Can We Create a Regulatory "System" for Our Global Systemic Challenges?

SB08 - Special Forum 17
Global Building Regulations and Sustainability
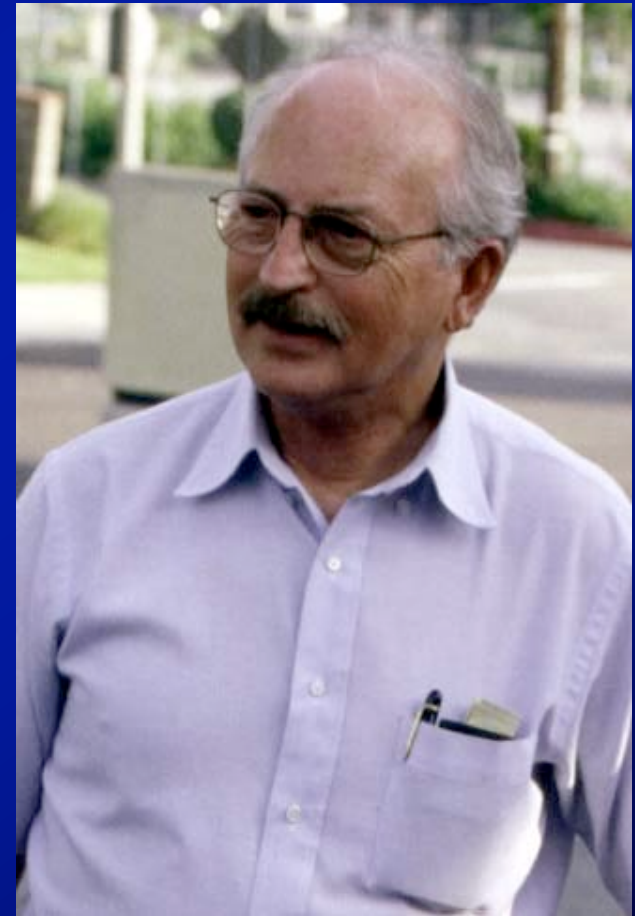
September 24, 2008 - Melbourne, Australia

David Eisenberg
Director
Development Center for Appropriate Technology

The Larger Context…

"Safety is very important, but we need to think about the responsibilities for our collective safety; especially the welfare of future generations who, it's worth noting, are unable to represent their own interests."
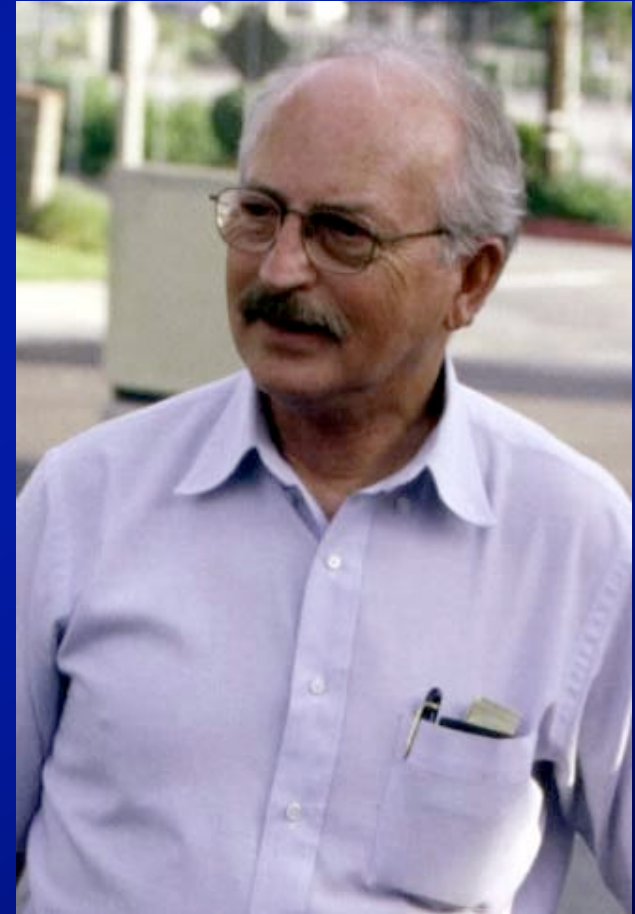
Bob Fowler, FAIA, P.E., C.B.O.
Founding Chairman of the International Code Council (ICC)

A Favorite "Fowlerism"

"Our job is to solve complicated problems,

not complicate solved problems."

Bob Fowler, FAIA, P.E., C.B.O.
*Founding Chairman of the International Code Council (ICC)*

The Larger Context…

We've been given ample information at this conference about the seriousness of the situation we face in regard to climate change, energy, water and other critical resources, ecosystem health, and development, population and economic pressures, so I won't spend any time on them.
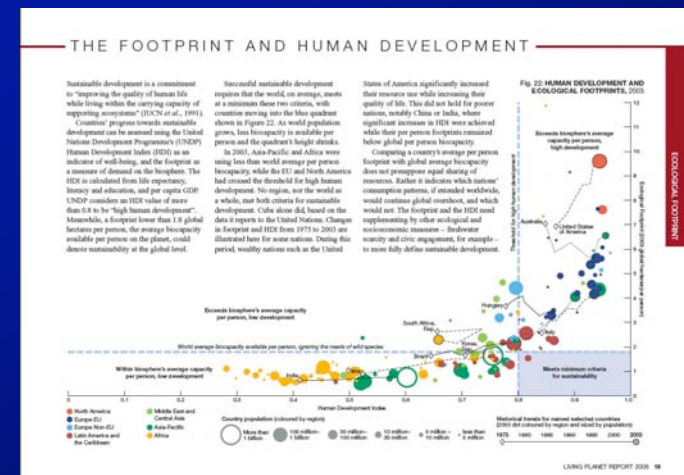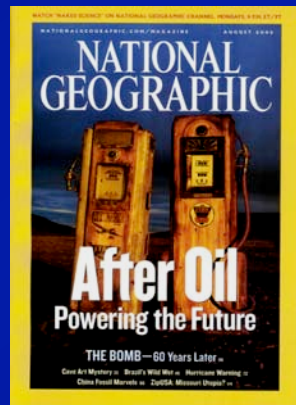
Larger Context: Just the Tip of the Iceberg

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

The magnitude of what we're facing is daunting. The good news is we've overcome inertia, many things are now moving in the right direction…
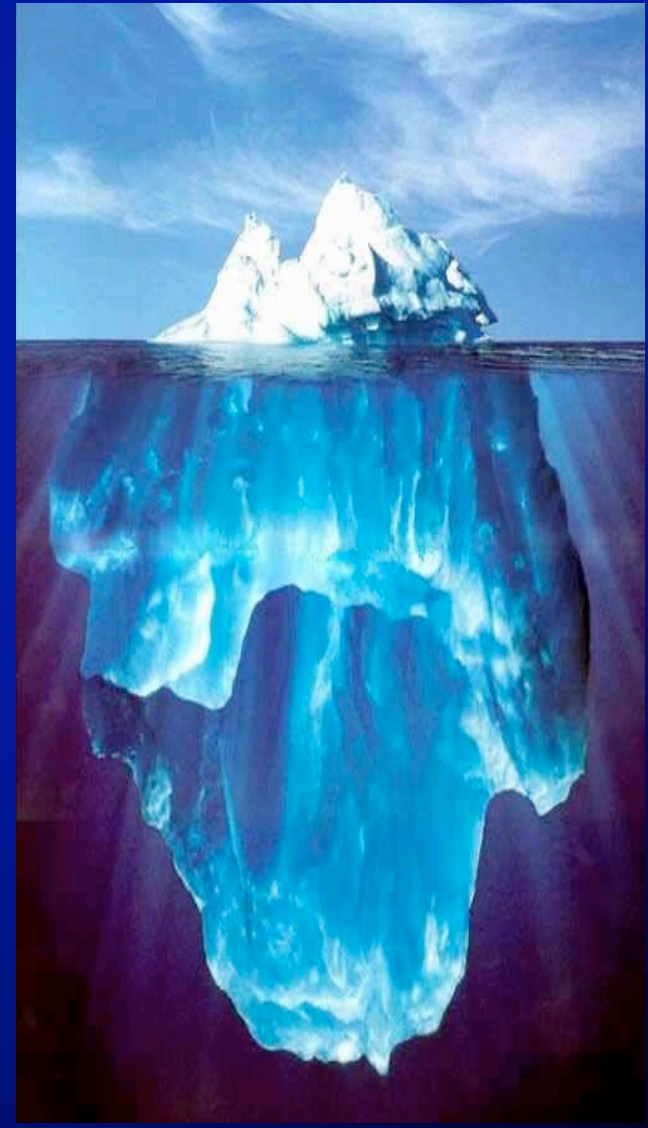
Critical (and No Longer Valid) Assumptions…

• A stable and predictable climate.

• Adequate and affordable key resources including energy, water, food and other critical resources.

• The natural systems on Earth are robust enough to withstand whatever humans may choose to do.

• Our current economic systems can meet the needs of all people and enable the transition to a sustainable future.

• Our social and political structures & interpersonal skills are adequate for the coming changes.

The Larger Context

Crucial shortcomings exist in the building regulatory realm, many of which result from the nature of the regulatory paradigm itself.

Understanding that nature and its limitations is an essential step in creating what we now urgently need - a regulatory "*system*" capable of *enabling* the rapid and deep transformation of the built environment now necessary for humanity to survive and thrive on this small planet.

The Larger Context

Though we often use terms like "*building regulatory system,*" we have yet to create a regulatory *system* for the built environment.

Such a *system* would have *system principles, goals, and a coherent, comprehensive, and intentional structure* that defined the *relationships* between the *whole* and the *parts of the system* and recognized its relationships to other human and natural systems.

The Current Situation

We have a maze of regulations and regulatory structures with often conflicting and disconnected minimum standards to control what gets built…

Regulatory responsibility and authority is divided into separate jurisdictions, agencies, and departments. Rules, codes and standards vary from place to place, as does enforcement...

The Current Situation

JURISDICTIONAL LEVELS

Regional/National/Global

The State/Province

The County

The Municipality

The Neighborhood

The Site/Component/Building Level

There are both gaps and overlapping jurisdictional authority. Where there are regulatory gaps, the risks typically are externalized to the commons and to the future.

Where there is overlapping authority the tendency is either for great complexity in regulatory compliance or for neither regulatory entity to take full responsibility.

A Deeper Set of Problems

Codes and regulations are reactions to disasters, failures, or major past problems persistent and widespread enough to require official action. They set minimum standards to try to keep those bad things from happening again.

This is *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.

A Deeper Set of Problems

Because regulations are only created *after* problems exist and have grown large they rarely deal with problems when they are small, manageable, and more easily avoidable.

There is no forward-looking, problem-seeking capability built into the system to address emergent risks, larger-pattern systemic risks, or risks of a new kind.

A Deeper Set of Problems

The main navigational tool in
the regulatory arena is the
rear view mirror…

A Deeper Set of Problems

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

As important - regulatory agencies are typically chronically under-funded and under-staffed (and often under-trained as well) for their normal work load, let alone being able to deal effectively with change or new responsibilities.

A Deeper Set of Problems

Beyond all that, regulators are "regulated" by politics, policy-makers, the influence of special interests, economic forces and constraints, public opinion, and more.

And they are necessarily constrained by the limitations of the regulations they are required to enforce - which are typically not of their own making.

An Example: a Water Approvals Maze

Credit: SERA Architects, Portland, OR
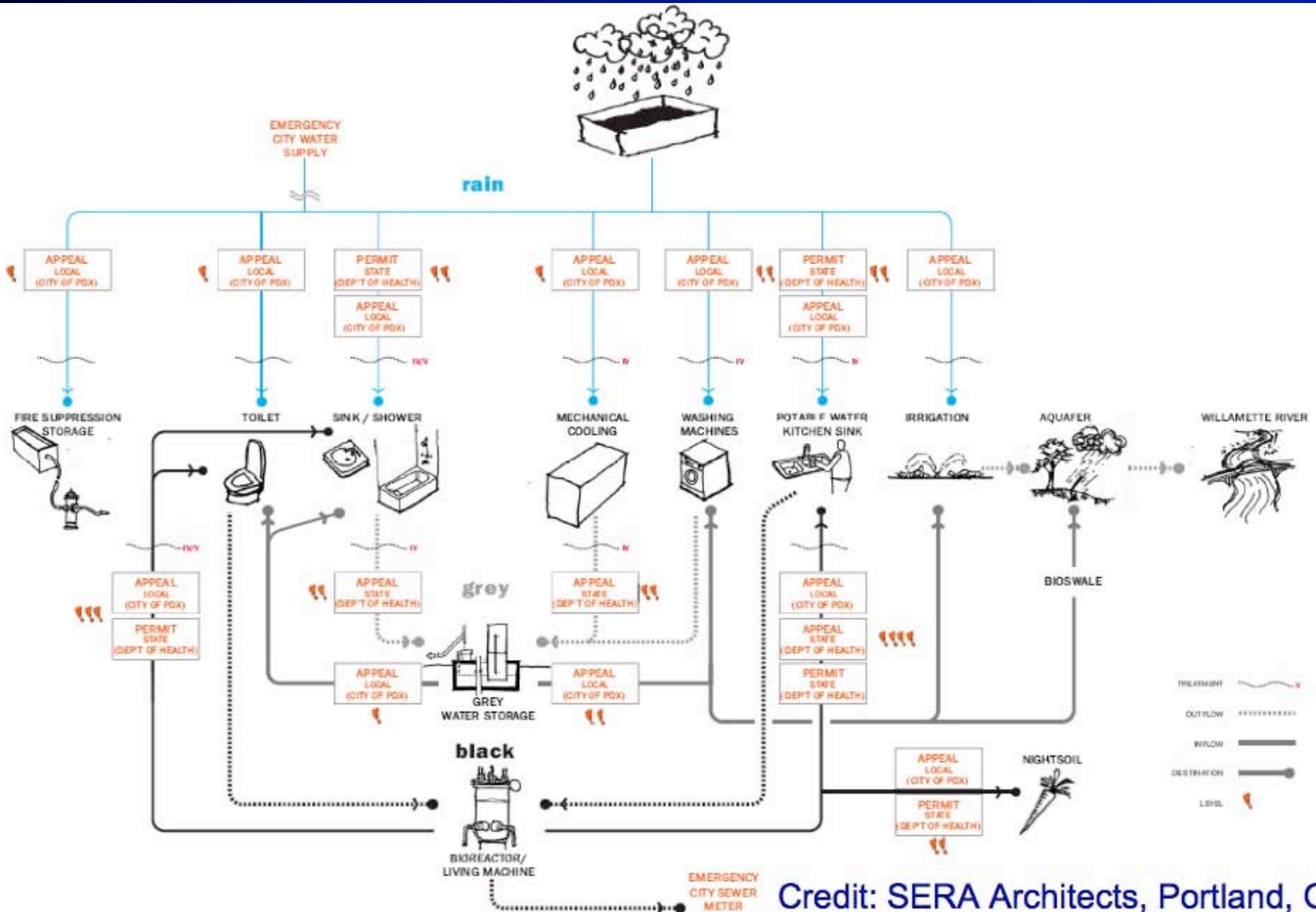
We are at a Crossroads

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**…

Sometimes Bigger IS Better

We 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.
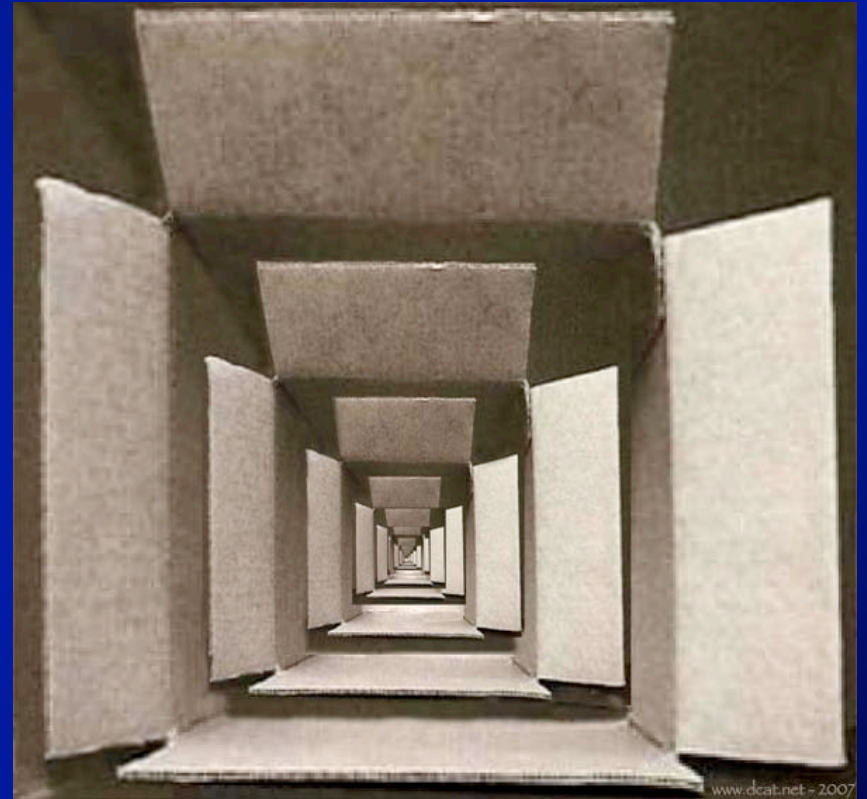
It's Always BOTH Details AND Big Picture

It's critical to always know your frame of reference - are you working in the details or big picture? Past, present or future? Keep shifting your focus back and forth.

That's the only way to keep your work in perspective and proportion: to see both the *things* and 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…Now?

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…Now?

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

- away from the building site, and

- into the future.
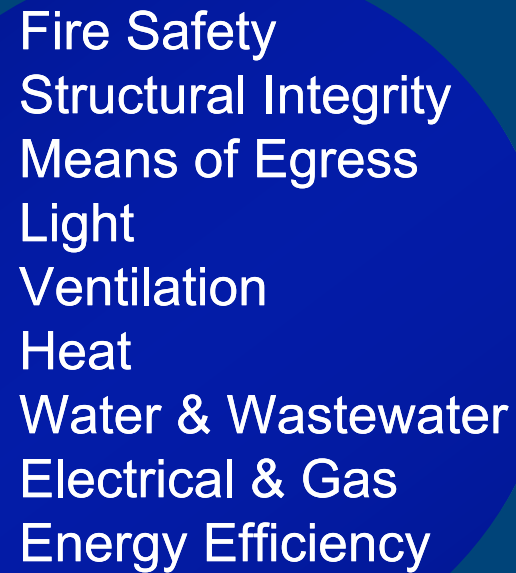
Big Problems Hidden in Plain View

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

But, it's like we've dealt with risk with tweezers, while creating 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

Climate Impact

Embodied Energy

Pollution

Toxicity of Materials

Nutrification of Water

Heat Island Effect

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

Resource Depletion

Dependence on Non-
Renewable Energy

Loss of Habitat

Loss of Biodiversity

Loss of Agricultural Land

Increased Transportation

Externalized Costs to Society

Mostly Falling Through the Cracks…

Impact Assessment: Making the Connection from LCI to Entities Needing Protection

Environmental mechanisms

Emissions	Midpoint categories	Endpoint categories	Areas of protection
SOx	Human toxicity	Cancer	Human health
NO₂	Accidents	Respiratory disease	
TCDD	Noise	Acute injury	Biotic & abiotic natural environment
CO₂	Oxidant creation	Skin cancer	
HCFCs	Ozone depletion	Thermal stress	
Noise emission	Climate change	Infectious diseases	Biotic & abiotic manmade environment
NMVOC	Acidification	Starvation	
Total P	Nutrification	Natural disaster	
Total N	Ecotoxicity	Forestry	Biotic & abiotic natural resources
Land use	Land use and habitat losses	Crops	
Copper	Species and organism dispersal	Land loss	
Oil	Natural resources consumption	Fishery	
Waste	Waste	User cost	

Source: Jolliott O et al. (2004): "The LCIA midpoint-damage framework of the UNEP-SETAC life cycle initiative," Int J of LCA 9 (6) 394-404.

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

And perhaps more importantly…

Optimizing components in isolation tends to pessimize the whole system.
- Paul Hawken, Amory & L. Hunter Lovins

We've Designed a Pessimizing System

To truly optimize buildings requires considering the whole system of systems in design and regulation.

To achieve that, codes could be a set of principles for what buildings should and shouldn't do.

A good *first* (not *only*) *principle* would be a corollary of the Hippocratic Oath; *buildings should first do no harm*.

That requires looking at the impacts from their entire lifecycles…

Acquisition of Resources through Demolition & Beyond

Is the New Minimum the Maximum?

My View:

The large-scale risks we've allowed to grow while looking through the microscope are now so large and urgent that the minimum requirement to *"safeguard public health, safety and welfare from hazards attributed to the built environment"* is the most fundamental and rapid transformation to sustainable practices we can achieve.

Current Situation

Many projects designed to meet or exceed all those current minimums while addressing the set of enormous risks many of which have yet to be incorporated into the regulatory framework meet with great regulatory resistance.

This is because they use unfamiliar methods to achieve these higher, more deeply integrated goals. That these projects are a problem for the regulatory system is a good indicator of a problem in the regulatory system.

No One Wants to Build Unsafe Buildings

We share common goals. No one wants to create unsafe projects.

But how do we deal with projects whose proponents are working from a bigger definition of what it means to safeguard public health, safety and welfare—by examining and attempting to balance the whole risk profile of a project?

This is a New Starting Point

We need to acknowledge that accelerating rates of change will increase certain kinds of risk.

How do we create an appropriately balanced, flexible, and responsive regulatory system that doesn't impede the crucial changes that we need, *or* compromise public health and safety?

Codes are a Gate, Officials the Gatekeepers

The green building community needs to invite the regulatory community into their work and involve themselves more fully in the work of the regulators so that together we can figure out how to do this.

For changes in the built environment, codes are the gate and code officials are the gatekeepers.

The solutions are going to be more community- and place-based. They'll require more local knowledge and intelligence. Information technology can help more appropriately fit the regulations to the place-based needs.

This is a New Starting Point

Demonstration and experimental projects seeking to achieve these higher goals need a regulatory structure that supports multiple iterations, with appropriate review and monitoring to provide real-time research results.

This calls for a new partnership to accelerate learning about how these systems work and fail in the real world, in a process that transforms practice as rapidly as possible.

An Example…

Imagine if plan reviewers and other regulators were trained in integrated design in order to:

– have the benefit of their knowledge, perspective and concerns throughout the critical design development phase instead of afterward, and

– enhance their understanding of the deeper goals, critical relationships and system dependencies of these projects, and the need to maintain the integrity of integrated designs through the approvals process.

Building Police or Community Resource?

Great things happen when building officials and other regulators go from viewing their role as policing the bottom…

to

seeing themselves as community resources enabling the best things to happen while also preventing the worst.

That shift in thinking opens the door to a deeper conversation about these larger pattern risks and how to deal with them.

Moving Forward

What is becoming apparent is that it will take much more than just "fixing" or "greening the codes."

We need a much more systemic basis for the whole regulatory and approvals process.

The transformation that is taking place in the design, development and building communities must be paralleled in the regulatory realm.

Moving Forward

The context is crucial. In the same way that we are seeking to incorporate the larger set of risks, recognition of unintended consequences, and higher goals and aspirations into our designs and projects, we must begin to educate and support the regulatory entities in following this same path.

It may be rocky at the start but it's crucial and essential work we're all called to help achieve. This is the start of a new way of thinking and acting…

Beyond Risk Management

Truly restorative and regenerative projects demand a fundamentally different mindset; a commitment to honor the essence of each place we inhabit. This is about relationships not just managing risks.

But When We Do Consider Risks…

What Risk?
Where?
To Whom?
When?
How Long?
How?
How Much?
Is It Reversible?
Is It Necessary?
At What Cost
and to Whom?
(not just monetary)
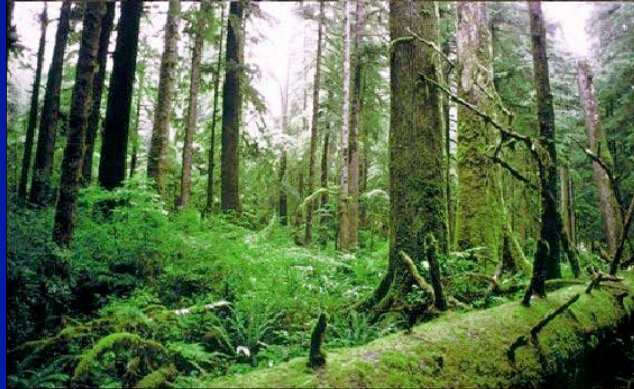
The Great Modern Myth

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.
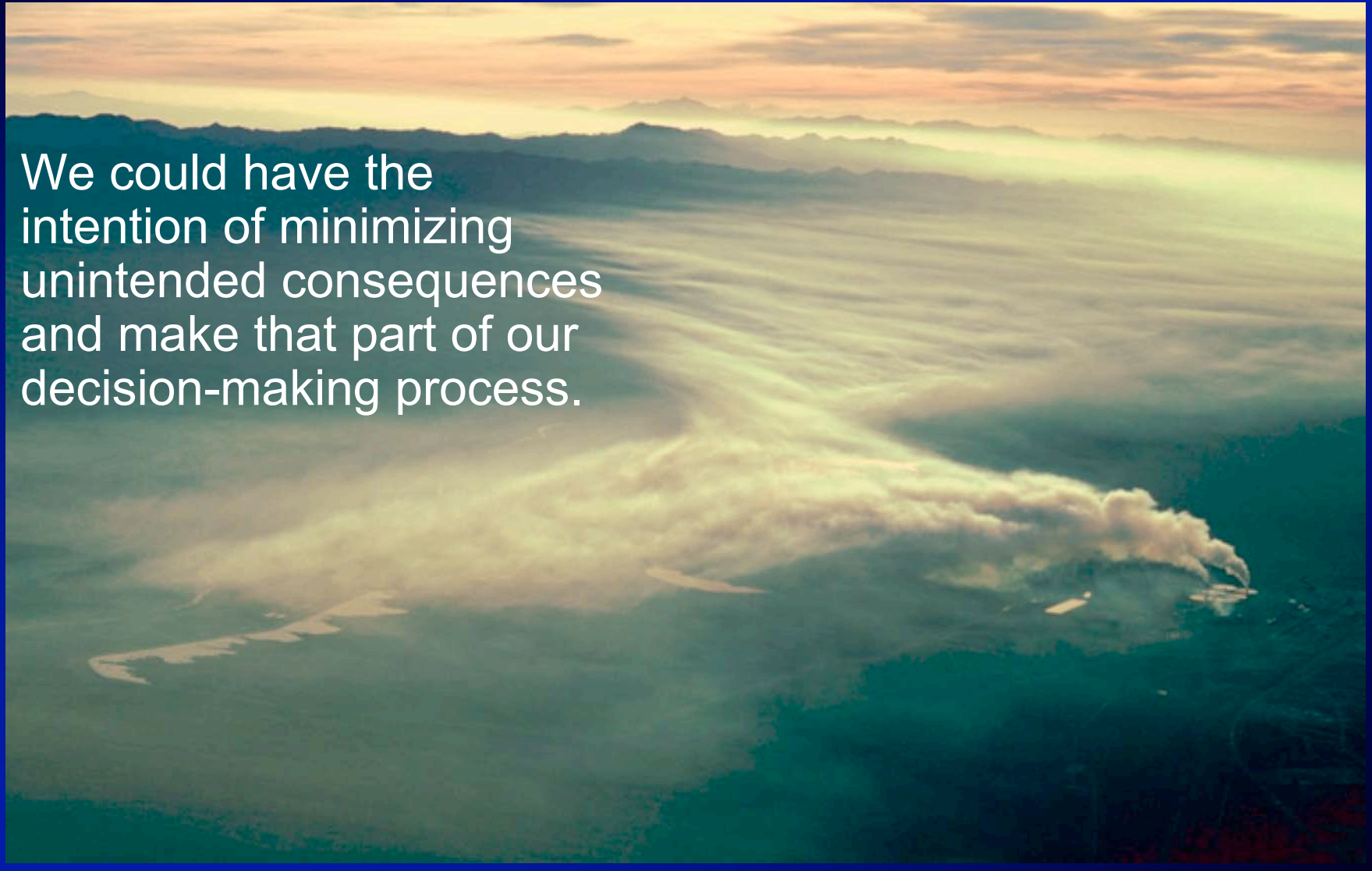
Addressing the Great Modern Myth

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.

The Larger Context
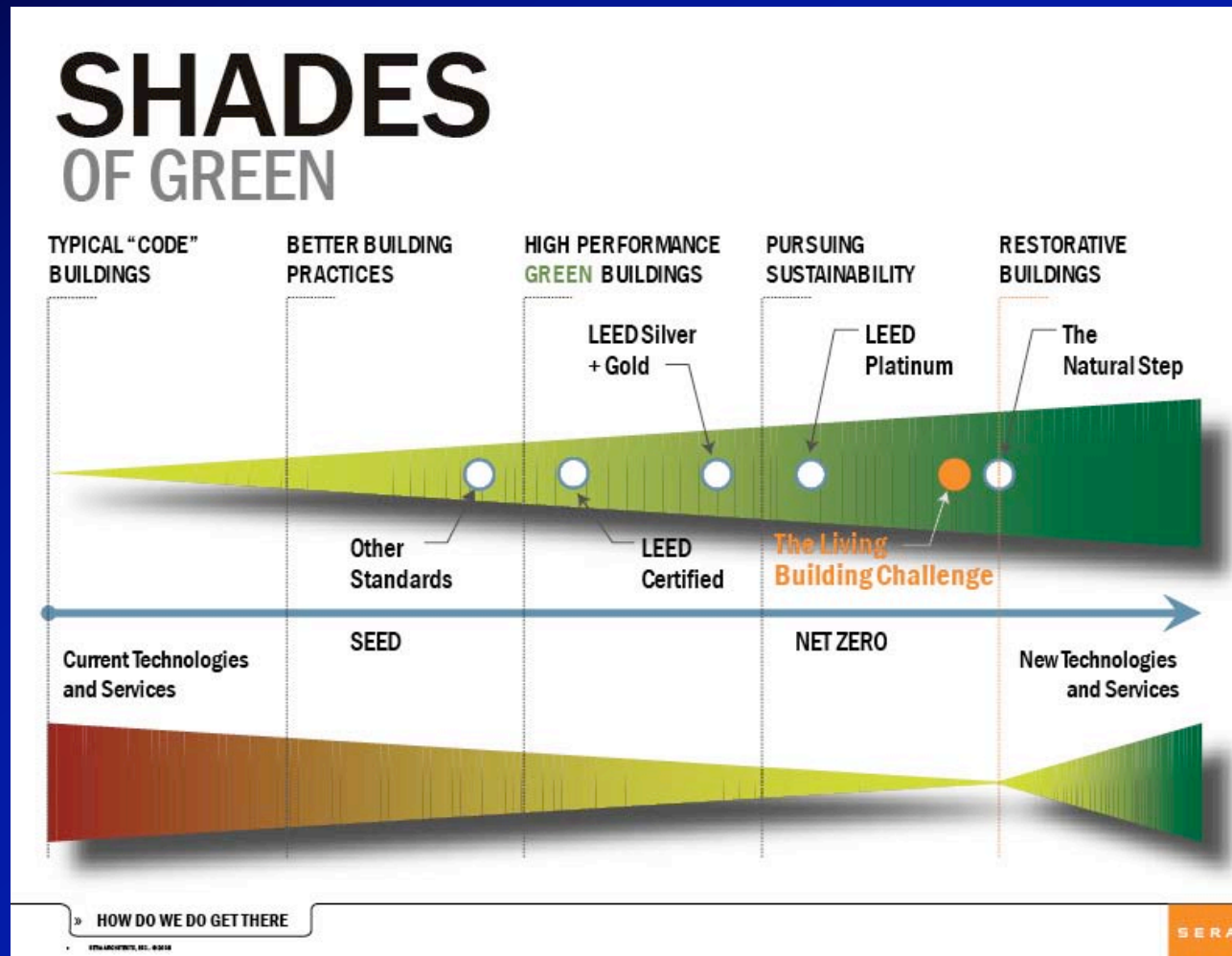
Source: SERA Architects, Portland, OR - 2008
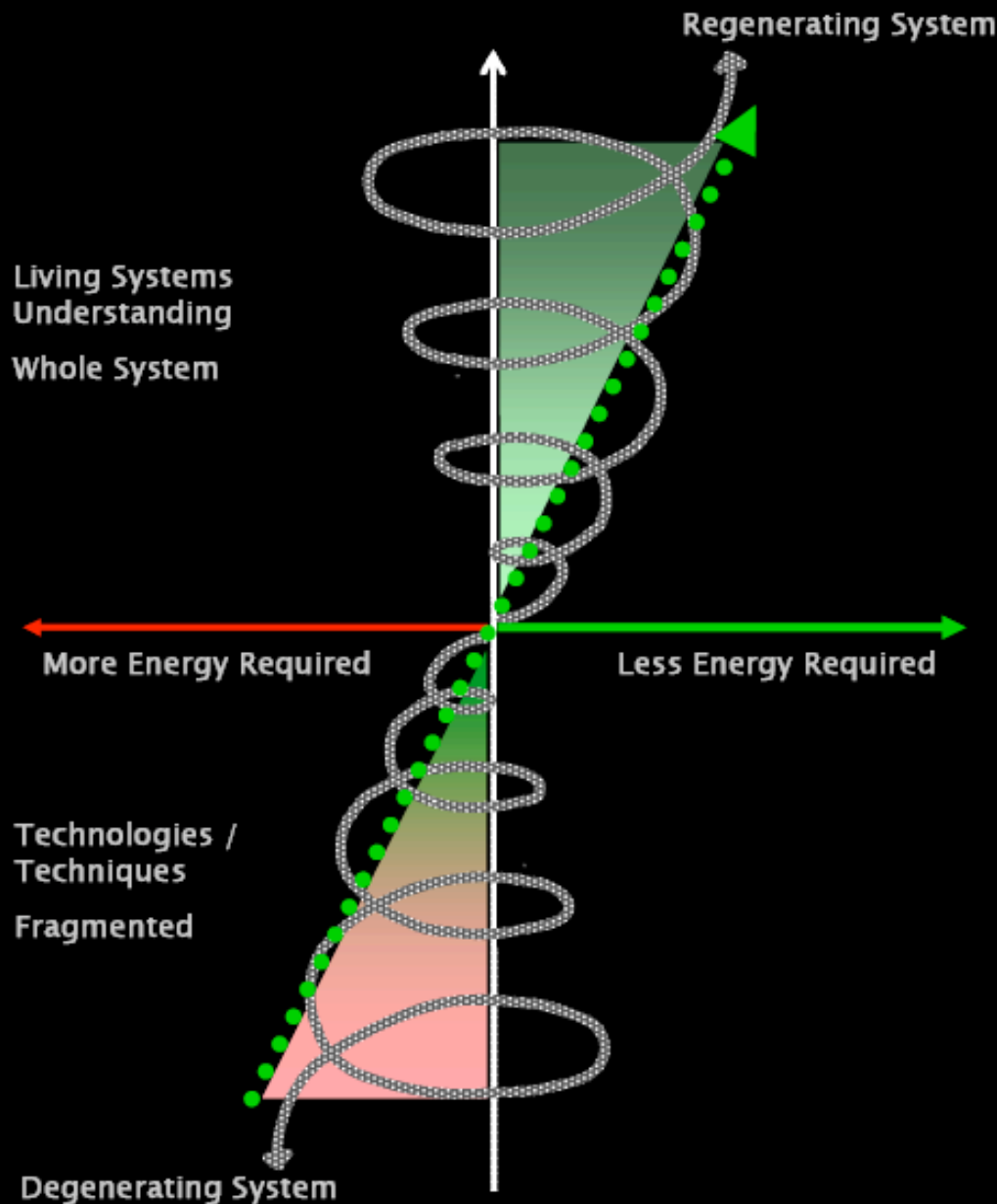
Trajectory of Environmentally Responsible Design

Why Not Look at How We Got Here?

www.biomimicry.net/
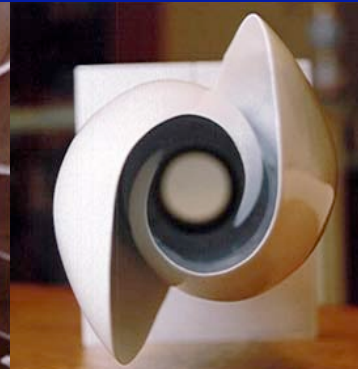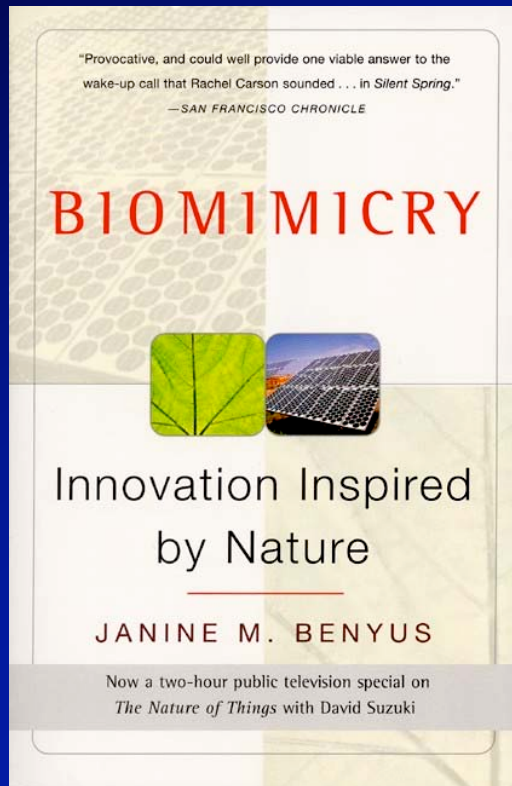
A Lot is Happening…

ICC-USGBC MOU May 2007

ICC
Green Building
Home Page

Building Safety JOURNAL
THE PROFESSIONAL JOURNAL OF CONSTRUCTION AND FIRE SAFETY   August 2007

- 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

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

Development Center for Appropriate Technology - 2008

A Lot is Happening…

This is Our Generation's Great Work

This is the Challenge of a Lifetime - the most important work of our careers.

Let's get on with it!

GREEN BUILDING

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

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Thank you!

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