for sustainability are needed and accepted globally; reading a broader set of signals is important (social and ecological, not just economic and financial); there is a lack of leadership and coordination between business and government; keep some institutions alive—preparedness, so that if you get a shock, you can deal with it; in a low-trust environment social costs could be shifted onto business; need to think "out of the box."

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## GEOpolity

**Challenge to Business:** contribute, and, where possible, shape the emerging debate on new institutions and rules for conduct in relation to environmental and social matters; move business into a position of influence.

**Lessons:** address your social license to operate; importance of understanding governments and new global institutions.

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## Jazz

**Challenge to Business:** become involved early on in working with various stakeholders to take on environmental and social matters as competitive issues, in an open and more transparent world.

**Lessons:** you cannot operate against the public good for long; importance of understanding the cross-fertilisation of technology; the "business of business is more than business."

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The scenarios are designed to stimulate broad discussion on the challenges of sustainable development for business and to provide a platform for more focused industry and corporate scenarios incorporating local business issues. These focused scenarios, in turn, will provide a useful stimulant for the review of existing strategies and the creation of new ones. We wish you success in the next step.

# Scenario Project Participants

## Participating Companies

3M Company	Novartis
ABB	Ontario Hydro
Anova Holdings AG	Philips Electronics NV
Avenor	PowerGen plc
BHP	Procter & Gamble Co.
British Petroleum Co. plc	SGS Societe Generale de Surveillance
Brodrene Hartmann A/S	Shell International B.V
Coors Brewing Co.	Sony International (Europe) GmbH
Dow Chemical Co.	Swiss Bank Corporation
General Motors Corporation	Tokyo Electric Power Co.
IBM Europe	TransAlta Corporation
Interface	Volkswagen
Johnson & Johnson	Waste Management Intl. plc
S C Johnson & Son Inc.	WBCSD
Monsanto	WMC Ltd.
Neste Oy	Weyerhaeuser Co.
Noranda Inc.	Xerox Corporation

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