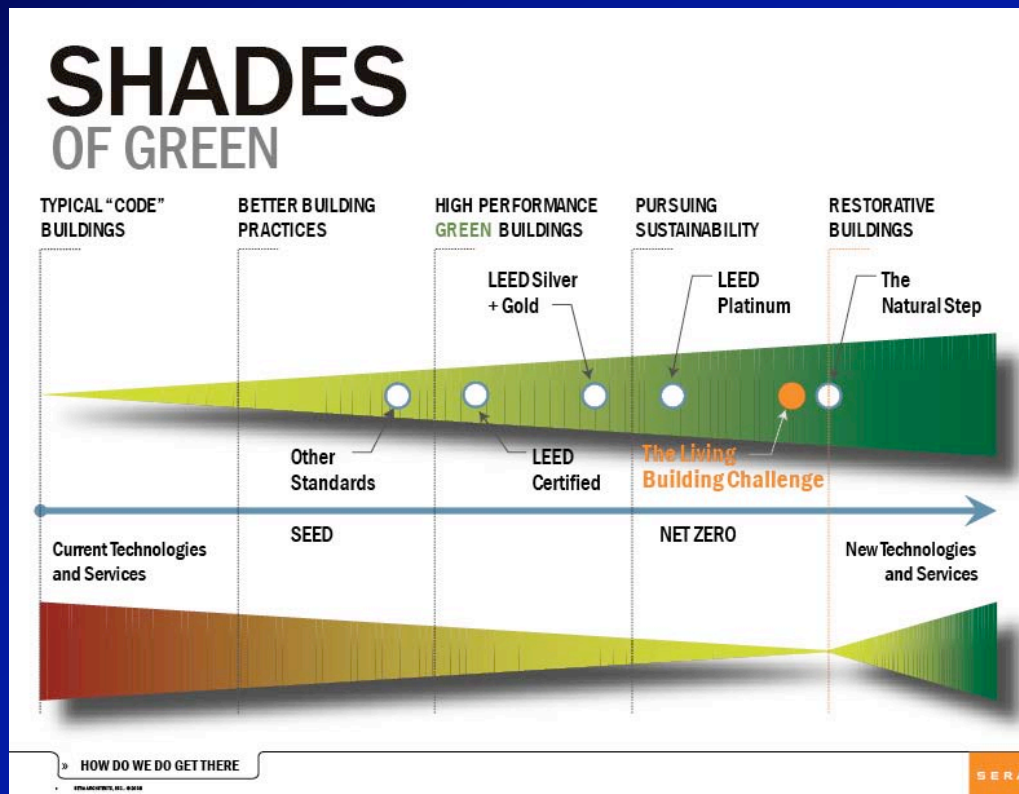


Sustainability: Beyond Green Building and Smart Growth

Christchurch City Council Chambers
September 6, 2008



David Eisenberg
Director

Development Center for Appropriate Technology

Development Center for Appropriate Technology - 2008



For the past dozen years I've been working towards an intention: that if we are to deal responsibly with the risks associated with building and development, we need to be able to see those risks...fully, clearly, and in context...



I think we have a small window of opportunity to save ourselves as a species.

I believe that window is the size and shape of the human heart...



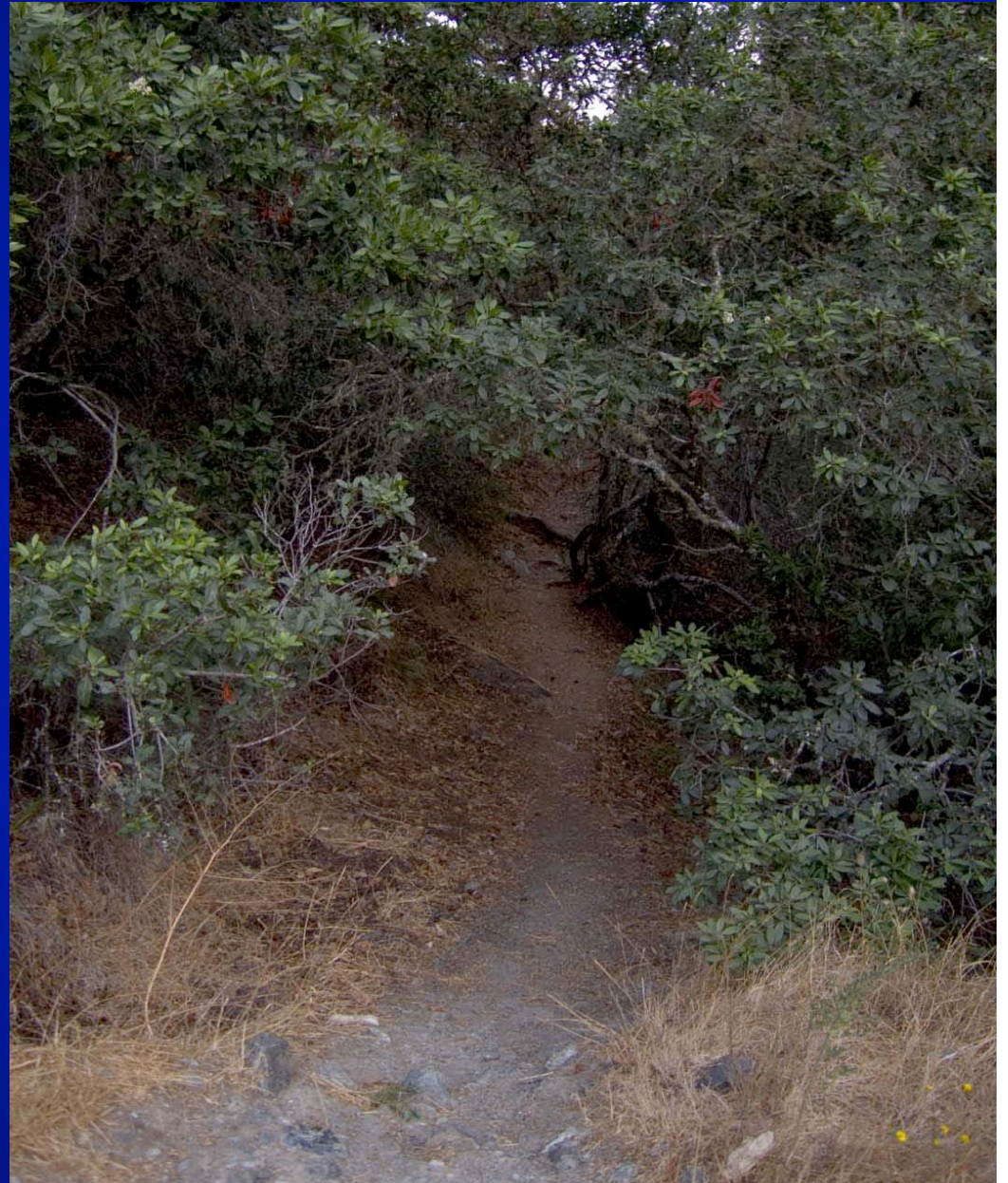
Most of the systems we have created are far beneath the dignity and magnificence of the human species.

These systems denature us.

They override our fundamental nature as a caring, creative, nurturing species.

Finding the Trailhead...

Almost exactly 11 years ago I got up in front of a thousand building officials in Phoenix, Arizona, knowing that I only had ten minutes to give the 20 minute presentation I had prepared...



Finding the Trailhead...

Phoenix was a breakthrough for me and the work. It was when we started (unofficially) doing what we call "Heart Work with Code Officials"

It was also just the beginning of a long process.

We created "Building Sustainability into the Codes"

- a three-phased program -

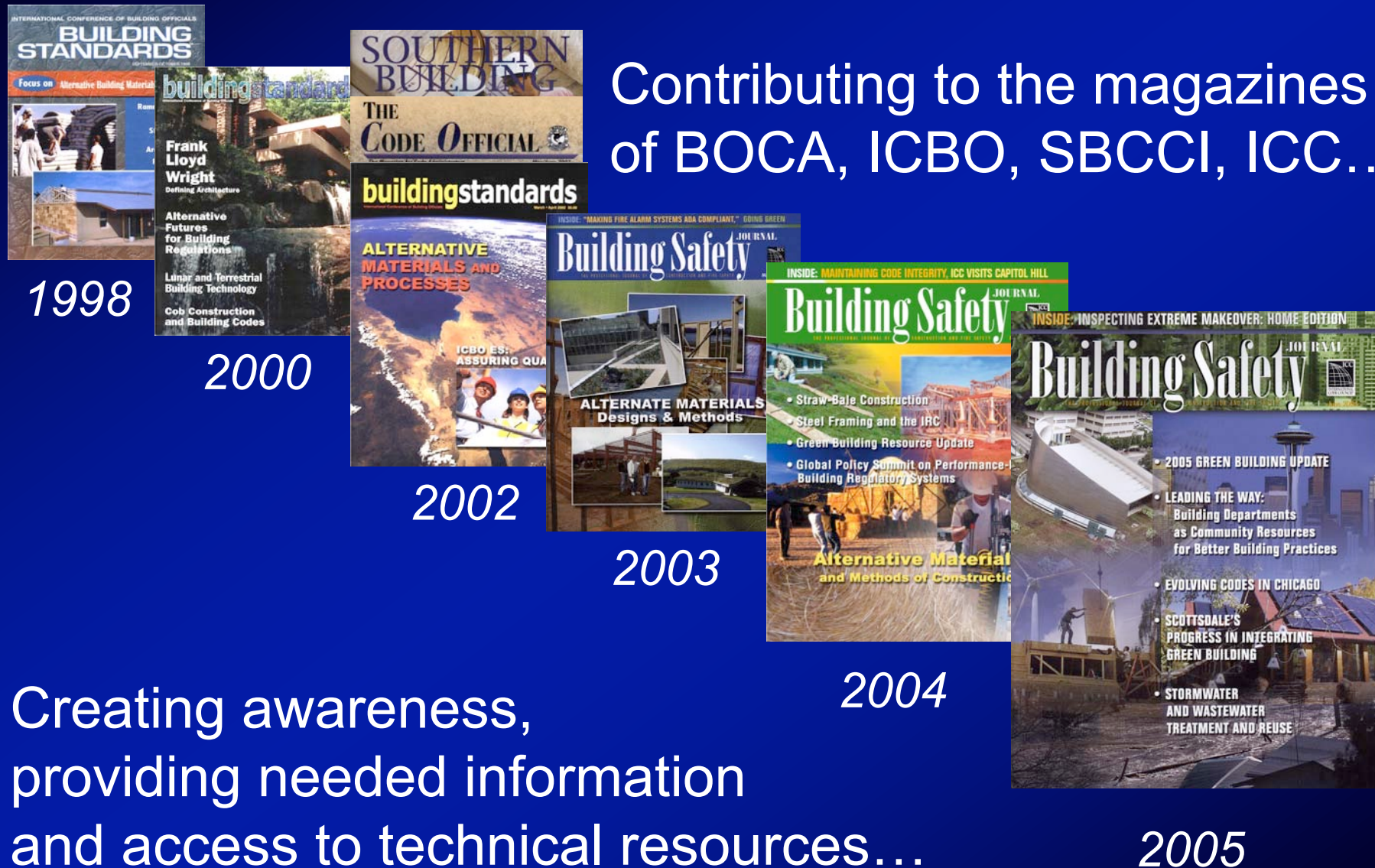
1st - Building Awareness of the need for change

2nd - Building Capacity to be able to change

3rd - Transfer of Leadership

And We Went to Work...

Contributing to the magazines of BOCA, ICBO, SBCCI, ICC...

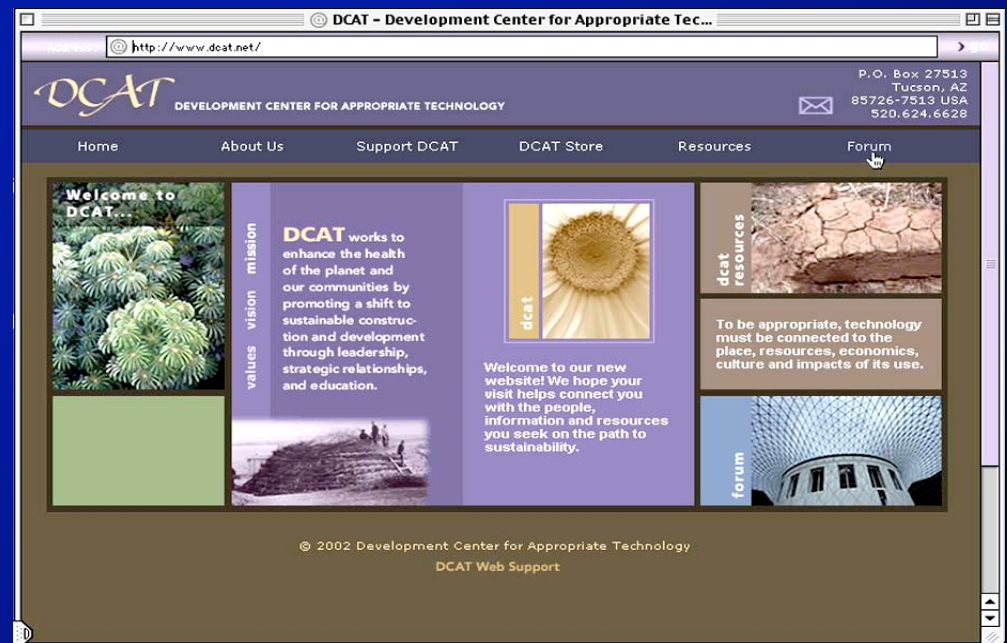


1st and 2nd Phases...

We produced a 50 minute video *Building Codes for a Small Planet* to tell this story more widely.



We upgraded the DCAT website
www.dcat.net



And things are moving...



ICC-USGBC MOU May 2007

Green Codes Summit

July 11-12, 2007
 The American Institute of Architects
 1735 New York Avenue, NW
 Washington, DC 20006

Designed to afford participants the opportunity to gain a greater understanding of the options and issues associated with "green" regulations and to give them insight into methods to improve their efforts back home, the AIA hopes you will be a part of this exciting endeavor.

You are invited to be a principle participant in the summit and will be asked to bring to the summit the resource materials that your community has gathered and any draft legislation or other approach you have been working on. Our hope is that by sharing with others, you and the AIA can derive a better solution that we can all share.

The Green Codes Summit will begin with dinner on the evening of Wednesday, July 11, and continue on Thursday, July 12, from 8:30 a.m. to 3:30 p.m., in Washington, DC.



- Developing Green Building Programs
- The Cost to Go Green
- The Greening of Building Codes
- 2007 Supplement to the I-Codes Significant Changes
- Building Valuation Data

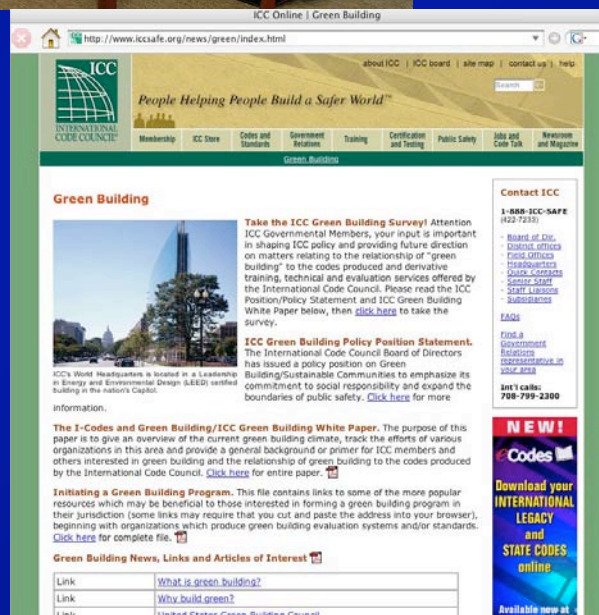
August 2007

ICC Headquarters, located in the LEED certified National Association of Realtors building in Washington, D.C.

Development Center for Appropriate Technology - 2008

Third Phase!

ICC Green Building Home Page



2007 - Some Acknowledgment



A Lot is Happening...



The Challenge of a Lifetime by David Eisenberg

I am thrilled to be writing this first column for the new Green Building section of *Building Safety Journal*. In future issues, ICC Senior Staff Architect Allan Bilka and I will alternate using this space to present a broad spectrum of ideas, information and opinions about the world of green building and building codes. My aim in this inaugural entry is to convey the importance and uniqueness of this moment in time and the crucial role I believe the building codes community can play in addressing some of the more pressing challenges we are likely to face.

First, however, I wish to acknowledge the visionary leadership provided over the past year by ICC CEO Rick Weiland and Immediate Past Board President Wally Bailey, along with the commitment demonstrated by the Code Council's Board and staff to sustainability and green building. From the issuance of a Green Building Policy Statement in January 2007; to entering into an MOU with the U.S. Green Building Council; to the move into new green headquarters in Washington, D.C.; to the creation of a dedicated green building webpage (www.iccsafe.org/news/green); to cosponsoring the Green Codes Summit with the American Institute of Architects; to participating in the development of American Society of Heating, Refrigerating and Air-Conditioning Engineers Standard 189, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*; to partnering with the National

Association of Home Builders to develop the *National Green Building Standard* for residential construction; to the August *Building Safety Journal* sustainability feature issue; and more, ICC has demonstrated that it is serious about this endeavor. This is a great start and congratulations are in order.

Defining the Challenges

Many of you will recall that among Wally Bailey's key goals during his term as President were raising the profile of building officials in the public eye and promoting sustainability and green building, and 2008 ICC Board President Steven Shapiro has made it clear that he intends to continue to pursue these efforts. What may not be so obvious is how closely related these two initiatives may prove to be.

There are few more crucial challenges than those we are beginning to comprehend related to climate change and the world's demand for, and supply of, energy and water. A recent meeting of the world's petroleum experts found them in basic agreement that we are rapidly approaching the moment when the demand for petroleum will outstrip the capacity of the planet to supply it, and the effects and rate of climate change documented around the world have greatly alarmed the scientific community, with projections about sea rise previously formulated in centuries now being discussed in terms of decades.

Now consider recent studies indicating that, taken together, building construction, operation and

What we have now in the US
A platform...
The audience...
A strong message:

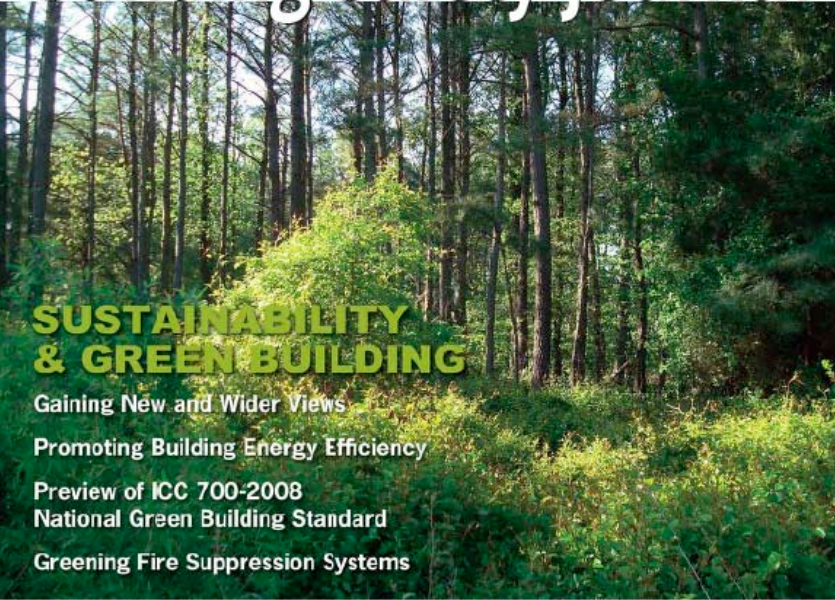
We have a regular column in the ICC magazine, *Building Safety Journal*. My first column frames this shift as "The Challenge of a Lifetime" essentially calling them to do the most important work of their careers!

A Lot is Happening...

THE PROFESSIONAL JOURNAL OF CONSTRUCTION AND FIRE SAFETY




JUNE 2008

building safety journal



SUSTAINABILITY & GREEN BUILDING

Gaining New and Wider Views
Promoting Building Energy Efficiency
Preview of ICC 700-2008 National Green Building Standard
Greening Fire Suppression Systems



INTERNATIONAL CODE COUNCIL

People Helping People Build a Safer World™



Gaining New and Wider Views

by David Eisenberg

Creating a new theory is not like destroying an old barn and erecting a skyscraper in its place. It is rather like climbing a mountain, gaining new and wider views, discovering unexpected connections between our starting point and its rich environment. But the point from which we started out still exists and can be seen, although it appears smaller and forms a tiny part of our broad view gained by the mastery of the obstacles on our adventurous way up.

— Albert Einstein

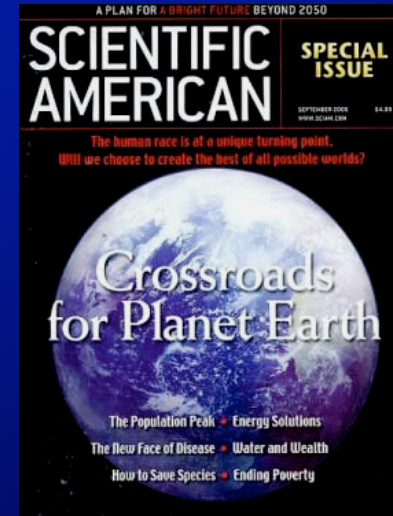
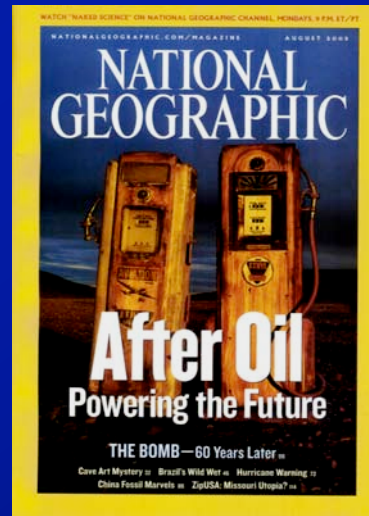
This quotation accurately describes the essential process of learning: how the experience of working something through enhances and expands our view of reality. We have been required to do much learning lately. Those who have heard about net-zero energy buildings and programs like the Living Building Challenge—which is also working toward net-zero water balance and very high environmental performance—and think these goals are decades away from implementation might want to get out their hiking boots and compasses, because there is a high probability that these kinds of projects will begin sprouting up across the country in the next few years.

The rapid changes we are seeing are driven by emerging realities that are forcing increasing numbers of people in responsible public policy and business leadership positions to rethink what is required of them to fulfill their duties with regard to the health and welfare of their communities and businesses. As a result, the dialogue is shifting from whether issues associated with global climate change are real or serious and if and when we should respond to them, to finding the most effective and beneficial path forward.

Designers, builders and developers ahead of the mainstream have been pushing hard in this direction and have discovered that high

The Timing is Right for the Next Leap

So, the code officials are coming on board just in time... we're going to have to greatly accelerate this work and ratchet up the goals and targets as we begin to deal with the realities of peak oil and climate change and more. Great progress...but we're nowhere near *there* yet...

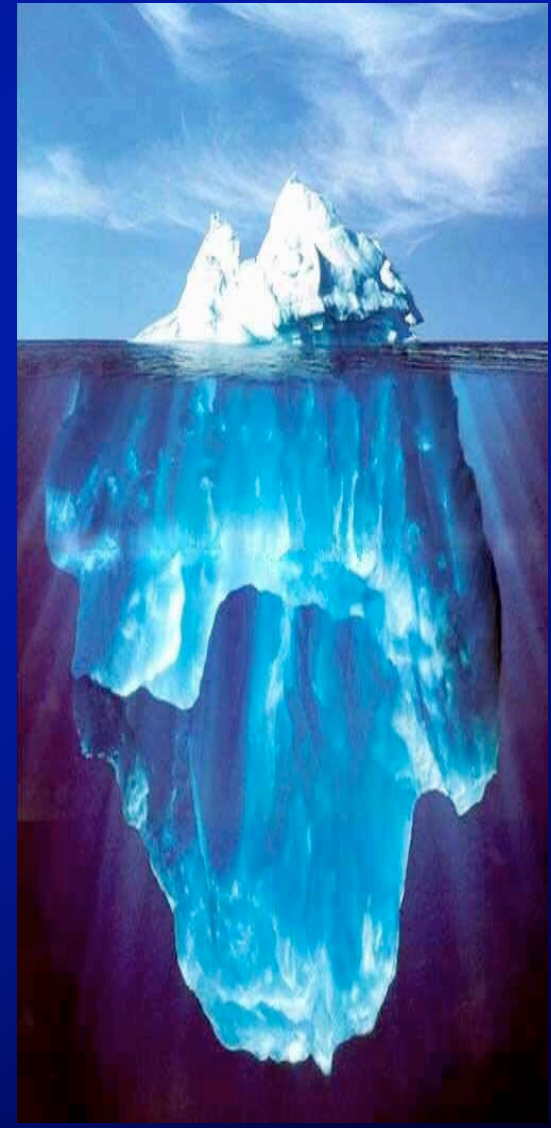


Bigger Context: Just the tip of the Iceberg...

Green building, Smart Growth, Energy Star, LEED, changes in codes, etc. are all steps in the right direction, but they're really only first steps...

The magnitude of what we're facing is daunting.

The good news is that we've finally overcome inertia of rest and things are moving... But we need to keep seeing the big picture...



Where We Are - Ecological Footprint

Ecological footprint is a concept based on carrying capacity. It's a way to calculate the amount of productive land required to supply resources and absorb wastes from a given activity - of an individual, organization, community, nation or population, including the world population.



The Picture that is Emerging...



There's credible evidence that if each person on Earth used resources & generated wastes at the rate of the average American, Canadian, or member of the EU we would need several more Earths to sustain that level of human activity. And that's for Earth's current population.

The Big Picture - Living Planet Report



WWF® *for a living planet®*



LIVING PLANET REPORT 2006

Download the Report:
<http://www.footprintnetwork.org>



ZSL
LIVING CONSERVATION

THE ECOLOGICAL FOOTPRINT

The Ecological Footprint measures people's demand on nature. A country's footprint is the total area required to produce the food and fibre that it consumes, absorb its waste, and provide space for its infrastructure. People consume resources and ecological services from all over the world, so their footprint is the sum of these areas, wherever they are on the planet. The footprint can be compared with nature's ability to renew these resources.

The global Ecological Footprint was 13.5 billion global hectares in 2001, or 2.2 global hectares per person (a global hectare is a hectare whose biological productivity equals

the global average). This demand on nature can be compared with the Earth's biocapacity, based on its biologically productive area – approximately 11.3 billion global hectares, which is a quarter of the Earth's surface. The productive area of the biosphere translates into an average of 1.8 global hectares per person in 2001.

The global Ecological Footprint decreases with smaller population size, less consumption per person, and higher resource efficiency. The Earth's biocapacity increases with a larger biologically productive area and higher productivity per unit area.

In 2001, humanity's Ecological Footprint exceeded global biocapacity by 0.4 global hectares per person, or 21 per cent. This global overshoot began in the 1980s and has been growing ever since (see Figure 1). In effect, overshoot means spending nature's capital faster than it is being regenerated. Overshoot may permanently reduce ecological capacity.

Figure 3: The Ecological Footprint per person for countries with populations over 1 million.

Figure 4: Humanity's Ecological Footprint grew by about 160 per cent from 1961 to 2001, somewhat faster than population which doubled over the same period.

Figure 5: Ecological Footprint by region in 2001. The height of each bar is proportional to each region's average footprint per person, the width is proportional to its population, and the area of the bar is proportional to its total footprint.

Fig. 3: ECOLOGICAL FOOTPRINT PER PERSON, by country, 2001

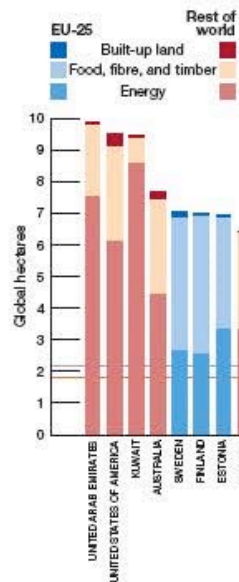


Fig. 4: HUMANITY'S ECOLOGICAL FOOTPRINT, 1961-2001

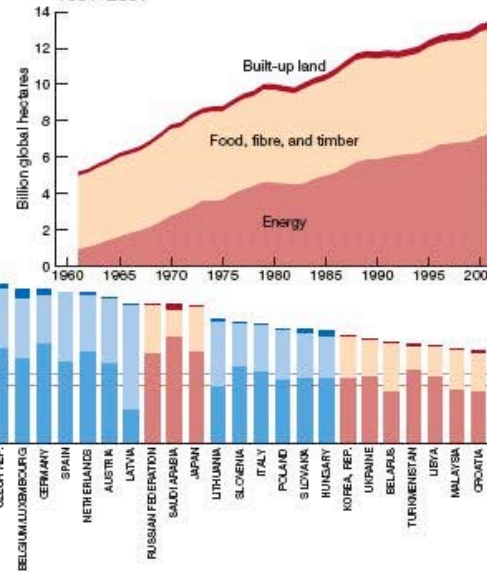


Fig. 5: ECOLOGICAL FOOTPRINT BY REGION, 2001

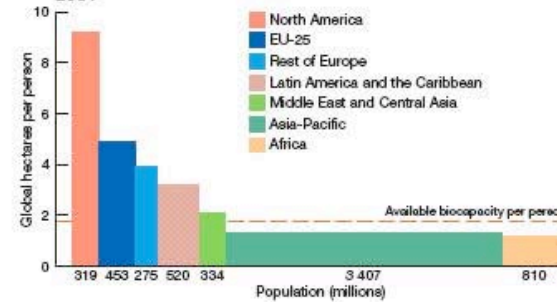
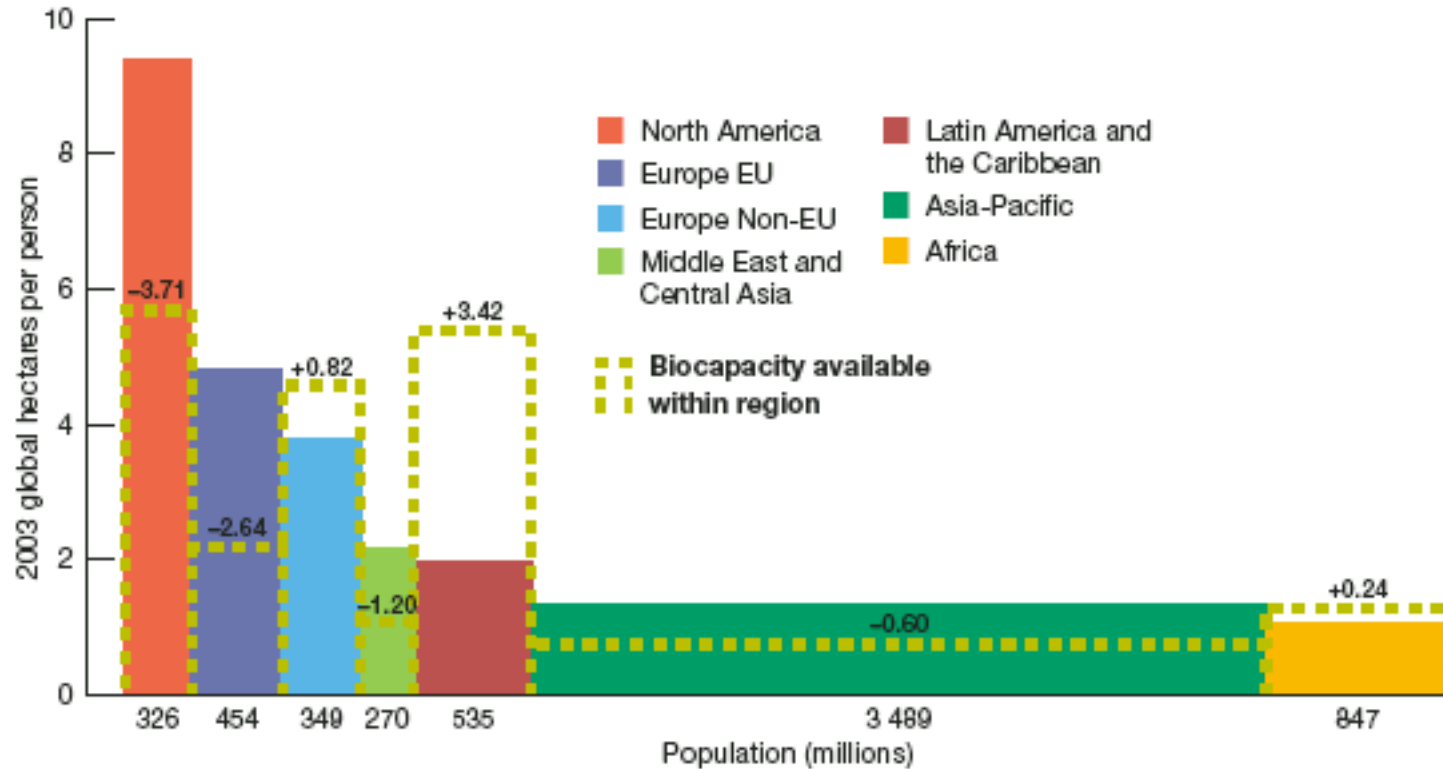


Fig. 20: ECOLOGICAL FOOTPRINT AND BIOCAPACITY BY REGION, 2003



From the 2006 Living Planet Report

Where We Are...

REALITY - We're maintaining our high standard of living by *importing* resources, cheap labor and ecological capacity from the developing world.

Surplus global ecological capacity no longer exists.

Ecological footprint is increasing in both the developed and developing world and world population is growing.

Buildings account for a majority of this footprint and energy accounts for much of that.

THE FOOTPRINT AND HUMAN DEVELOPMENT

Sustainable development is a commitment to “improving the quality of human life while living within the carrying capacity of supporting ecosystems” (IUCN *et al.*, 1991).

Countries’ progress towards sustainable development can be assessed using the United Nations Development Programme’s (UNDP) Human Development Index (HDI) as an indicator of well-being, and the footprint as a measure of demand on the biosphere. The HDI is calculated from life expectancy, literacy and education, and per capita GDP. UNDP considers an HDI value of more than 0.8 to be “high human development”. Meanwhile, a footprint lower than 1.8 global hectares per person, the average biocapacity available per person on the planet, could denote sustainability at the global level.

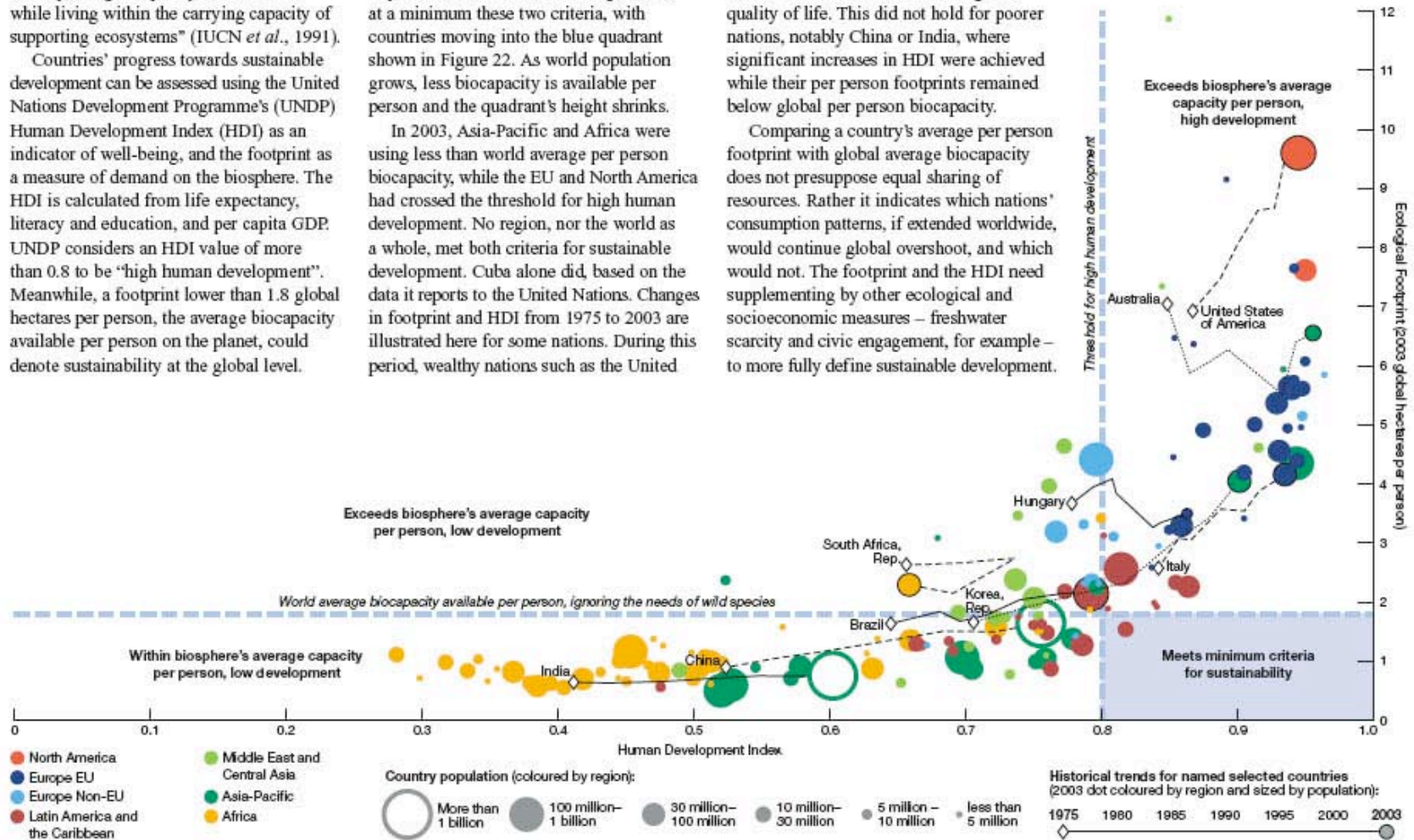
Successful sustainable development requires that the world, on average, meets at a minimum these two criteria, with countries moving into the blue quadrant shown in Figure 22. As world population grows, less biocapacity is available per person and the quadrant’s height shrinks.

In 2003, Asia-Pacific and Africa were using less than world average per person biocapacity, while the EU and North America had crossed the threshold for high human development. No region, nor the world as a whole, met both criteria for sustainable development. Cuba alone did, based on the data it reports to the United Nations. Changes in footprint and HDI from 1975 to 2003 are illustrated here for some nations. During this period, wealthy nations such as the United

States of America significantly increased their resource use while increasing their quality of life. This did not hold for poorer nations, notably China or India, where significant increases in HDI were achieved while their per person footprints remained below global per person biocapacity.

Comparing a country’s average per person footprint with global average biocapacity does not presuppose equal sharing of resources. Rather it indicates which nations’ consumption patterns, if extended worldwide, would continue global overshoot, and which would not. The footprint and the HDI need supplementing by other ecological and socioeconomic measures – freshwater scarcity and civic engagement, for example – to more fully define sustainable development.

Fig. 22: HUMAN DEVELOPMENT AND ECOLOGICAL FOOTPRINTS, 2003



Climate change

Positive proof of global warming.



**18th
Century**

1900

1950

1970

1980

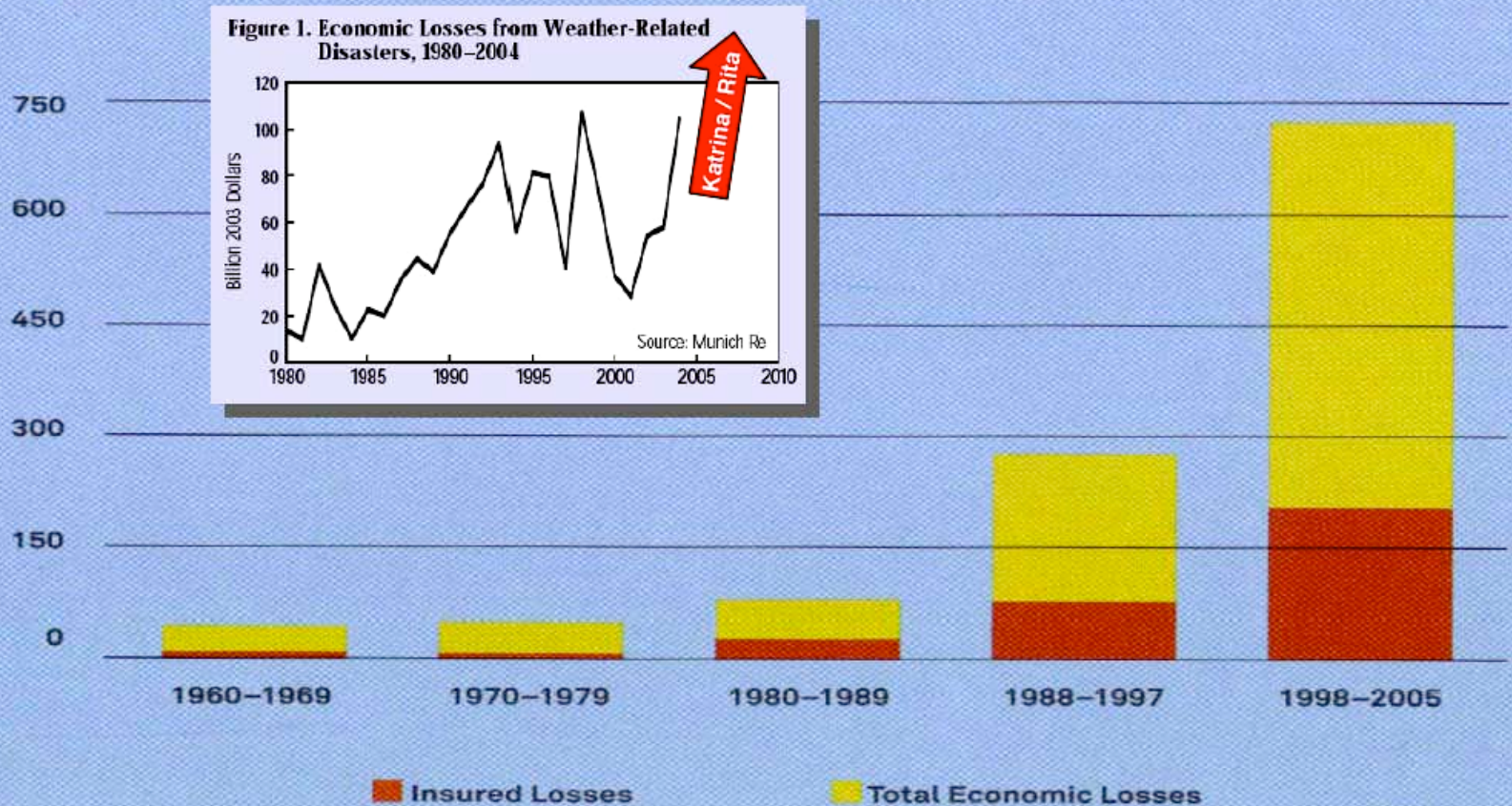
1990

2000

2008

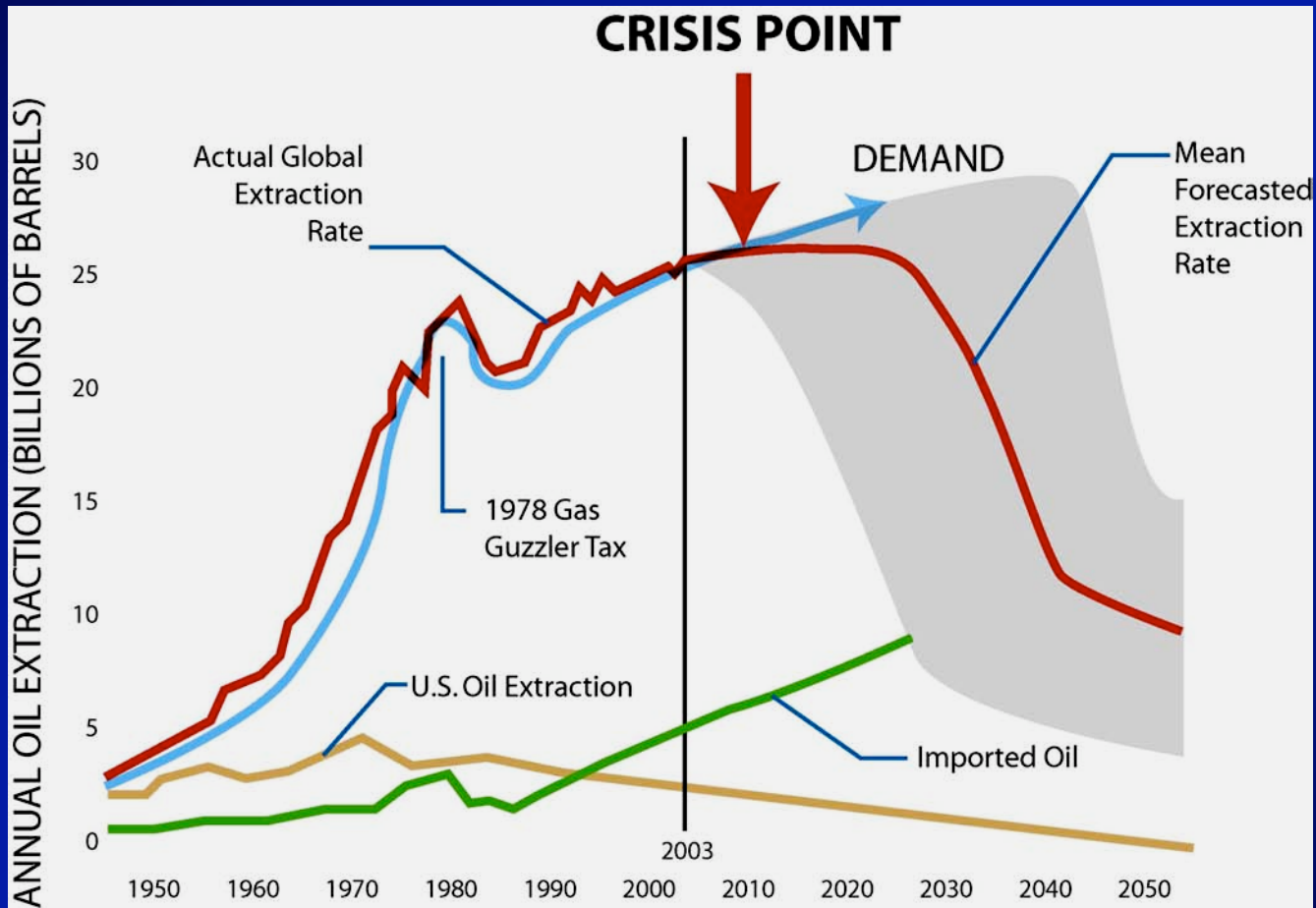
Don't Trust Scientists? ...How About Insurers?

GREAT WEATHER AND FLOOD CATASTROPHES: LOSSES IN BILLIONS OF U.S. DOLLARS



SOURCE: MUNICH RE, SWISS RE, 2005, SIGMA FIGURES AS OF 12/20/05

Where We Are - Peak Oil



Source: Dr. Donald Aitken, ISES/ASES World Solar Congress 2005

Excerpted from,
and a Sign of
"The Times..."

And I didn't
have to make
this up...

From **The Times**

June 14, 2008

Scientists find bugs that eat waste and excrete petrol

Silicon Valley is experimenting with bacteria that have been genetically altered to provide 'renewable petroleum'



Some diesel fuel produced by genetically modified bugs

TIMES RECOMMENDS

- > Prince Philip attacks big families
- > Take a dip in Dubai-on-Thames
- > Eco Worrier: How can I persuade my husband to use a push mower?

BLOG: GREEN CENTRAL

He means bugs. To be more precise: the genetic alteration of bugs – very, very small ones – so that when they feed on agricultural waste such as woodchips or wheat straw, they do something extraordinary. They excrete crude oil.

Unbelievably, this is not science fiction. Mr Pal holds up a small beaker of bug excretion that could, theoretically, be poured into the tank of the giant Lexus SUV next to us. Not that Mr Pal is willing to risk it just yet. He gives it a month before the first vehicle is filled up on what he calls "renewable petroleum". After that, he grins, "it's a brave new world".

Mr Pal is a senior director of LS9, one of several companies in or near Silicon Valley that have spurned traditional high-tech activities such as software and networking and

Barrier Reef?

US WEATHER



Iowa Governor Chet Culver warns of "a 500-year type of event" after record flooding

[Slide Show](#)

It may not be
Science Fiction
but it surely is a
Brave New World!

Not Just Energy - Water and Energy are Linked

There is a large energy component to water,
and a large water component to energy...



Where we are - at a Crossroads



Time to Evolve...



Life After Cheap Energy & a Stable Climate

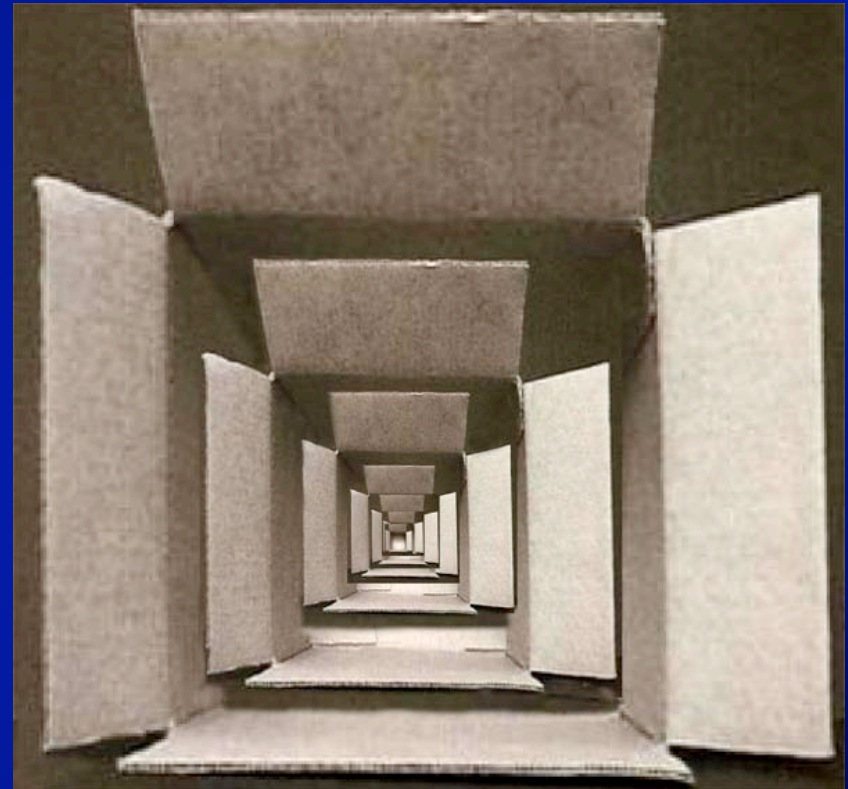
We can't rely on our past assumptions about progress, technology, risk, standard of living, national security, global security, trade, or economics. It is all changing.

Today's energy and climate realities are stunning and stark. We have crucial choices to make and not much time to make them. We have what we need to find a safer path forward but to choose it, we have to ***change our minds*** and ***then change our behaviors...***

Get Out of the Box

We often hear that we need to think "outside the box" to deal with our problems today.

But it's a process -
expand your field of view,
get out of the box you're in
...into the next bigger box.



See the Details AND the Big Picture...

To get out of boxes requires knowing if you're working in the details or the big picture, in the past, present or future, and constantly shifting your focus back and forth.

That helps keep things in perspective and proportion, enabling us to see the *things* as well as the *relationships* between them.



The Purpose of Building Codes

International Building Code (USA) - 2000 edition

101.3 ***The purpose of this code is to*** establish the minimum requirements to ***safeguard the public health, safety and general welfare*** through structural strength, means of egress facilities, stability, sanitation, adequate light and ventilation, energy conservation, and safety to life and property ***from*** fire and other ***hazards attributed to the built environment.***

Big Picture in White - Details in Blue

What's Protected and What's at Risk?



Modern building codes enable us to design and build structures that are safe for their occupants, making it seem that we've eliminated or greatly reduced the risks associated with buildings.

What's Protected and What's at Risk?

We've just moved those risks in space and time:

- away from the building site, and
- into the future.




Big Problems Hidden in Plain View

Looking at buildings through codes is like looking through a microscope. The individual, building-related risks fill the field of view.

But, it's like dealing with risk with tweezers, while creating many orders of magnitude greater, generalized risk for everyone, including all future generations.



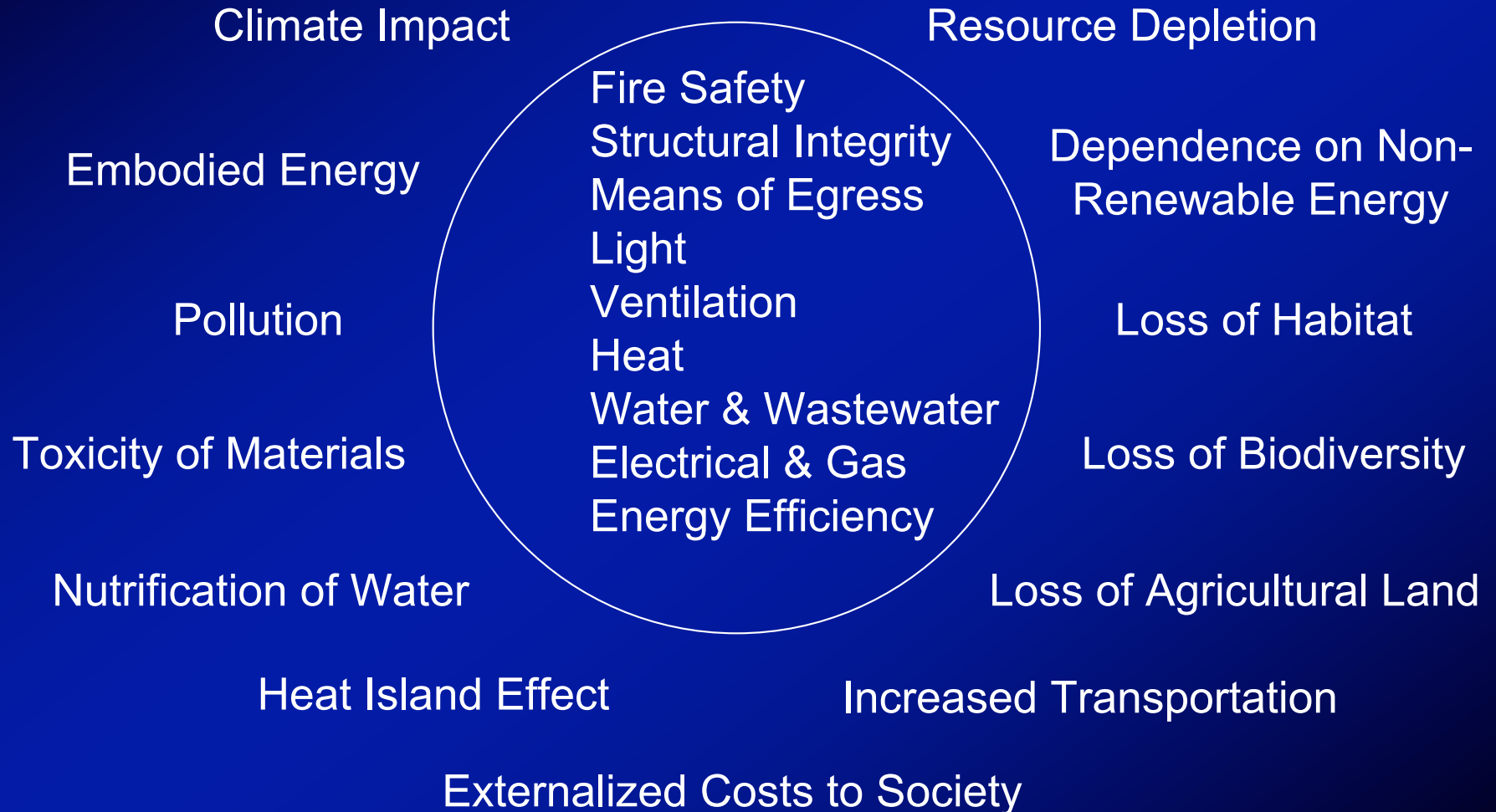
Risk - Through the Microscope of Codes...



Fire Safety
Structural Integrity
Means of Egress
Light
Ventilation
Heat
Water & Wastewater
Electrical & Gas
Energy Efficiency

Risk - The Bigger Picture...

Risks to Future Generations



This is OUR Current Situation...

We have a maze of varying regulatory structures, with an often conflicting and disconnected set of minimum standards to control what gets built...



We're designing and trying to build projects that surpass those minimums while taking on a set of huge risks not yet incorporated into regulations

Our Understanding of Risk is Bigger...

That projects seeking to meet all the existing minimum standards while addressing huge risks that have yet to find their way into regulations are a *problem for the regulatory system* is a clear indicator of *a problem with the regulatory system*.

Our Understanding of Risk is Bigger...

Our understanding of what is required to *safeguard public health, safety and welfare from hazards attributed to the built environment* - recognizing and attempting to balance the whole risk profile of a project - is larger and more comprehensive than the scope of concern or regulatory authority of any of the individual agencies or regulations that govern our projects.

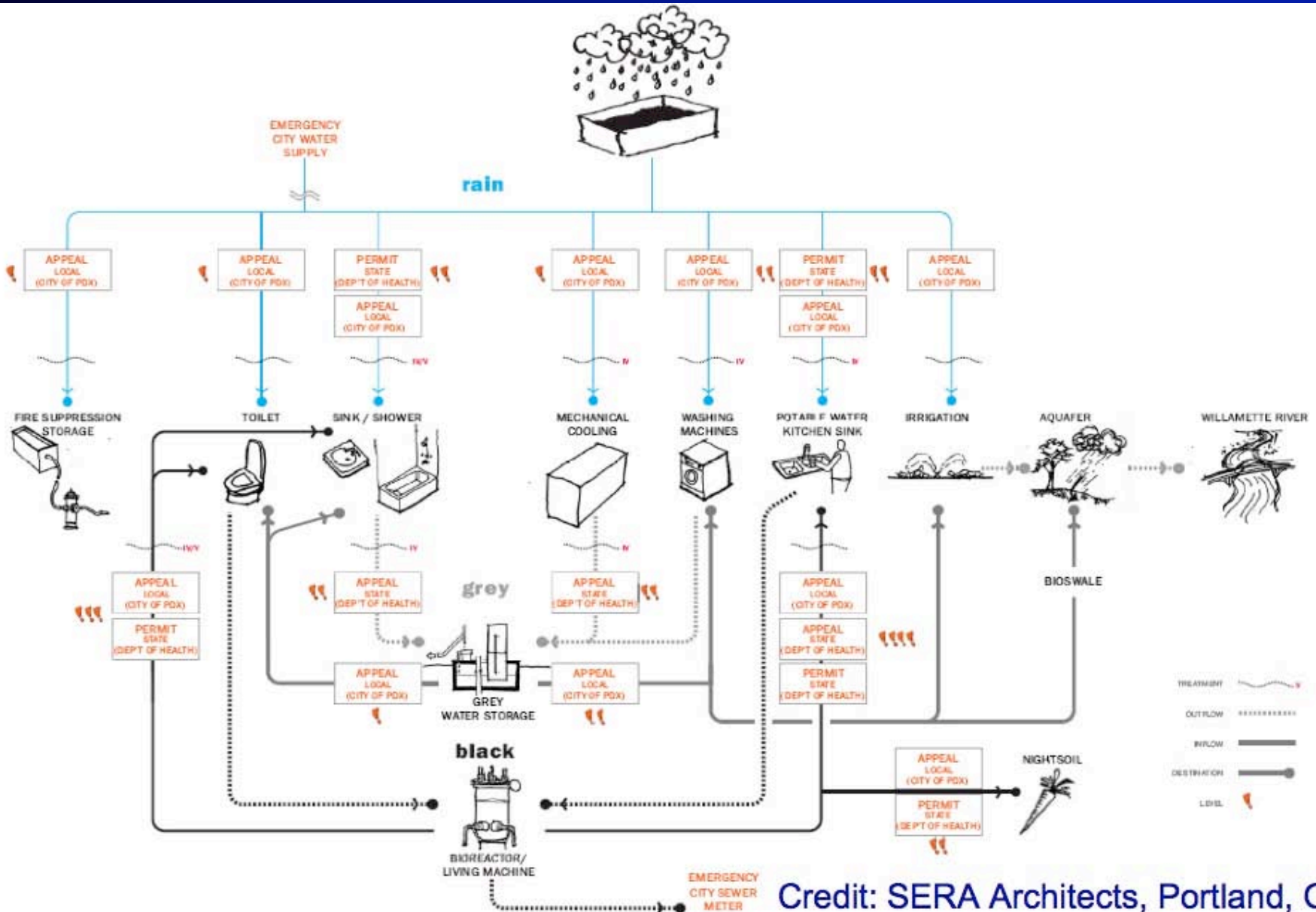
This is OUR Current Situation...



To achieve these higher goals, we use unfamiliar methods - so the regulators have a problem with our projects...

Big problem—it's not a "system." Regulatory responsibility/authority is broken into different jurisdictions, agencies, and departments, with rules, codes and standards varying from place to place—with approvals nested but not necessarily linked at each level.

An Example: a Water Approvals Maze



Credit: SERA Architects, Portland, OR

A Couple More Problems...

Codes and regulations are reactions to disasters, failures, or major past problems. They are about keeping bad things from recurring through the use of minimum standards.

It's *logical, important* and *insufficient*. A risk-averse mindset tends to view change (the unfamiliar) as at least as dangerous as known risks.

So the regulatory mindset tends to be nearly as effective at preventing the best things as the worst.

As Important, it Looks Back and Down...

The focus stays on *the Known* and on *Minimums*.

There's no built-in forward-looking, problem-seeking capability to address larger-pattern, systemic risk or risks of a new kind.

When such risks do arise, the system is often slow (or worse) in recognizing and starting to deal with them.

The agencies are typically under-funded and understaffed for their normal work load, let alone change.

What if the Minimum is the Maximum?

And here's the BIGGER QUESTION:

What if the large-scale risks we've created while looking through that microscope are large enough now that minimum requirement to "*safeguard public health, safety and welfare from hazards attributed to the built environment*" is the most we can do and the quickest transformation to sustainable practices we can achieve?

Buildings are Complex Systems of Systems

English does not contain a suitable word for "system of problems." Therefore I have had to coin one. I choose to call such a system a "mess." The solution to a mess can seldom be obtained by independently solving each of the problems of which it is composed. - Russell L. Ackoff

Or, more simply put...

Optimizing components in isolation tends to pessimize the whole system.

- Paul Hawken, Amory & L. Hunter Lovins

How to Not Pessimimize the System?

Building codes typically optimize components of a building in isolation, often pessimizing both the building and the systems to which it's connected.

To truly optimize buildings requires considering the whole system of systems. All technologies need to be viewed this way, to include their whole risk/benefit profile.

What Buildings Should and Shouldn't Do...

Building codes could be a set of principles for what buildings should and shouldn't do...

A good first principle would be a corollary of the Hippocratic Oath; buildings should first do no harm.

To consider the harm a building might do requires looking at the impacts from its entire lifecycle...

Acquisition of Resources through Demolition & Beyond



We Need to Ask New Questions about Risk

What?
Where?
To Whom?
When?
How?
How Long?
How Much?
Reversible?
Necessary?
At What Cost
and to Whom?
We can't get where we need to be by avoiding risk...



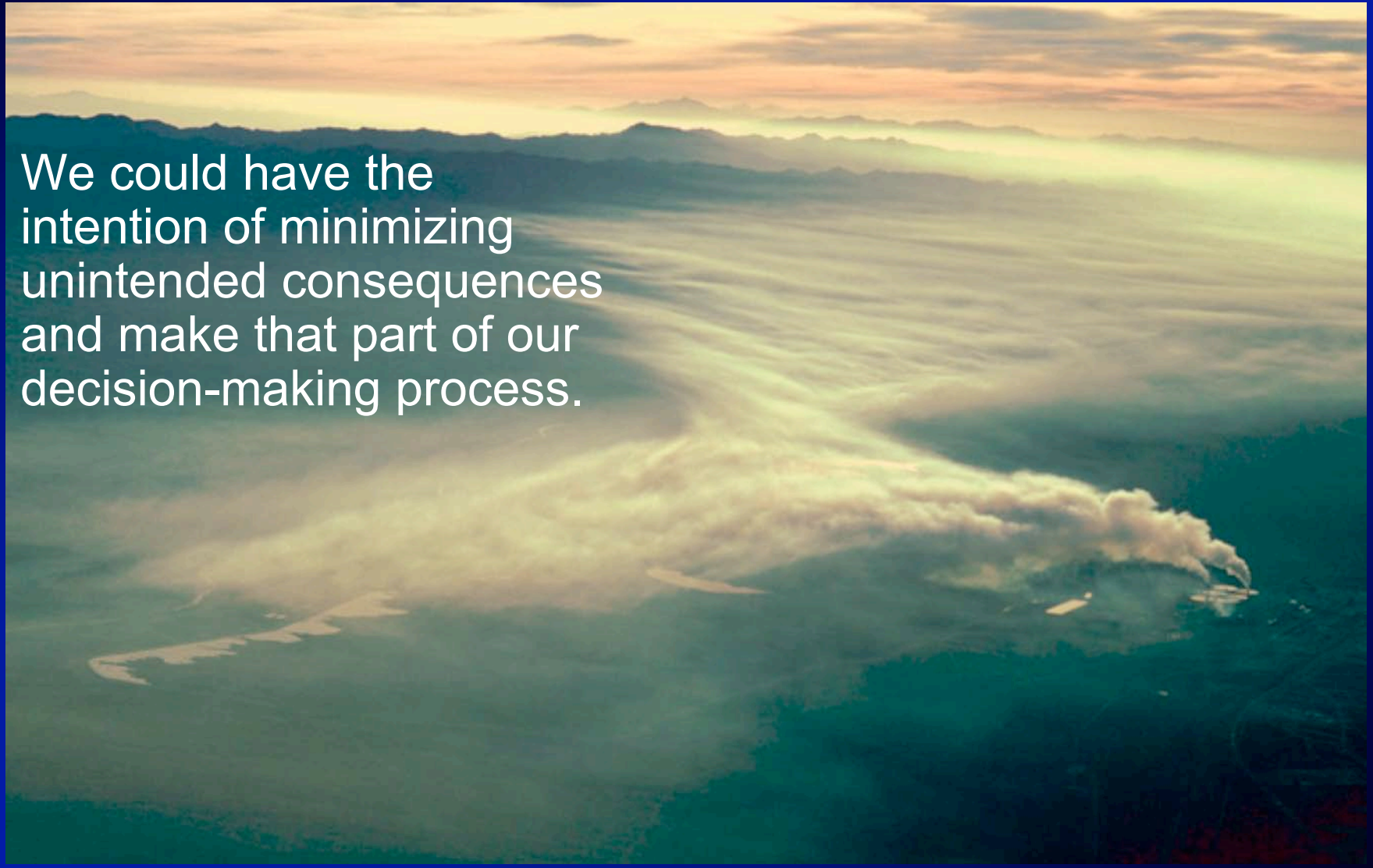
The Great Modern Myth

We need to recognize and address the great modern myth - that we know what we're doing and are in control. We don't and we're not...



Addressing the Great Modern Myth

We could have the intention of minimizing unintended consequences and make that part of our decision-making process.



Addressing the Great Modern Myth

Thinking deeply about our choices of materials and systems might lead us to develop a preference for doing things as locally as possible, as simply as possible, and doing as little as possible of those things that we know are harmful or about which our knowledge and understanding is limited.



A Place to Start

Appropriate technology - the lowest or simplest level of technology that can do the job well.

Appropriateness relates to where and for what purpose technology is used and the social, economic, and ecological context.

Truly appropriate technology doesn't make people or their communities dependent on systems over which they have no control. This means technologies that enhance the local capacity to meet local needs - in a lower energy world this is the foundation for security and sustainable communities.

Relocalization

Doing things locally is important for many reasons, but first and foremost, the feedback loops are shorter and much higher quality. You're much more likely to run into the unintended consequences of your actions.

Relocalization

If *security* is a goal, strengthening regional and local self-sufficiency is an essential strategy for us and for everyone else, everywhere else.

Enhancing the local capacity of people and their communities to meet their own needs, also:

- shortens vulnerable supply lines
- creates more robust & resilient supply systems
- supports vital, durable local economies, and
- supports healthy cultural, political, and social structures

Relocalization

When we don't have inexpensive, abundant energy to drag materials around the world, process them as much as we imagine we need to, and then drag them around some more, it will become crucial that we learn, once again, how to use well those resources that are available to us where we live...

The rules and the way we think about risk and benefit will have to change - to become more nuanced, more inclusive, and more responsive.

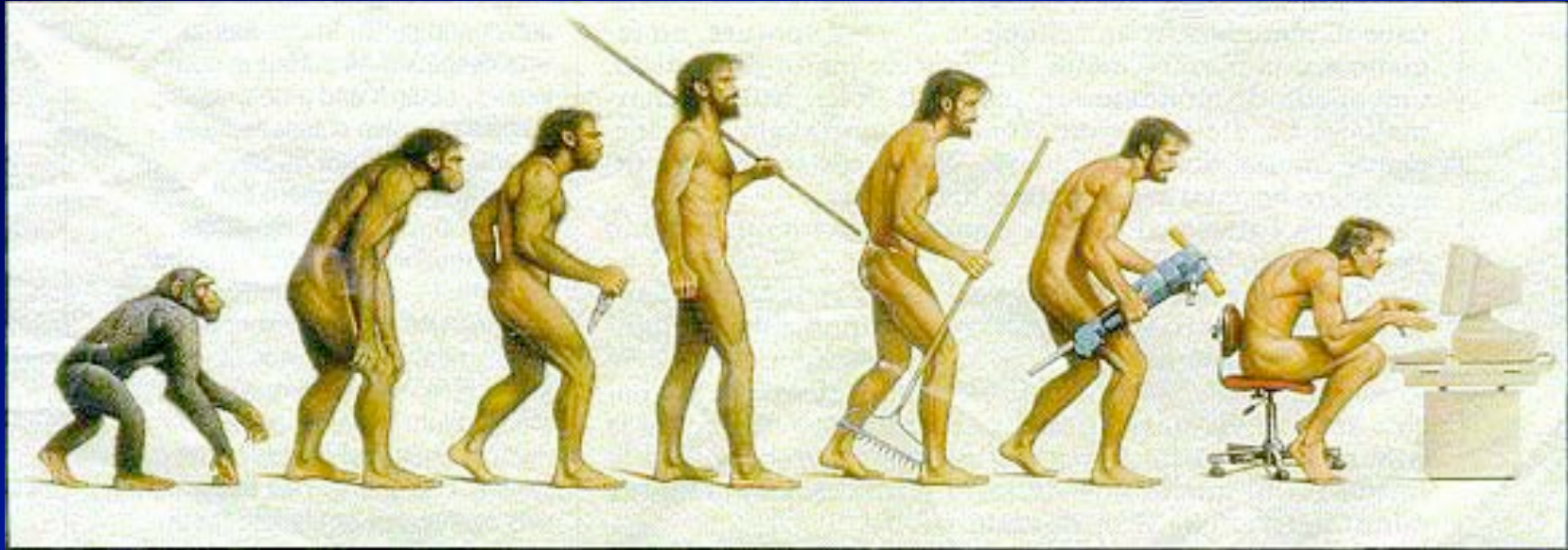
Some Tools and Resources

The relocalization movement is a key part of the shift toward sustainable development and true security. This includes energy, materials, food, economic development and more. Check out these websites for more information:

www.relocalize.net

www.postcarbon.org/informed/relocalization

And We Keep Asking Questions...



Why do all our systems appear to be designed to make the world safe for technology and capital?

Making the World Safe for Technology?

What if we understood that our task as human beings on this planet is to make the world safe for all life forever...



Some Questions We Should Be Asking

Does this choice or action:

enhance or undermine your capacity to meet your needs locally/regionally?

create benefit without making you dependent on systems over which you have little or no control?

transfer wealth out of the community?

embed you and others in your community or displace or compel people to become transient?

Some Questions We Should Be Asking

Does this choice or action:

enhance or destroy equity - both the social and cultural equity related to fairness and justice, and the tangible physical/economic benefits of belonging to and being "invested in" a place-based community?

promote or undermine health - your health, the health of your family, your neighbors, your community, region, nation and the health of people and living systems anywhere in the world?

Some Questions We Should Be Asking

Does this choice or action:

increase or decrease the level of unintended consequences flowing from what you are doing?

increase or decrease your awareness, comprehension and ability to mitigate the unintended consequences of what you are doing?

bring people together or drive them apart?

Some Questions We Should Be Asking

Does this choice or action:

cause offense, concern, or harm?

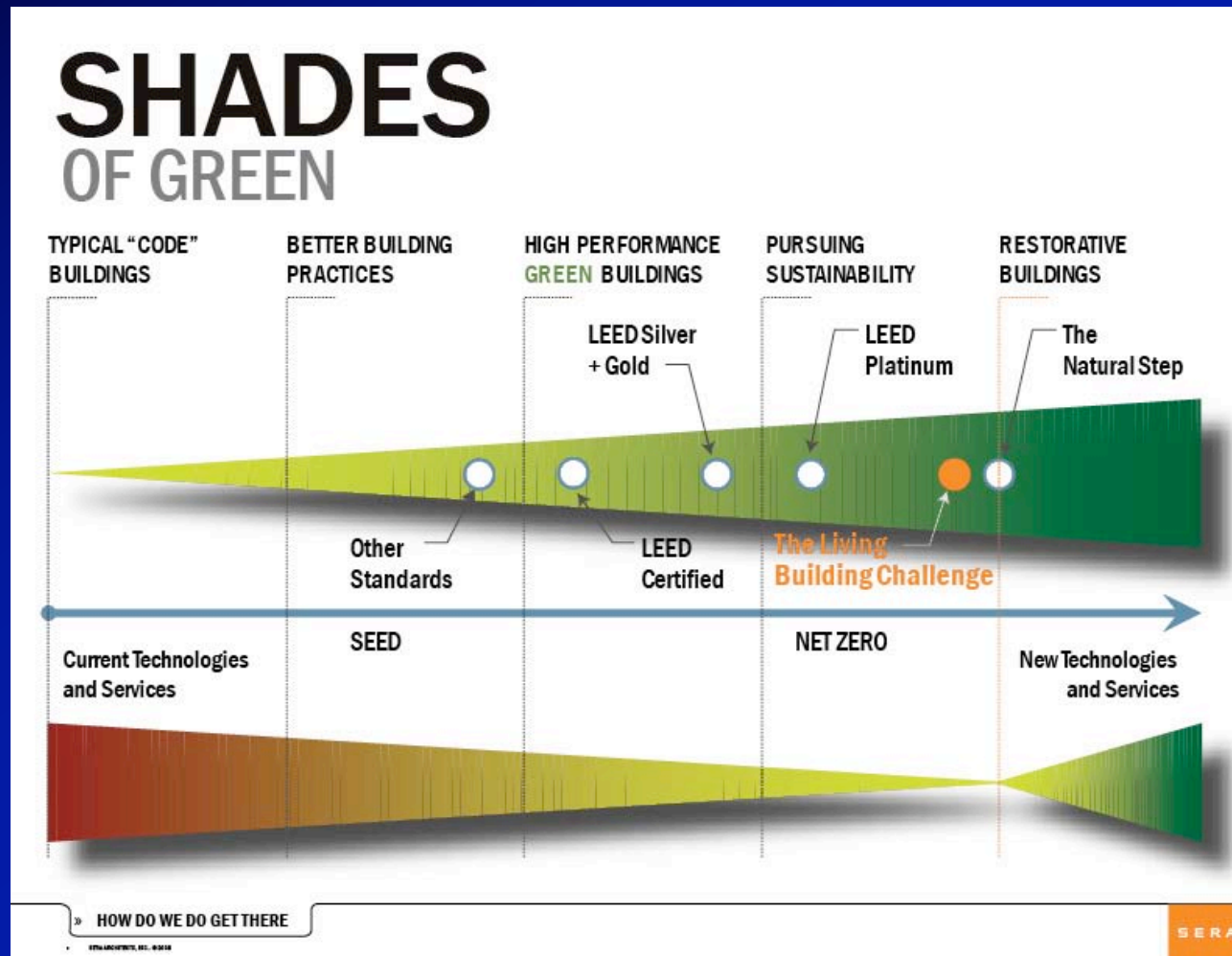
bring joy and/or satisfaction to you and to everyone effected by it?

The Task Before Us...

We have to acknowledge that there are risks in all that we do. Until we can see the whole risk profile, however, we will not be able to make good decisions about which risks are worth taking.

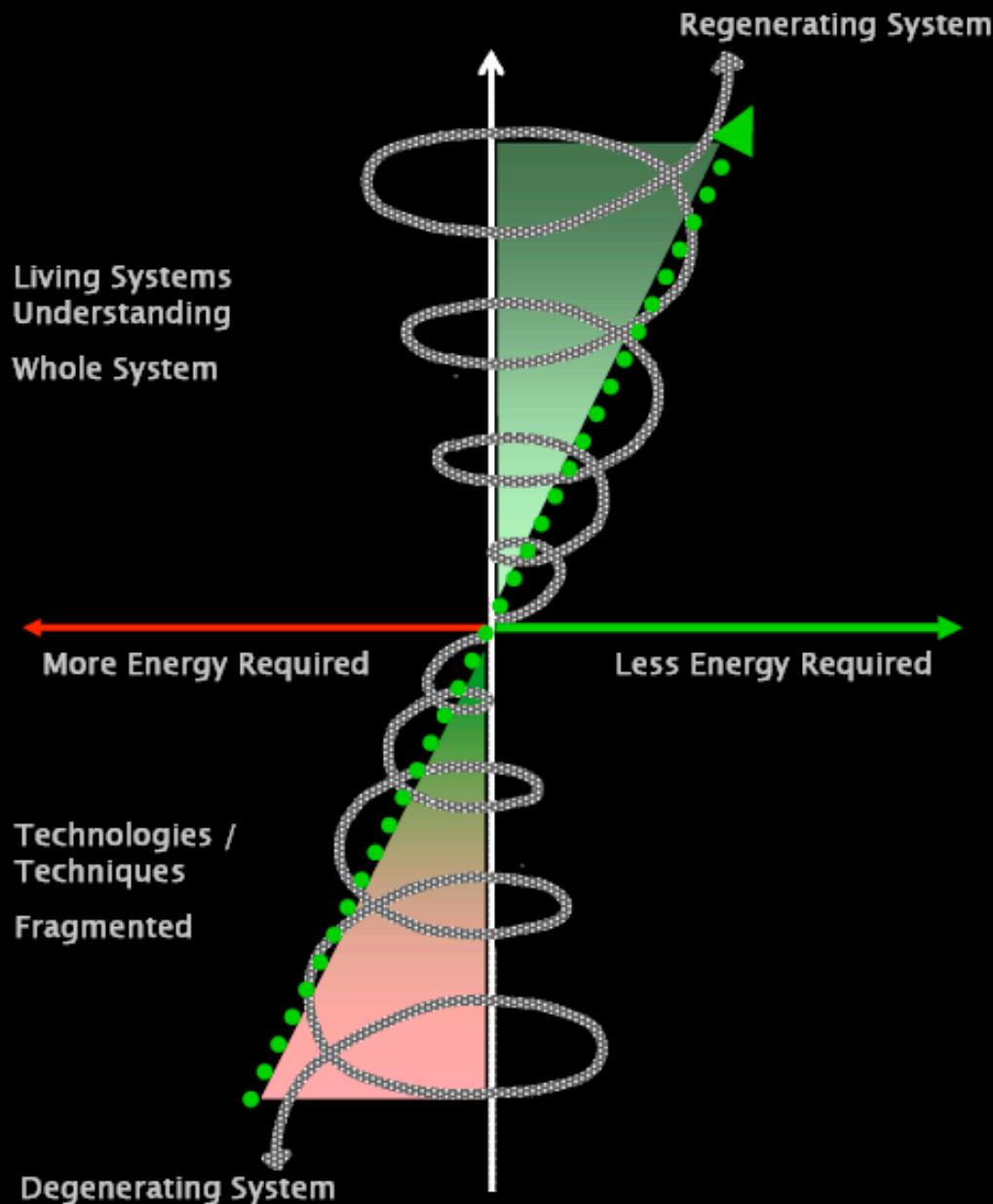
Our task is to keep revealing what we now know is true, not claiming that what we do is risk-free. We need to make clear that we've recognized a much larger set of risks than the regulators and we're trying to address them as well as their concerns.

The Larger Context



Source: SERA Architects, Portland, OR - 2008

Development Center for Appropriate Technology - 2008



Regenerative

Humans (Hominids)
PARTICIPATING AS nature –
 Co-evolution of the Whole
 System

Restorative

Humans **DOING THINGS**
TO nature – assisting the
 evolution of Sub-Systems

Sustainable

Neutral –
 “100% less bad” (McDonough)

Green

Relative Improvement
 (LEED, GB Tool, Green Globe, etc.)

Conventional Practice

“One step better than
 breaking the law” (Croxtan)

Trajectory of Environmentally Responsible Design



Truly restorative and regenerative projects demand a fundamentally different mindset; a commitment to honor the essence of each place we inhabit and to enhance the evolutionary capacity, vitality and health of both the natural and human systems.

The Living Building

The metaphor of the flower...

- Harvests all its own energy and water
 - Adapted to climate and site
 - Operates pollution free
 - Promotes health and well-being
 - Comprised of Integrated Systems
 - Is Beautiful
- www.cascadiagbc.org/lbc



The Living Building Challenge
In Pursuit of True Sustainability in the Built Environment

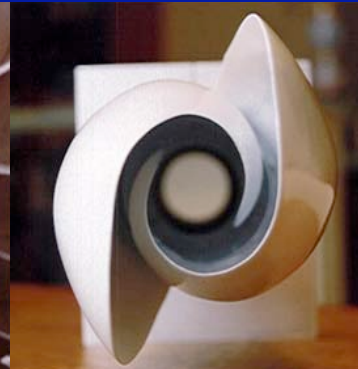
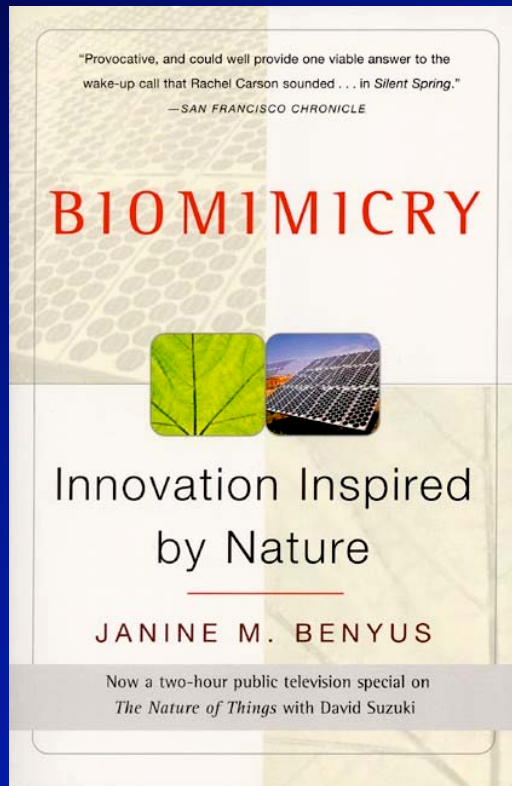


Summary of Prerequisites

Number	Category	Prerequisite
One	Site Design	Responsible Site Selection
Two	Site Design	Limits to Growth
Three	Site Design	Habitat Exchange
Four	Energy	Net Zero Energy
Five	Materials	Materials Red List
Six	Materials	Carbon Footprint
Seven	Materials	Responsible Industry
Eight	Materials	Appropriate Materials Radius
Nine	Materials	Construction Waste
Ten	Water	Net Zero Water
Eleven	Water	Sustainable Water Discharge
Twelve	Indoor Environmental Quality	Civilized Work
Thirteen	Indoor Environmental Quality	Source Control
Fourteen	Indoor Environmental Quality	Ventilation
Fifteen	Beauty & Inspiration	Design for Spirit
Sixteen	Beauty & Inspiration	Inspiration and Education

Why Not Look at How We Got Here?

www.biomimicry.net/





Builders Without Borders



Networking Natural Builders Worldwide

Home

Builders Without Borders

is an international network of ecological builders who advocate the use of straw, earth and other local, affordable materials in construction. We believe that the solution to homelessness is not merely housing, but individuals and communities trained to house themselves.

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To this end, we organize and promote hands-on [workshops and learning events](#), create [educational books, CD-ROMs and videos](#), and [partner with other organizations](#) to build affordable sustainable housing. Since our inception in 1999, we have organized and supported projects from Mexico, to Israel, South Africa, Siberia, and Mongolia, and Native American land... ([read more](#))

Free Email Newsletter

For announcements of upcoming projects and workshop opportunities, sign up for our [email newsletter](#).

Strawbale Construction comes to Washington D.C.



photos: Catherine Wanek



<http://builderswithoutborders.org/>





Photograph: Bill Steen



Next Friday, June 20
Senate Office Building
Washington, D.C.

Laura Bartels,
Bob Gough,
Sandy Wiggins, and
me...

Look for the audio
recording and
presentations at
www.eesi.org

Straw-Bale Construction: Harvesting Its Potential As an Affordable and Energy-Efficient Building Strategy

Friday, June 20, 2008
10:00 a.m. - 11:30 a.m.

485 Russell Senate Office Building

The **Environmental and Energy Study Institute (EESI)** invites you to learn how the "new but old" method of straw-bale construction can help address some of our most serious national policy challenges, such as record energy prices and unemployment, inadequate supply of affordable housing, the threat of climate change, and pressing needs in transportation and infrastructure funding. The modern building industry places heavy demands on the energy and transportation sectors. Straw is a locally-sourced, widely available, and renewable resource that builders, architects, engineers, and home owners are turning into affordable, safe, durable, and energy-efficient buildings in many climates. The following presenters will discuss the benefits of using this American invention, the regulatory barriers and institutional biases against straw-bale construction, and the role of the federal government in resolving these issues:

- **Laura Bartels** — President of GreenWeaver Inc., Builders Without Borders Building Team, is a builder and educator who consults on residential, commercial, industrial and institutional straw bale structures.
- **Bob Gough** — Secretary of Intertribal Council On Utility Policy, is seeking affordable and healthy housing solutions and the creation of new jobs for reservations through the use of indigenous building materials.
- **Sandy Wiggins, LEED AP** — Principal, Consilience LLC and Immediate Past Chair, U.S. Green Building Council (USGBC), is a "green" architect and developer.
- **David Eisenberg** — Director, Development Center for Appropriate Technology, is chair of the U.S. Green Building Council's Codes Committee and has authored numerous articles about straw-bale building issues.

Local, Renewable Resource

Like the pioneers of the late 1800s who settled in the nation's Great Plains and baled prairie hay to use as a building material, today's pioneers in green building recognize that straw (the stalk that remains after the harvest of wheat, rice, and other grains) has many benefits as a building material but often is underutilized or regarded as waste. Some straw is incorporated back into the soil to ensure soil productivity, some is used for animal bedding, and much is burned in the field, which has raised concern about air quality, visibility, and release of carbon dioxide back into the atmosphere. This has created renewed interest in finding alternative uses of straw. According to the U.S. Department of Agriculture's Economic Research Service, about 78.5 million tons of wheat and rice were produced on average during 1990 to 1996. During that same period, about 123 million tons of straw were produced *annually*. It is estimated that between 125 and 177 million tons of straw are available each year from all grain crops, a significant percentage of which could be available for construction.

Buildings' Impact on the Environment

Buildings consume one-fourth of the world's wood harvest and one-sixth of its fresh water usage. In the United States, more than 40 percent of the primary energy produced annually is used to heat, cool, light, and operate our homes, offices, schools and other buildings and to manufacture and transport building materials. Building operation accounts for 39 percent of annual U.S. carbon dioxide emissions, and an additional eight percent of greenhouse gas emissions can be attributed to the extraction, manufacture, transportation and assembly of building materials.

Open House at the Straw-Bale Eco House Exhibit

At 1:00 p.m. following the briefing, there will be an Open House at the Straw-Bale Eco House exhibit built by Builders Without Borders as part of the U.S. Botanic Garden's "One Planet-Ours!" summer-long sustainability exhibition. *Strawberry* ice cream will be served! The exhibit is located on First Street, SW, near Independence Avenue, across from the U.S. Capitol. A hands-on Straw-Bale Building Workshop will be taught as part of the U.S. Botanic Garden Family Day at the same location on Saturday, June 21st from 10 a.m. - 4:30 p.m.

This briefing is open to the public; no RSVP is required. Please feel free to forward this notice. For more information, contact Ellen Vaughan at 202-662-1893 or evaughan@eesi.org.

A Focus Shifting Template - The Usual Stuff



The list of things
that always hold
your attention

A Focus Shifting Template - ~~What's Missing~~

Things you used to think about

Linkages to related realms

Linkages to unrelated realms

Internalized risks

Externalized risks

Unintended
Consequences

The list of things
that always hold
your attention

Delayed impacts

Internalized benefits

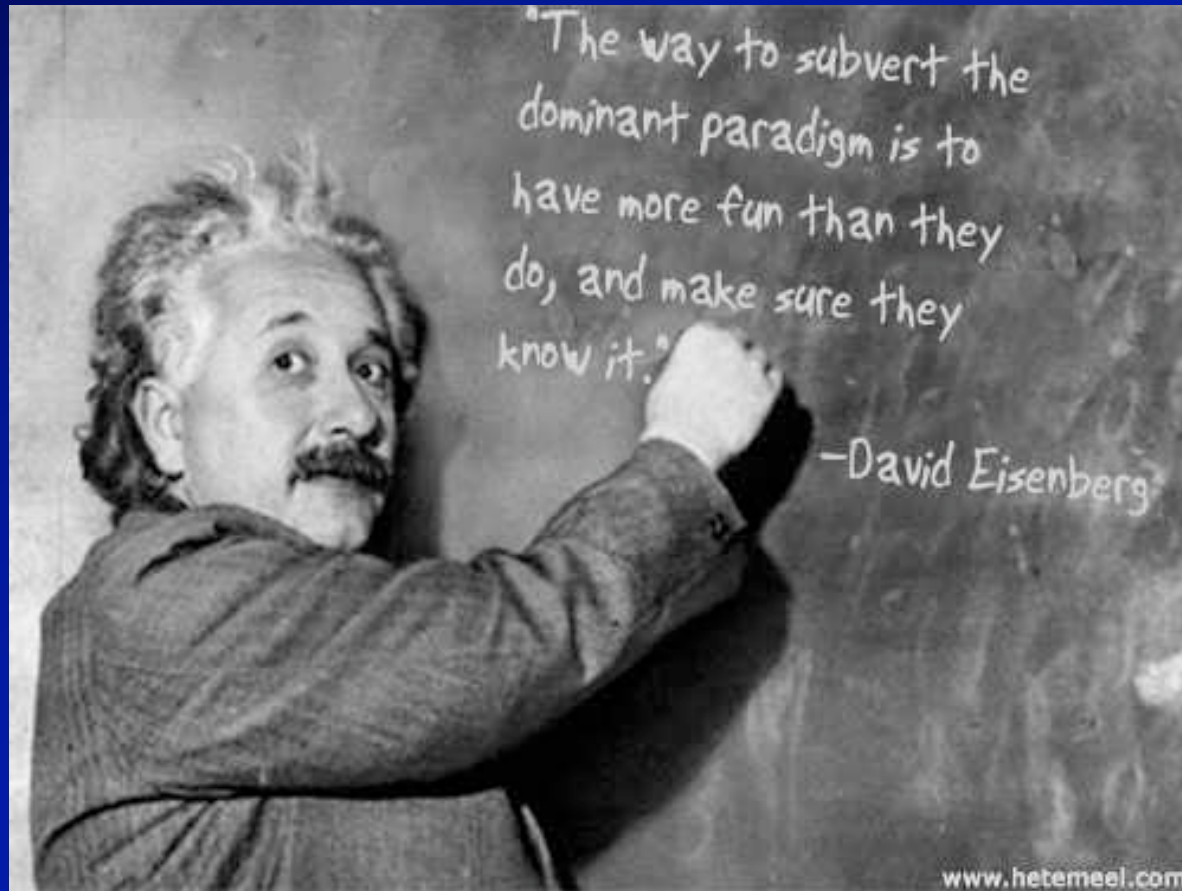
Externalized benefits

Important stuff you
don't yet know

Important stuff you
know that isn't true

Things you never thought about but should

And Remember -





Thank you!

Development Center for Appropriate Technology
P.O. Box 27513, Tucson, AZ 85726
(520) 624-6628

Or to contact David Eisenberg directly:
strawnet@aol.com

And please visit our website:
www.dcat.net

DCAT is a 501(c)(3) Non Profit Organization