Getting to a Sustainable 2050?

Difficult

(and maybe, just barely)

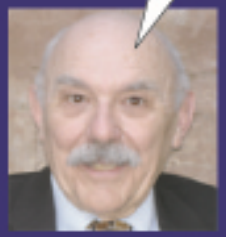
Possible

(with a little luck)

The World Business Council for Sustainable Development

Vision 2050 Project

Sometimes I receive a set of slides across the internet that I can't understand. I can't understand because they were meant to be accompanied by some explanation which the speaker gave at the time. To prevent this from happening with this talk, I decided to add some comments like this to indicate some of the things I said in the lecture. I hope it helps you understand my message a little better.



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Introducing myself...

Current:

- Visiting scholar, Stanford University (on and off for almost 2 decades)
- Distinguished Consulting Faculty, Saybrook Graduate School

Past:

- CEO, international consulting company (6 years in the 80s)
- CEO, R&D company (13 years in the 70s and early 80s)

Taught:

- Harvard, Columbia, Sheffield (U.K.), Catholic University

Selected projects:

- system for analyzing any complex subject matter (ACM Lifetime achievement award for this) mid-60s
- info-architect and manager of info-system for all Federal education and R&D programs (over 400) in late 60s
- director of evaluation of all simulations/games for education (over 1500 in 35 disciplines) in the 70s
- first explorer of integrated verbal-visual syntax and semantics of visual language (in the late 90s)
- originator of the Human Cognome Project (2001)

Currently:

- developing visual analytics and strategics for complex public policy projects and social messes with the International Futures Forum, various agencies of the U.S. and British governments, and companies

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What is this briefing about?

- A group of strategists from very large, global companies*

- took a hard look at the feasibility of the world achieving a sustainable 2050

- developed a set of requirements and success measures

- and outlined a pathway that suggests one way that seems possible to match these requirements

Here's the reason why I think it is worth your time to read through this briefing.

In my view, there is reason for considerable doubt as to whether the world will get to the year 2050 in sustainable shape. So, it is important to pay attention to any serious project that has examined these prospects, and especially one that provides a pathway to get to 2050 - sustainably.

* The World Business Council for Sustainable Development represents 200 major transnational corporations: 1/2 are Fortune 500s

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Why this project is important

In short, the WBCSD Vision 2050 project says about the future:

Challenges..... *huge*
Risks..... *high*
Vision 2050 .... *compelling*
Changes..... *urgent*
Pathway..... *feasible*
Actions..... *necessary*
Opportunities.. *many*
(for business)

The task force did not think it would be easy or without significant risks. What they did conclude was that the ***changes we need to make in the global economy, governance, and society are far more urgent and challenging than had been originally thought.***

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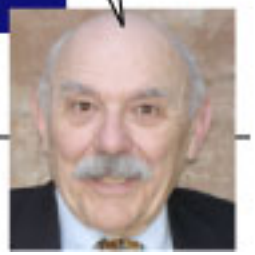
Tool for thinking comprehensively, flexibly & strategically

One of the products - an info-mural of how we can get to a sustainable 2050

What I created for the project as its synthesizer and visualizer is a large info-mural that measures approx. 4 feet by 14 feet (shown here). My job was to capture all of the vital elements that we must have to get to the Vision of 2050 that the project task force agreed upon. The mural contains the sequences of about ***400 individual requirements for achieving sustainability*** grouped roughly in the four decades leading up to 2050. These "idea chunks" enable us now to see a good bit of the whole picture. (There are a few notable missing elements, but these can be added this year.)

It provides a a ***tool for thinking*** comprehensively, flexibly, and most of all, ***strategically.***



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GOVERNANCE - Enable transformations in global economy and pla

Growing awareness of need to cooperate

Required to be on track for a sustainable 2050: **Major collection of international agreements on climate and energy**
Not necessarily treaties, but at minimum bilateral and multilateral agreements

Global Issues Networks

International governance begins to shift from treaties to cooperative issue networks and more frequent trust-building summits and mini-summits
Representatives from governments, NGOs, UN and business collaborate on issues

Big risk
International terrorism networks increase

Big risk
Massive rise of international drug and crime organizations

Probably necessary for scenario to be "on track" for 2050: **A more effective summit of the Major Economies begins to meet on a quarterly basis**
Discusses existing and potential global challenges including security. G8 plus outreach 5: Brazil, China, India, South Africa and Mexico plus Indonesia, Turkey, Egypt or Nigeria.

MAJOR ECONOMIES MEETING (MEM) summit meets often

PEOPLE: VALUES, BEHAVIOURS, AND DEVELOPMENT - Well on the

Eco-awareness spreads rapidly

Required to be on track for a sustainable 2050
Universal primary and secondary education has begun to shift fertility rates to around replacement levels. More women are educated and engaged in economic activities, leading to improved health of women and their children

Eco-aware consumers lead selection of products, services, and leisure activities based on efficiency, ecological and social impacts, reinforcement of individual work-life balance, community needs, and global resilience

Sometime during this decade
New "people and planet" movement leaders emerge.
Many societal actors take responsibility for deeper "ecological-awareness education" to encourage changes in perceptions and behaviour by the end of the decade. New measures of personal success beyond financial status become more popular

Sometime during this decade
Sometime during this decade The urgency and need for change is evident and is increasingly advocated by corporate and political leadership. It becomes clear that the best option is to work together to change the rules of the game, find new solutions, and evolve new ways of thinking, measuring and doing

Required to be
for a sustaina
Reproducti contracepti planning av virtually ev on the plan

AGRICULTURE - Feed 9 Billion People by 2050

Doubling & tripling of yields

Required to be on track for a sustainable 2050: **To feed 9 billion people by 2050, food, feed, fibre, and fuel output must increase two-fold, growing 2% annually without increasing the negative environmental impact and if possible not use any more land for agriculture.**

Assumption: Better use of freshwater. Most efficient way of increasing the efficiency of water use in agriculture is through increasing yields and requires extracting the maximum yield per drop.

Required to be on track for a sustainable 2050
Asian, Pacific water efficiency doubles

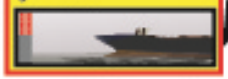
Russia & Ukraine triple wheat yield via professionalization of farming

With the successful completion of the WTO Doha round, large agricultural subsidies are discontinued boosting production in Latin America, Eastern Europe and Africa

2nd generation biofuels hit market.
Cellulosics converted into biofuels greatly improves fuel efficiency, frees up cropland, alleviates food/fuel conflict, and diversifies carbon footprint

Increasing knowledge in agriculture continuously optimizes input efficiency. Farmers manage the landscape, and need technical support, access to capital, access to markets and information to build capacity for higher productivity and natural resource efficiency. Wide acceptance of existing technology.

Required to be on track for a sustainable 2050 Freer trade in agricultural products, in order to maximize production of food and agricultural products on a global scale



Big
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FOREST - Sufficient timber and fuel for 9 billion people by 2050 wh

Global action on deforestation

Required to be on track for a sustainable 2050 **The United Nations Framework Convention on Climate Change (UNFCCC) releases the Reducing Emissions from Deforestation and forest Degradation (REDD) report. Without REDD, the 2 degree C climate stabilization goal will not be met**

REDD+

Carbon storage benefits of wood products are recognized in carbon markets

Approx. Amount of Carbon Stock in World Forests	Total carbon stock
Planted forest carbon stock	24 Gt
Primary forest carbon stock	162 Gt
Natural forest carbon stock	185 Gt

Total amount of carbon storage in wood products: 21 million tons

E.g. Global stock of carbon stored in wood in buildings, furniture, etc.

Probably necessary to be on track for a sustainable 2050
Commitments to deep carbon reductions by industrialized countries to create demand for REDD+ carbon credits.

REDD+ CO_2

REDD+ in Action

By the end of the decade **Major actions addressed by REDD+ begin to be implemented:**
- **Provide financial incentives to local people for conservation and expansion of ecosystem services from primary and modified natural forests.**
- **Procedures for setting emissions levels**
- **Methodologies for monitoring, reporting and verification**
- **Processes to promote the participation of indigenous peoples and local communities**

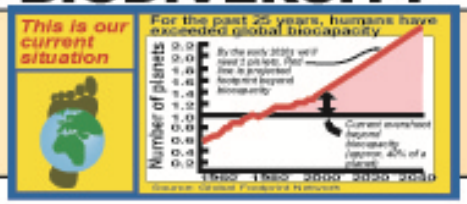
Increasing harvests from planted forests provide more forest products and biomass that can be used for production of carbon neutral fuels

ECOSYSTEMS & BIODIVERSITY - Maintain and r

Natural literacy spreads

This will take time, but is required to be on track for a sustainable 2050
Improved NATURAL LITERACY - Increased knowledge and attention on ecosystem services
A range of in-depth and comprehensive multi-year studies have deepened our understanding of the functioning of the full range of ecosystem services. Widespread media attention of such studies has contributed to a greater focus on the protection and enhancement of ecosystem services.

This is our current situation



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s increase the unities in and ar s to grow their rd biodiversity he kind of prot not provide al

It might be a good idea for me to zoom in on a part of this large mural just to give you a taste of what a visualized synthesis looks like. Here's part of the bottom left-hand side of the mural.

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Outline of this talk

- What is the World Business Council for Sustainable Development
- The project: Vision 2050 & my role
- Backcasting and the Pathways info-mural
- Accomplishments
- Info-murals as tools for thinking
- What next?

The main points I want to get across today are two:
1) An understanding of the project and what it tried to achieve, and
2) to introduce you to the Pathways mural as a tool for helping us think about these issues.

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Project Sponsor

World Business Council for Sustainable Development

WBCSD is a CEO-led coalition of 200 transnational companies

"The voice of global business on sustainable development"

The World Business Council for Sustainable Development was founded in 1992 during and after the Rio conference on climate change. It's global in nature and many of its member CEOs regularly show up for its meetings.

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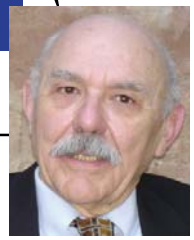

KEY QUESTIONS

- What would a vision of a sustainable future look like?
- What are the pathways and solutions for achieving sustainability? And what are the opportunities for business?
- What are the risks and dilemmas we must address to move forward?
- What are the robust actions, policies and investments to move rapidly to a sustainable pathway?
- What are the roles for business?

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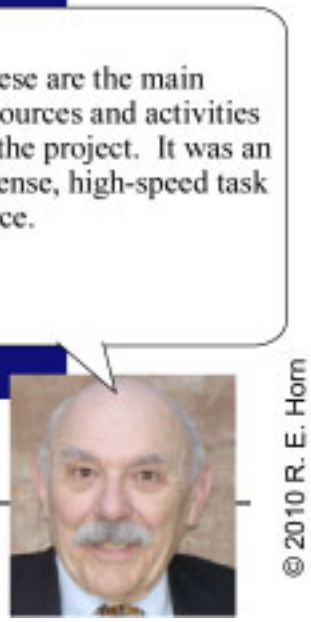
The Project Plan

- 29 companies on task force
- Objective: Develop a "big picture" tool for business thought, dialogue and strategy leadership

~ 40 people, each 40 days

- 18 months to complete
- 4 staff + 4 part-time contractors
- Occasional outside experts
- 5 task force meetings of 3-4 days each
- 4 subteams for backcasting



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The Vision for a Sustainable 2050

The task of the first workshop was to sketch out a set of assumptions and a vision of what a sustainable 2050 would look like. The team finally came up with five categories we would work with and 22 individual elements or specifications that provide some illustrative detail of a sustainable 2050 global society. I imagine you would agree with the aspirations of many of these elements. You may have some you'd like to add. These are the ones the task force could agree on. In the next few slides I'll show you each of the 5 categories without comment..

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9 billion people live well, and within the limits of the planet

The project after some discussion decided to accept the median United Nations Population estimate of around 9 billion people living on the planet. We then defined our task as characterizing how these 9 billion could live well within the limits of the planet. A big job.

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People are fairly healthy and public health systems are robust

More than 6 billion live in cities

The global population has begun to stabilize at around 9 billion

People

Most people can meet their basic human needs, including the need for dignified lives and meaningful roles in their communities. Living well within the realities of Nature has become a universal cultural norm

Living within the capacities of ecosystems

Success has been redefined – nationally and personally – as living well within one planet and has become a universal cultural norm

Universal education of both men and women through the secondary level enable diverse cultures to be aware of the realities of the planet

Security = adapting and changing rapidly in a fast-changing world.

People, companies & governments are forward-looking, problem solving, resilient & experimental

Here's what the group said about people in 2050.

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Ecosystems

Economic growth has been decoupled from ecosystem destruction and material consumption, and re-coupled to sustainable economic development and meeting needs

Oceans no longer treated as waste dumps but are cultivated and managed as significant ecosystems

Improvements to water, energy and agriculture help humanity remain within the carrying capacity of one planet

Ecosystems degradation has been reversed and ecosystem services are maintained and enhanced; biodiversity has been conserved and is prospering

The task force took for granted that the main purpose of this exercise was to make sure that human society had a sustainable ecosystem and that the rest of their deliberations had to assume this.

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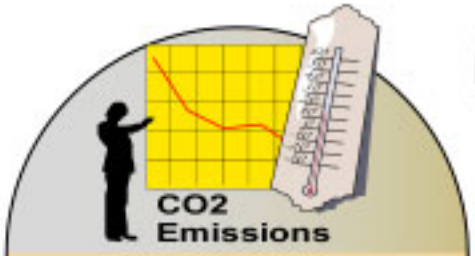
Energy and Resources

Energy and resource use have been transformed to meet the requirements of planetary replenishment and civilization's requirements

Energy and resources are used more efficiently, and harmful emissions have been significantly reduced

Circular, closed loop designs drive industry. The efficiency of materials use, including the management of waste and pollution, is many times greater than at the turn of the century



Global greenhouse gas emissions have been stabilized and may be on the way down as energy systems are starting to head toward net zero carbon

Human use of energy and resources are one of the major causes for the felt need to develop a vision and a way of accomplishing the vision.

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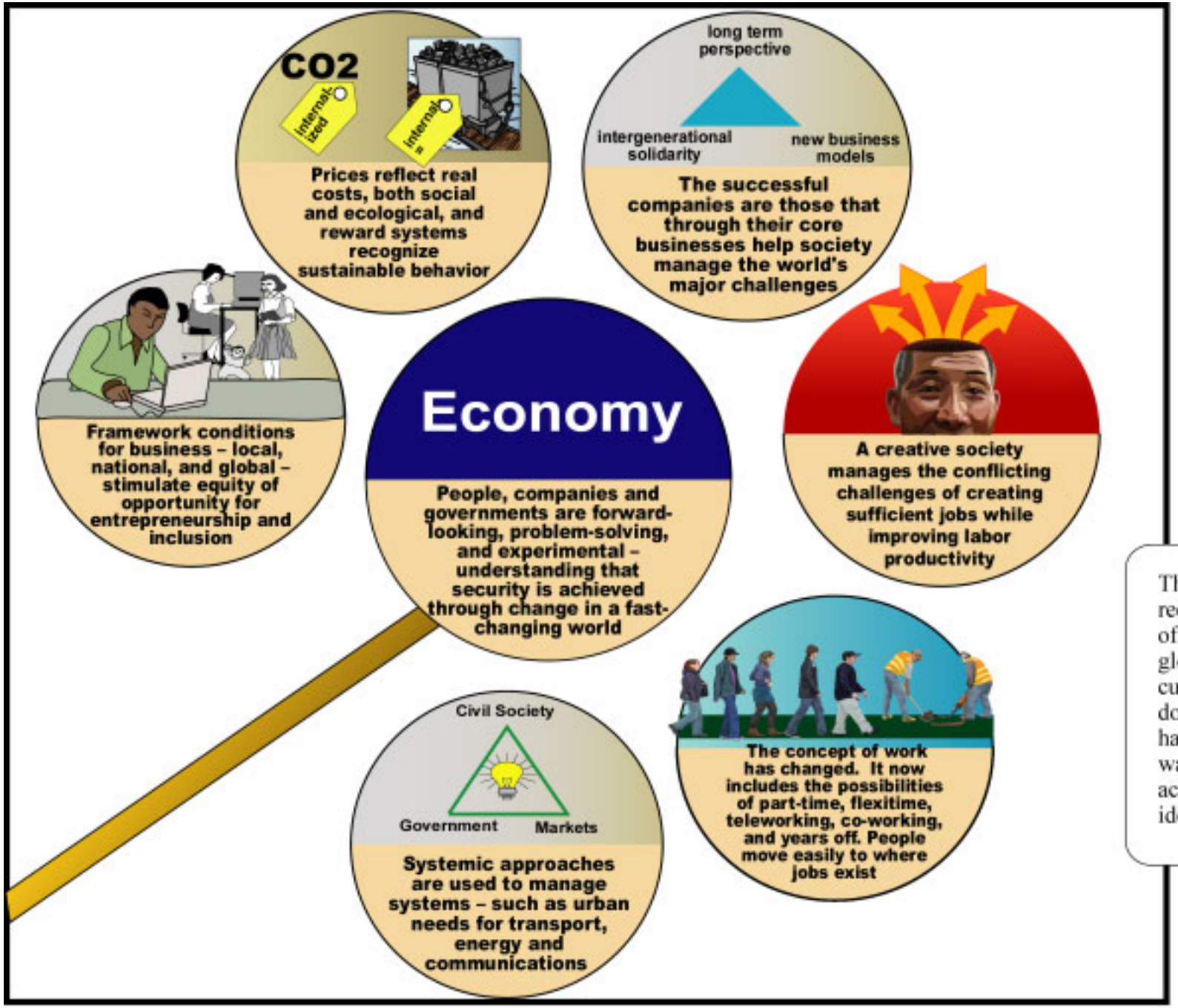

There was a clear recognition that many of the elements of the global economy and our customary ways of doing business would have to change in major ways for us to accomplish the other ideas in the vision.

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Governance

Governance systems skillfully practice subsidiarity through pooling sovereignty, cooperating effectively to manage global systems and issues: markets, disease, climate, water, fisheries, conflicts and commons

Governance is transparent, fair, and inclusive, enabling and guiding markets by clarifying limits and establishing frameworks

Much governance happens at city and regional levels and is efficiently connected to the wider world

Nations encourage local resilience, connecting neighborhoods to international organizations to manage adaptation to climate change and access to water and sanitation

There are conflicts, disasters, shocks, crime and terrorism, but resilient societies can withstand shocks and quickly recover

The other elements of the vision suggested that, if we are to accomplish the vision, our ways of governance would have to change as well - although the project did not devote as much time and effort to this aspect of the project.

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Step 2

BACKCASTING

- 4 sub-teams plus outside expertise
- Phase: several months
- Task: what must happen in each decade for the Vision to happen?
- Outcome: PATHWAYS MURAL
- My role: synthesizer, visualizer

The next phase of the project was to do what futurists call backcasting. Backcasting is starting at the outcome of some process and asking how do we get there? Starting with the Vision, the group asked ***what must be in place in each preceding decade back to the 2010s for the vision to be accomplished.*** They did this in 10 separate domains:

- energy
- mobility
- buildings and appliances
- materials
- food
- forests
- ecosystems and biodiversity
- governance
- economy
- people.

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The ten pathways

- Energy and power
- Buildings and appliances
- Mobility
- Materials and manufacturing
- Global economy, finance, & business models - Governance
- People: values, behaviors, development
- Agriculture
- Forest
- Ecosystems & biodiversity

Let's look at how backcasting works. Our first step in doing the backcasting was to divide the elements of the vision into ten rough pathways. I say "rough" because in this sort of work there are always overlaps. For example, requirements for water appears in several of the pathways.. Smaller subteams then worked on each of the ten.

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The ten pathways - Goals for backcasting

- **ENERGY AND POWER** - Meet increasing demand while stabilizing global temperature increase to 2 degrees Celsius – equivalent to approx. 450 ppm CO2 in atmosphere
- **BUILDINGS** - Energy efficient and comfortable living and working spaces
- **MOBILITY** - Low carbon
- **MATERIALS** - Closed-loop society
- **GLOBAL ECONOMY, FINANCE, & BUSINESS MODELS** - Transform contemporary industrial capitalism into sustainable capitalism
- **GOVERNANCE** - Enable transformations in global economy and planetary sustainability by 2050
- **PEOPLE: VALUES, BEHAVIORS, DEVELOPMENT** - Well on the way to meeting basic needs of all people by 2050
- **AGRICULTURE** - Feed 9 Billion People by 2050
- **FOREST** - Sufficient timber and fuel for 9 billion people by 2050 while reducing carbon emissions significantly
- **ECOSYSTEMS & BIODIVERSITY** - Maintain and restore

Backcasting starts with the goals for each of the individual sub-paths. These are the the goals the teams chose to work with.

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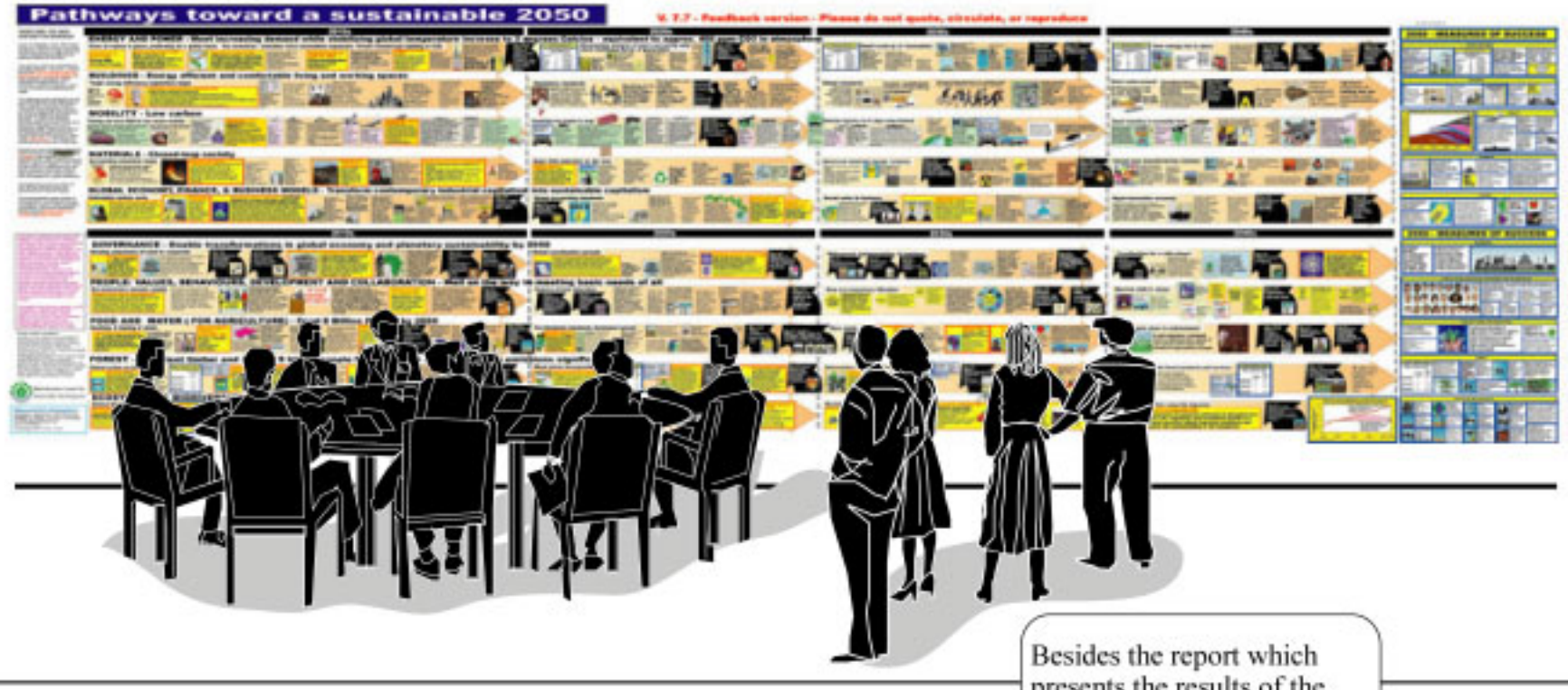
One backcasting outcome - an info-mural of how we can get to a sustainable 2050



Besides the report which presents the results of the project, one of the products of the project was the info-mural I made of the Pathways Toward a Sustainable 2050. This is what it looks like. I'll be showing you details of it in the slides coming up.

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=They
are
fed

Recall that the central element of the WBCSD Vision is that 9 billion people live well. That means that they, at minimum, have food to eat. So among the ten pathways is the agriculture path.

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2050 - MEASURES OF SUCCESS

FOOD AND WATER (FOR AGRICULTURE)

Production of food, fiber, animal feed and agricultural based biofuels increase

2x

Slight decrease in land area devoted to agriculture from 2010 levels

Agricultural greenhouse gas emissions reduced to 20% of 2008 levels

20%

To ascertain whether or not the world has achieved the vision, one would need some measures of success. And measures of success are the kind of thing which business does very well. Business likes measurable goals. Here's what measures of success were adopted for the agriculture path. Then, ***from this measurable starting place 40 years from now, the teams asked "What has to be in place in 2040 to achieve this vision?"***

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2010s

Required to be on track for a sustainable 2050 **To feed 9 billion people by 2050, food, feed, fibre, and fuel output must increase two-fold, growing 2% annually without increasing the negative environmental impact and if possible not use any more land for agriculture.**

Required to be on track for a sustainable 2050 **Asian, Pacific water efficiency doubles**

Russia & Ukraine triple wheat yield via professionalization of farming

Required to be on track for a sustainable 2050 **Freer trade in agricultural products, in order to maximize production of food and agricultural products on a global scale**

Backcasting as a tool requires that you think backwards from your goals and measures of success and ask for each decade: "What must be in place to be on track to meet the goals?" The result of doing this is a decade-by-decade set of milestones. We did this for each of the decades preceding 2050. I can't show you all of every path on the mural. That would take more than 300 slides!

So, I'll just use the agricultural path to illustrate some of what the teams identified that must be in place in the first three decades. What do we have to get started with right away in the 2010s to be sure we are on track for a sustainable 2050? Some major requirements. For example, we need to begin the task of doubling and in some cases tripling the yields of major crops in various regions of the world.

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2020s

Required to be on track for a sustainable 2050 **Ecological footprint for agriculture (including land, water and energy efficiency) adopted, international biotechnology standards in place**

Wheat production doubles World's second biggest crop in volume and represents the greatest challenge for reversing the trend of declining yield growth. Currently rate of yield gain in wheat has been falling faster than any other crop. New technologies, especially in Eastern Europe and Africa, reverse this decline

You will have noted that the backcasting identified some things as "Required to be on track for a sustainable 2050." These are ***not optional***, according to the task force, if we want to get to a sustainable 2050. These are some of the "must haves" that must be in place in the 2020s to achieve what is necessary in the 2030s and 2040s in order for the vision to be fully accomplished in 2050. Of course, on the mural there are about four hundreed items of varying significance that support or complement these requirements. ***But there are 50 or so of these "must haves" that are really essential.*** Accomplishing themm will not be easy. That is why I gave the title I did to this lecture: ***DIFFICULT (and maybe, just barely) POSSIBLE (with a little luck)***

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2030s

Required to be on track for a sustainable 2050
Brazilian agricultural productivity increases by a factor of two

Required to be on track for a sustainable 2050
Best agriculture technology available worldwide

Ambitious, but possible. **Increase of percentage irrigated crops, with the target to have increase irrigation efficiency by at least 100%**

Required to be on track for a sustainable 2050 **African agricultural yield improves by a factor of five**
With better seed, fertilizer, market access and crop protection chemicals, as well as education and extension, yields could be vastly improved.

There are more demands in the decade of the 2030s. The food (and water) issues will continue to have very high requirements in order for the world to achieve the sustainability goals for 2050 that the WBCSD team set.

Well, this gives you an idea of what backcasting involves without your having to read 400 individual chunks of information on the mural at this time.

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Backcasting *is not* what you think is likely *is not* what you think is possible

It's important to be clear about what backcasting is not. It's not what you think is likely. That is a completely different analysis and probably a considerable debate. It's not what you think is possible. That is also a completely different analysis. Backcasting is simply identifying what would be required to accomplish a specific set of goals. or vision.

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2010s FORESTS

REDD+ in Action

By the end of the decade **Major actions addressed by REDD+ begin to be implemented:**

- **Provide financial incentives to local people for conservation and expansion of ecosystem services from primary and modified natural forests.**
- **Procedures for setting emissions levels**
- **Methodologies for monitoring, reporting and verification**
- **Processes to promote the participation of indigenous peoples and local communities**

REDD stands for United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries

Required to be on track for sustainable 2050

Shift production from modified natural forest to planted forest by tripling planted forest yields by 2050

You will have noticed that the teams place a lot of emphasis on the "must haves" without which we are unlikely to reach the vision in 2050. This is perhaps the most important outcome of the WBCSD project, because it identifies a whole set of these requirements in each of the pathways. Here are two from the forest pathway.

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2010s MATERIALS

Required to be on track for a sustainable 2050 Global business and governments agree on a set of indicators & rules for accounting about resources, energy and materials. These rules establish the true cost of primary and secondary materials.

Required to be on track for a sustainable 2050 New landfill legislation begins to set standards for recycling and reuse

Required to be on track for a sustainable 2050 Industrial-application Carbon Capture and Storage
- Develop legal and regulatory frameworks, to include liability clarity for CO2
- R&D to reduce capture costs, determine storage integrity, monitoring
- Greater public awareness of benefits and cost

Just to give you a flavor of some of the "must haves" that we need to have accomplished in some of the other pathways in the coming decade, here are some from the materials pathway.

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2010-2050 ENERGY

Approx. Milestones for staying below 2°C
(average global temperature)

Approx. Amount of Energy Infrastructure Built During 2010-2050 (World wide)

	Total by 2050	Units
Coal-fired with CCS	1400	500 mw CCS plants
Gas-fired with CCS	800	500 mw CCS plants
Nuclear	1280	1000 mw nuclear plants
Hydro	120	5000 mw dams
Biomass plants	4000	50 mw biomass plants
Wind-onshore	560000	4 mw wind turbines
Wind-offshore	150000	4 mw wind turbines
Geothermal	5200	100 mw geothermal units
Solar Photovoltaic	24800	50 mw installations
Concentrated solar	3200	250 mw installations

Source: IEA Blue

And here is what is required to be on track for a sustainable 2050 in global energy infrastructure. This lists the number of new power plants of different kinds that the International Energy Agency calculated for one of their standard scenarios to stay below two degree increase in average global temperature by 2050. As you can see, there is an immense amount of work to be done in all the paths I've shown.

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2010s ENERGY

Required to be on track for 2050
Energy R&D increases rapidly

Required to be on track for 2050
Distorting energy subsidies phased out and increased international cooperation in deploying low-carbon technology

Required to be on track for 2050
Major collection of international agreements on climate and energy Not necessarily treaties, but perhaps bilateral and multilateral agreements

Required to be on track for 2050
Carbon sequestration funded for rapid deployment

Required to be on track for 2050
Carbon has a price - cap & trade or carbon tax begin to transform electric power generation Maybe through a comprehensive treaty or perhaps a series of multilateral agreements

If we are to come anywhere close to achieving the energy vision (which is required to adequately respond to climate change) we have a set of urgent things that much be accomplished in the next ten years. If we don't, according to the WBCSD analysis, we won't get to a sustainable 2050. Here are some of the "must haves" for the decade of the 2010s.

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Approx. 50 "Must Not Happens"

Big risk delayed
Major, rapid onset of drought, migration & resource wars in Africa

Big risk
Increasing gap between wealthy and poor

Big risk
Multiple, overlapping state failures in Africa

Big risk
Proliferation of biological weapons

Big risk
Failure of carbon sequestration

Big risk
Massive rise of international drug and crime organizations

While we are discussing the must haves, I should also mention that we identified 49 Big Risks, most of which can be considered ***"must not happens."*** They are represented as backward arrows on the ten individual pathways on the mural. The task force did not do a great deal of further analysis beyond identifying them as Big Risks. A few examples are shown here.

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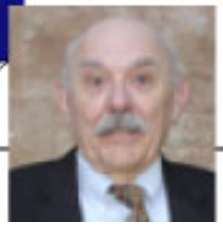
FIRST DRAFT

What is required to be on track for a sustainable 2050?

Project: World Business Council for Sustainable Development **Vision 2050**

So, what we have accomplished is a ***pretty good first draft of what is required*** - if we want to have a sustainable civilization on a planet that is still in pretty good shape to support 9 billion people. Of course, it can be refined, added to, and revised as the world responds to the current state of affairs.



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Most important outcome *(so far)*

- **Must haves**
  (i.e required to be on track for a sustainable 2050)
- **Must not haves**
  (i.e. the big risks)

So, if you were to ask me what is the most important outcome of the WBCSD Vision 2050 project, I'd say that the identification of the "must haves" and "must not haves" is far and away the most significant.

Of course, many experts and many organizations have outlined what is needed. But none to my knowledge has done such a comprehensive job. And certainly the business community has not spoken up as definitively in this manner.

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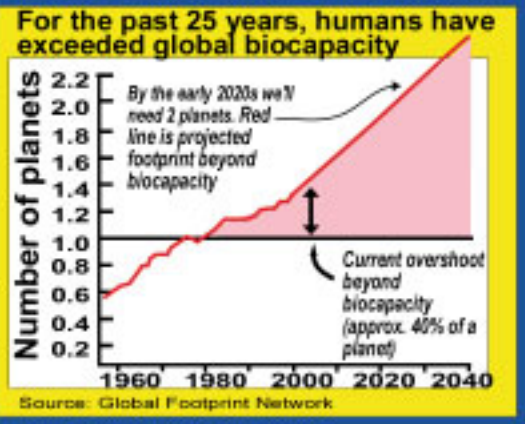
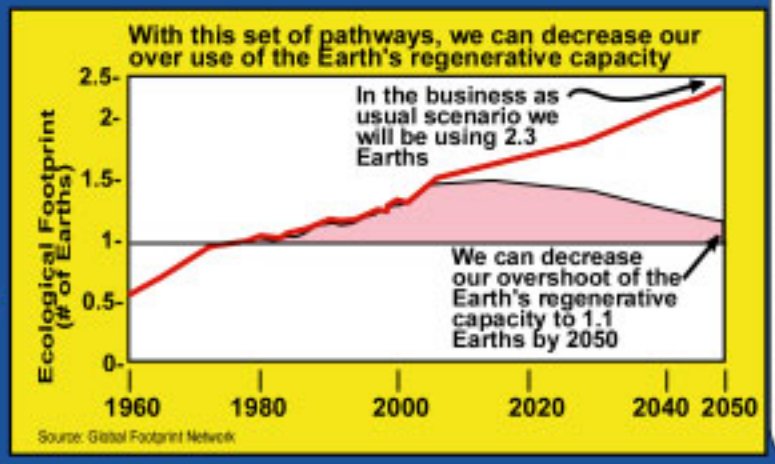
Perhaps most important outcome *(so far)*

Major business group publicly adopts Global Footprint Network concept

This is our current situation





The Global Footprint Network's careful identification and integration of all the factors that compose the Earth's regenerative capacity is becoming one of the important measures of planetary sustainability. They are the folks who tell us how many Earth's we are using now and how soon we might be using 2 Earths in the future if we keep on doing what we are doing.

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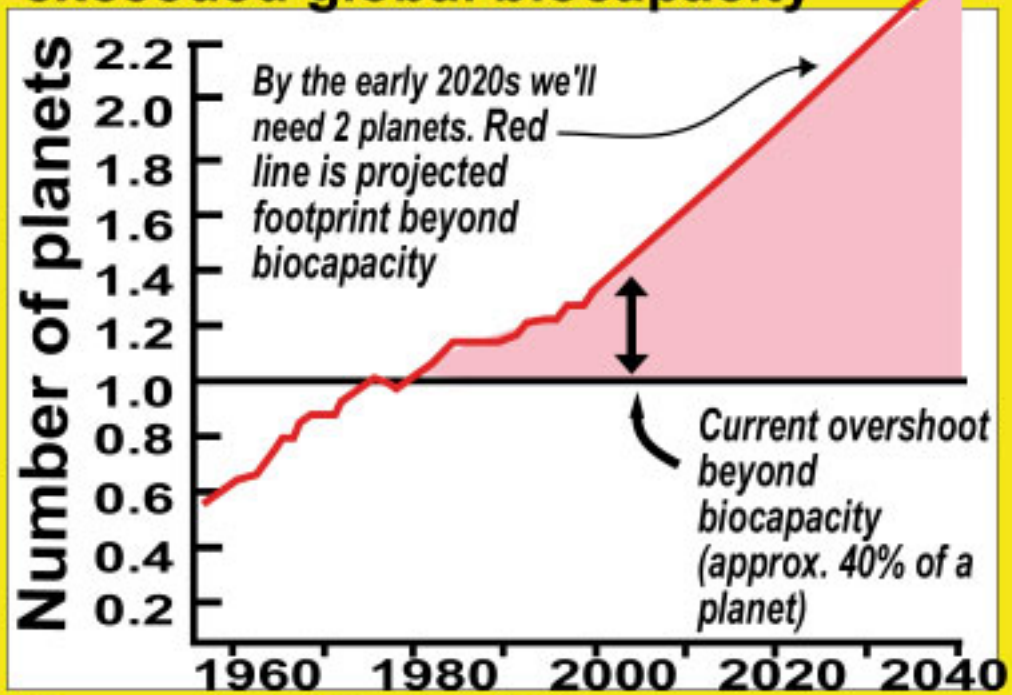
This is our current situation

For the past 25 years, humans have exceeded global biocapacity



Source: Global Footprint Network

If Global Footprint Network measurements are such an important part of this backcasting then perhaps you'd like to take a closer look at the chart of our current situation.

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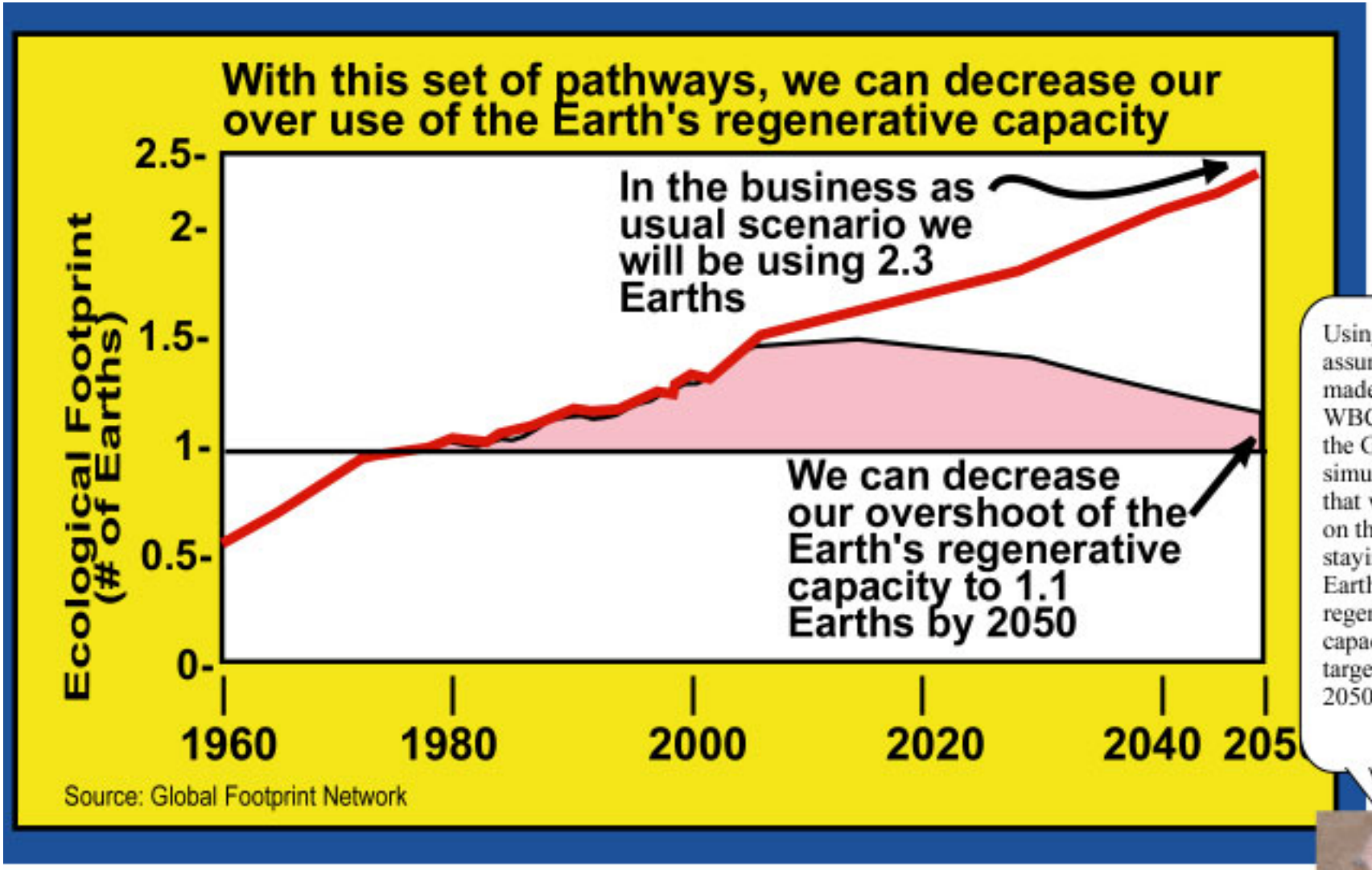

Using the assumptions we made in the WBCSD project the GFN simulation show that we can be well on the way to staying within the Earth's regenerative capacity by our target year of 2050.

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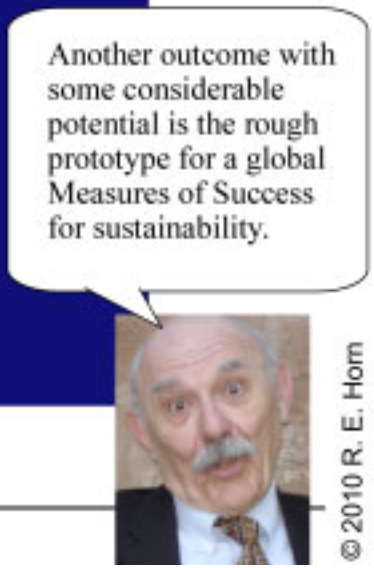
FIRST DRAFT

Global Measures of Success

Project: World Business Council for Sustainable Development
Vision 2050



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BIGGEST TASK

How do we solve the people and government issues?

As a political scientist, I note that, in many of the individual pathways (energy, forest, food, etc) the requirements to be on track for a sustainable 2050 lead back to significant, new, and quite often, novel, accomplishments of governments working together. ***And as of now, governments have not managed to achieve what is needed. This should certainly one of the major goals of any project built on what we have done in the WBCSD task force on Vision 2050.***

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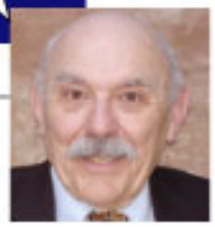
Project limits

- only tells you what's necessary
- not the social, political, economic, and human dynamics necessary to make it happen

It's important to recognize the limits of our backcasting project. The most important limit is that it has only told us what is important and necessary, ***not specific events and actions that must happen to accomplish the must haves.*** That must be accomplished in a next phase of the analysis and probably needs to be done by industry and region.



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Future projects need to focus on

- how pathways cross-connected
- how goverment action would take place
- what dilemmas, contradictions are implied
- elephants in the room (many of them)
- technical breakthroughs and wild cards that might happen
- coming to grips with the multiple feedback loops involved
- mitigating the big risks

No project can do everything. It's important to identify the limits of any project. Here are some of the major things we would like to have done - given a larger budget, more expert resources, and more time. We did spend a little time on some of the big risks, but only enough to identify them as "must not happens" for the world to accomplish Vision 2050.

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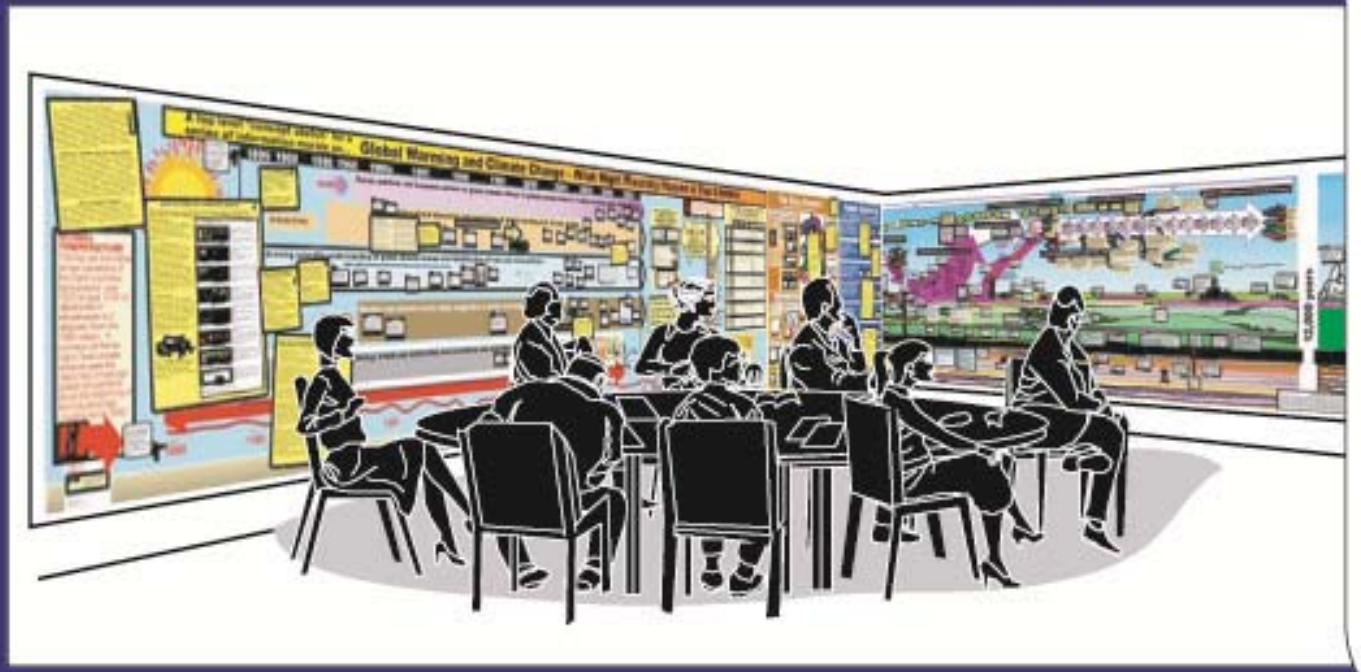
How can the pathways be used?

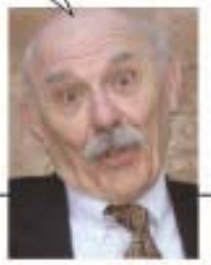
Further analysis and strategy



A major purposes of information murals, especially the Pathways, is to provide a contextual tool for strategic discussions regarding sustainable futures. For some of the WBCSD companies, these murals will be important tools for thinking about the sustainable world they would like to be operating in.

In providing context, ***additional murals that focus on company or industry sector-specific environments could also be created***, although they are not part of the current Vision 2050 project. For example, I have worked on a on a complementary suite of diagrams and murals climate change causes, consequences and interventions. The slide here shows a conference room designed for strategic discussions containing our murals. If computrer-controlled, wall-size display screens are used. the room become a dynamic decision environment.

A flexible, modifable tool for thinking



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How to use info-murals?

Education - Orientation - Outreach

Murals provide opportunities to learn and to integrate learnings. Some people in WBCSD member companies will not have yet thought comprehensively about sustainable futures. They will not have yet realized that to get to a sustainable 2050, there is a lot to be done and that there is no magic bullet. Rather, there will be a need for more comprehensive thinking and innovation across a vast set of complex futures that will entail the whole organization. Our Pathways mural is a major step toward providing one such detailed and comprehensive view of sustainable futures.

This suite of murals provides a foundation for both individual learning and a methodology for representing what the organizations know.

Project: World Business Council for Sustainable Development **Vision 2050**

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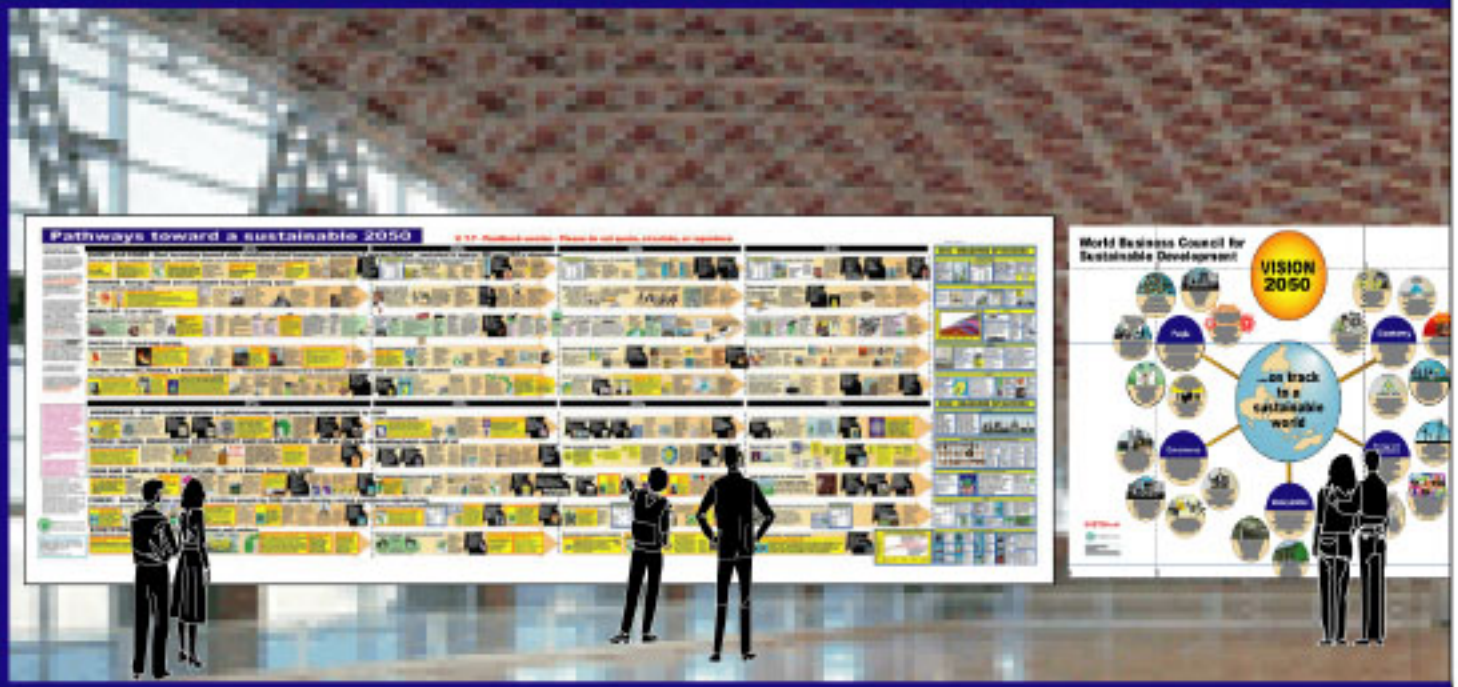
How can the pathways be used?

Education and focus of public discussion



The mural can be used for aligning the whole organization with the evolving strategic environments. We imagine some companies placing our three murals in the lobbies of corporate headquarters (and other buildings and perhaps even at conferences and showcase meetings) as a way of inviting stakeholders to learn about the planetary situation and how the company is thinking about these critical sustainability issues. This concept illustration shows a rather large lobby. Murals can be printed at almost any size. The murals are printed on paper or vinyl and can be easily hung.

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How can the pathways be used?

Some businesses and CEOs use it to speak

And I might suggest that CEOs who want to call the attention of their organizations to the importance and urgency of our planetary situation, they can put a copy of the mural in the hallway leading to their offices. When I used to be a CEO, my staff paid pretty close attention to what I had on my walls.

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Bob Horn helps organizations…

… understand complex, messy issues with analysis, strategy, and facilitation.

All of the following engagements and others have in common visual-based tools to help organizations deal with wicked problems and messy policy situations. We have created visual panoramas of many kinds for addressing different phases and aspects of issue understanding and development.

Recent projects have included:

- Vision 2050 – World Business Council for Sustainable Development, Geneva
- Radioactive waste disposal for Nirex (UK government agency)
- Avian flu pandemic scenario for PanDefense 1.0 conference
- Climate change and energy security for British Foreign Office
- Climate-Energy issues for International Futures Forum
- Research management, NASA
- Youth programs, Carnegie Trust (UK foundation)
- Global mental health (Davos)
- Public mental health mess, Portland, OR task force
- Elderly and disabled mess, Alameda CA task force
- Strategy workshop, Department of the Environment, Province of Alberta, Canada
- Emerging workforce dilemmas, California Workforce Association
- Health issues, United Methodist Church USA
- Visual capability building, Foresight Canada

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For more info on Visual Language book

http://www.xplane.com/visuallanguage

for more on Bob Horn's current work (well, a little out of date):

www.stanford.edu/~rhorn

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