

Toward a Tribal Building Code

Renewable Energy & Efficiency for Tribal Community Development Workshop

Forest County Potawatomi Bingo Casino

Milwaukee, Wisconsin

August 7-9, 2012

*Our greatest responsibility
is to be good ancestors.*

- Dr. Jonas Salk

David Eisenberg

Director

Development Center for Appropriate Technology

This is the presentation that I intended to give at this workshop but unfortunately was unable to because I did not have my computer with me. Instead I just went over some of the key issues without a Powerpoint presentation to accompany my remarks. This is also somewhat longer than what I would have had time to present. - David Eisenberg

A Bit of Background



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I want to give a little background about me and the Development Center for Appropriate Technology. As a recovering contractor I have a broad range of experience in all types of building, both conventional and alternative. DCAT is a non-profit organizations, founded almost 20 years ago. During the intervening years we have been involved in a great many things, most of them related to the built environment. I had a couple of years of architecture school, was directly involved in construction for more than fifteen years, had my own construction company for a few years, and have been involved with green building since the mid 1980s, including two terms on the Board of Directors of the US Green Building Council and almost a decade chairing the USGBC Code Committee. I was fortunate enough to learn about systems thinking and systems science from Donella Meadows, spent a few years mingling with the building science community and have been involved with natural building and appropriate technology for about 20 years.

What is "Appropriate Technology"?

Classic definition: the lowest or simplest level of technology that can do the job well. It can be high-tech, intermediate-tech, low-tech or no-tech, or a combination based on specific uses and needs.

Best definition: technology that doesn't make people or their communities dependent on systems over which they have no control - thus, technologies that enhance the local capacity to meet local needs.*

Appropriateness also relates to where technology is used & cultural, economic, & environmental *context*.

**my thanks to John FC Turner for this definition and understanding.*

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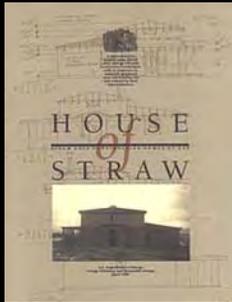
I want to take a minute to talk about appropriate technology. The name of my organization is the Development Center for Appropriate Technology so people ask what makes technology appropriate? A standard definition of appropriate technology is that it is the simplest or lowest level of technology that you can use to do well what needs to be done. I contrast that with our cultural bias that tells us that higher technology is always better, that there is an obligation to always use the highest level of available technology one can afford, and that when new technology is introduced the old technology becomes obsolete and is no longer useful. The reason we care about the level of technology is that higher levels of technology come with higher levels of unintended consequences and at some point the consequences are not merely unknown, they're unknowable, especially in the time frame in which we must make our choices. Appropriate technology isn't necessarily low tech. It is the right level of technology for what must be done, based on the specific use and real needs, circumstances, and to the degree that they are knowable, the consequences flowing from its use. It can be high-tech or no-tech or anything in between. My favorite definition of appropriate technology comes from John Turner, who I mentioned earlier: it's technology that doesn't make people or their communities dependent on systems over which they have no control. If we think about this seriously, it means technologies that enhance the local capacity to meet local needs - which is the true foundation for sustainability and for real security.

Building Sustainability into Codes since 1995



In 1995 DCAT developed our program, Building Sustainability into the Codes. We saw it as a three phase process: creating awareness of the need for change, capacity building to enable the changes to take place, and transfer of leadership to the code organizations and other groups, which we hoped would happen over time as a result of our work. Starting around 1998 we had built relationships with some of the code groups to the extent that they invited us to create feature issues in their magazines about alternative materials and designs, green building, and sustainability. We produced a lot of feature issues and wrote articles and I had a regular column in their magazines for a while. In 2007, as Chair of the US Green Building Council Code Committee I had the honor of signing a memorandum of understanding between USGBC and the International Code Council (ICC) - the U.S. national organization of building officials, to work together in support of green building and a more sustainable built environment. Later that year, ICC created their first green building feature issue without our involvement. And then in the fall of 2007 ICC gave DCAT their Affiliate of the Year Award and USGBC gave us a Leadership Award. Things were really starting to change.

Some of DCAT's Early Tribal Work



Navajo Nation Straw Bale & Earth Block Home



Workshops with the Pine Ridge and Rosebud Nations

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We have been involved in a number of tribal building projects over the years. The top row of images are from the 1993/94 project we did with the Navajo Nation, building a straw bale and compressed earth block house as part of a HUD-DOE-tribal collaboration. We were also involved in writing up the report that DOE published about the project - "House of Straw: Straw Bale Construction Comes of Age." The lower images are from a couple of projects also in the 1990s on the Pine Ridge and Rosebud Nations. Because these projects were not well supported once we were no longer involved, we learned that parachuting in either "experts" or technology without sufficient resources and follow-through on the ground tends to lead to failed demonstrations. Thus we stopped doing this type of work unless we were sure that the projects we were involved with could be completed well.

Current Tribal Work: Creating Tribal Codes...

DCAT has been helping facilitate creating *tribally-developed building codes*, and the capacity-building process and support structures necessary to create, evolve and maintain their long-term use.

We have been working with EPA, NREL, HUD, several tribes, and other agencies and organizations to bring this vision into reality.

This is the beginning of a longer process - of coming together, listening, learning, sharing, exploring and building relationships.

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DCAT has been working with support from EPA Region 9 to facilitate a process for tribally-developed codes or systems to enable tribes to be able to have the built environment that they desire and need. This is and needs to be a long-term effort and it's really just beginning.

The Process of Creating a Tribal Code

There are realities of history, resources, capacity, relationships, and culture that must be respected and acknowledged. There are two worlds—two worldviews—to be seen and bridged.

We have been providing technical assistance to a few tribes and helping coalesce a shared vision and path toward evolving a truly healthy built and natural environment for tribal communities.

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The EPA contract we were working under involved technical support to a few tribes as well as work developing a framework through which tribes can create a system that works for them. We have recognized that for tribes there are two worlds - two worldviews - that need to be acknowledged and bridged. This effort will result in an EPA website that will be a resource for tribes seeking to deal with building codes and standards.

The Process of Creating a Tribal Code

The current EPA website for the Tribal Green Code Workgroup is:

<http://www.epa.gov/region9/greenbuilding/tribal-workgroup.html>

And the EPA Region 9 contacts are:

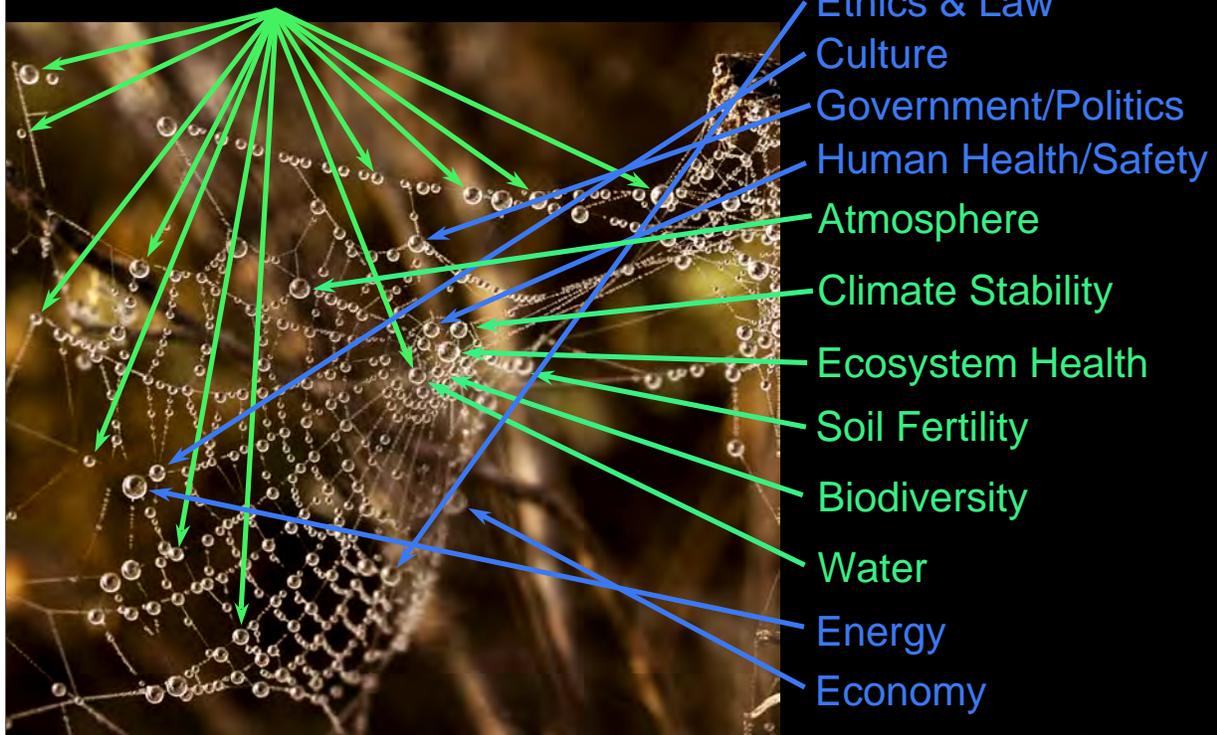
- Michelle Baker (baker.michelle@epa.gov)
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Maximum Health Minimum Harm in the Web of Life

The Natural World



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Ultimately what we need are systems that maximize health and real wealth - well being while minimizing harm to people and to the whole web of life including future generations. This requires paying attention to both human and natural systems.

The Riskiest Course is the One We're On Now...

Critical (and increasingly risky) Assumptions:

A stable and predictable climate.

Adequate and affordable supplies of energy, water, food and other critical resources.

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

Current regulatory systems are capable of dealing adequately with emerging risks.

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The regulatory realm deals with risk. But they don't deal with it in the way that we need to be dealing with it now. Clearly, if you're paying attention to what is happening on the planet, the riskiest thing we can do is to keep doing what we're doing now. The assumptions on which so many decisions and public policies are based are increasingly unrealistic. Continuing to rely on past assumptions is inherently risky in and of itself. Questionable assumptions include that we will have a stable and predictable climate, that we'll continue to have sufficient and affordable supplies of energy, water and other vital resources that we need, not just for building but for everything we do. We continue to act as though the natural systems on the planet, our life support systems, are robust enough to withstand whatever 7 or 8 billion human beings might choose to do. And in the building regulatory realm, we act as though the current systems we have in place to regulate what gets built are adequate to deal with these larger, emerging problems.

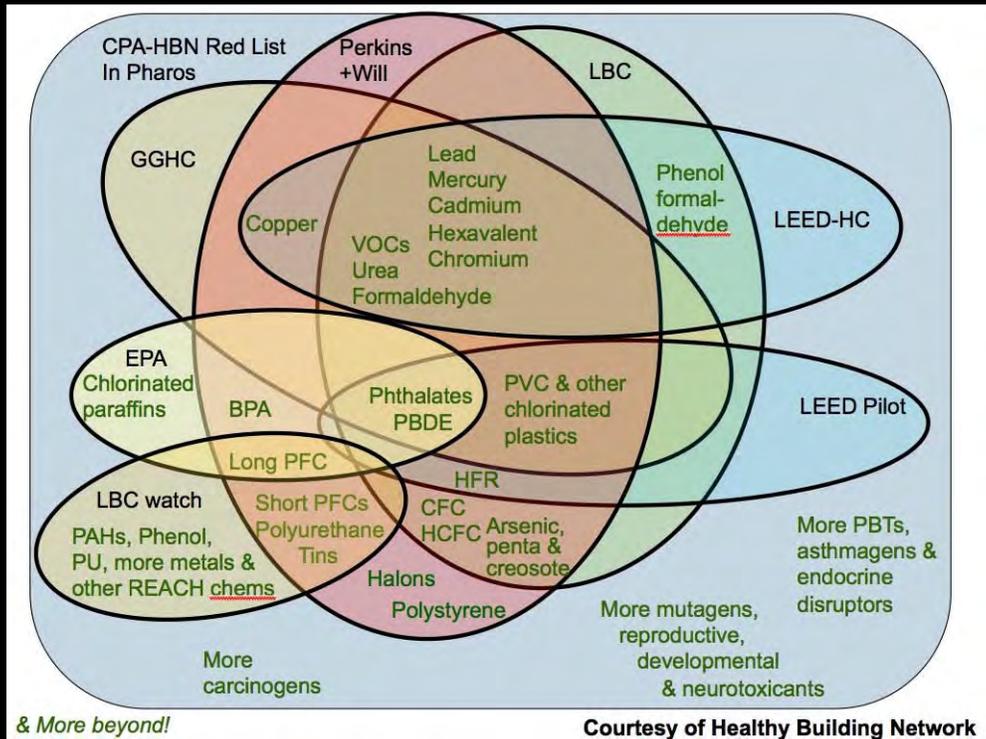
The Whole Lifecycle of Built Projects



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When we think about the entire lifecycle of a building we can more easily see that the impact of most building projects start with the acquisition of resources and their transportation and processing and extends to the impacts of the building on the land and the infrastructure it requires. We need to consider the impacts of the construction process, the wastes generated, toxic chemicals used, the flow of resources through the building over its lifetime for repair, maintenance and refurbishing and for the services we demand of our buildings. And then we'd need to think of the impacts at the end of the life of the building and out into the future, and whether the materials are reusable, recyclable, toxic, or will just end up in the landfill. Then we can be conscious of the upstream and downstream impacts of the whole project starting far from the site and before the project starts to wherever those impacts eventually occur, including long after it is gone.

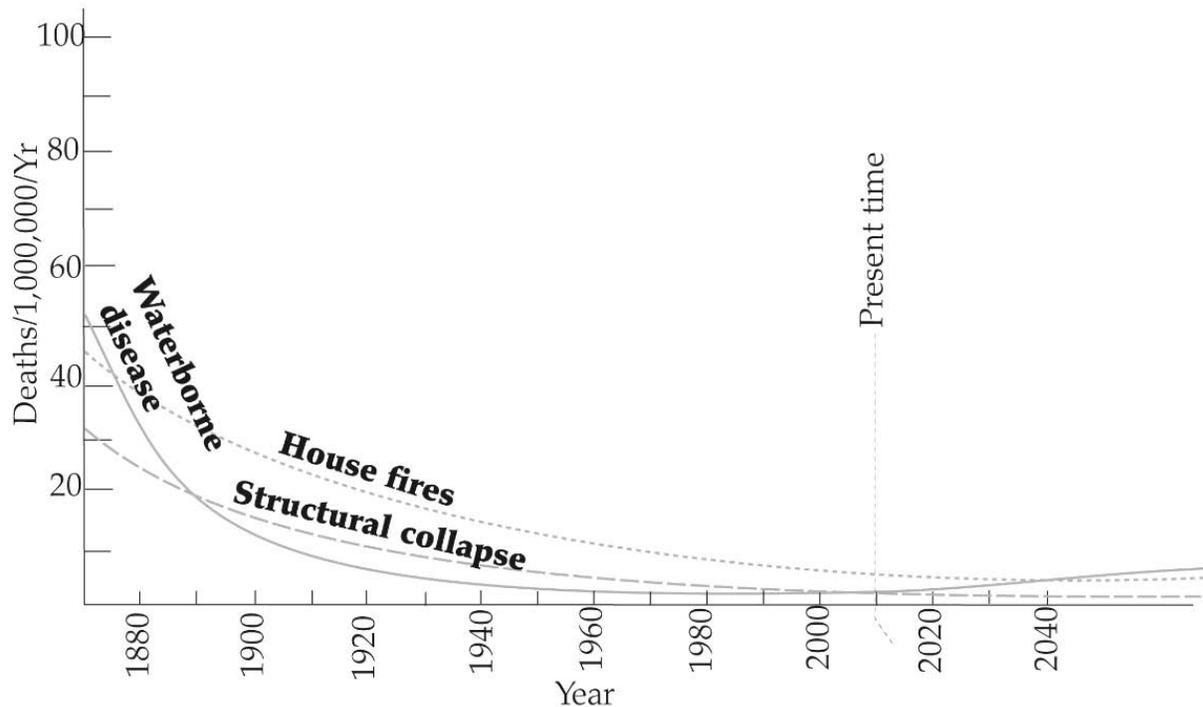
Building Materials/Chemicals Red Lists



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This graphic from the Healthy Building Network gives an overview of the various chemicals and materials in buildings and building products that have been identified as dangerous by various groups, organizations, agencies, rating systems, etc. These are real, serious hazards that have until very recently been almost entirely ignored by building regulations.

Changes in Hazards Attributable to the Built Environment

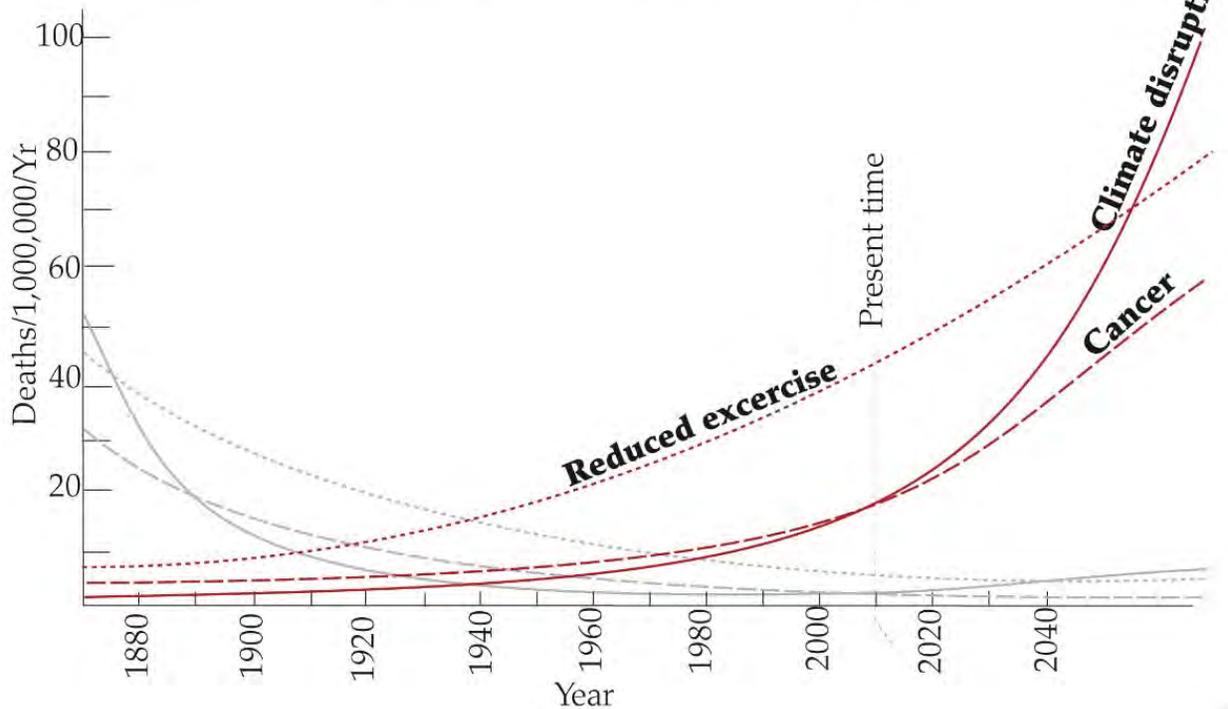


Credit: Art Ludwig, Oasis Design

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A colleague of ours, Art Ludwig from Oasis Design in Santa Barbara, California has pointed out that our codes and regulations largely focus on old risks - he calls them mostly 19th Century hazards like waterborne illness, structural integrity, fires. And, though we've dramatically reduced the incidence and threats from these hazards they maintain the highest place in our regulations and regulatory thinking.

Changes in Hazards Attributable to the Built Environment



Credit: Art Ludwig, Oasis Design

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Art points out that these older hazards are now dwarfed by emergent hazards that are accelerating rapidly and yet efforts to address these larger and growing risks in codes are resisted and lag behind the continued ratcheting up of requirements dealing with the old risks. The incidence of cancer and respiratory illness related to indoor air environmental quality and the toxicity of materials in buildings, though difficult to prove direct cause and effect, is without a doubt related. And the hazards that will accrue related to climate change will be larger still.

"Codes" or "Sustainable Design Support Systems"?

We've been struggling with the word "code" for describing what we're striving to create through this work, because this goes beyond codes and beyond the usual regulatory paradigm...

We're leaning toward this: Sustainable Design Support System - SDSS - though that doesn't quite embody it all either. So we're open to suggestions.

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I want to point out that we are looking for the right terminology for this effort - because what we are trying to create is bigger than codes and in many ways more than the regulatory realm for the built environment. So we are open to suggestions about what to call this. Feel free to suggest alternatives.

Tribal Green Code Summit

I want to share the overview presentation that I was honored to give near the beginning of the Tribal Green Code Summit in Denver in June 2011 and then part of another I presented to the tribal leadership at the Pinoleville Pomo Nation in Ukiah, California.

I offer these as a starting point for discussing and exploring the issues, needs, and possibilities as tribes work toward taking control of their own built environment.

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What I want to do now is share slides from two recent presentations - one from the Tribal Green Code Summit held in Denver in June 2011 and the others from a presentation to the tribal leadership at the Pinoleville Pomo Nation in Ukiah, California. This will give a good overview of the work we've been doing and the thinking behind it.



*A Path Toward Wholeness:
Supporting the Process of
Creating Tribally-Developed
Building Codes*

Tribal Building Code Summit

June 23 & 24, 2011

EPA Region 8 Headquarters

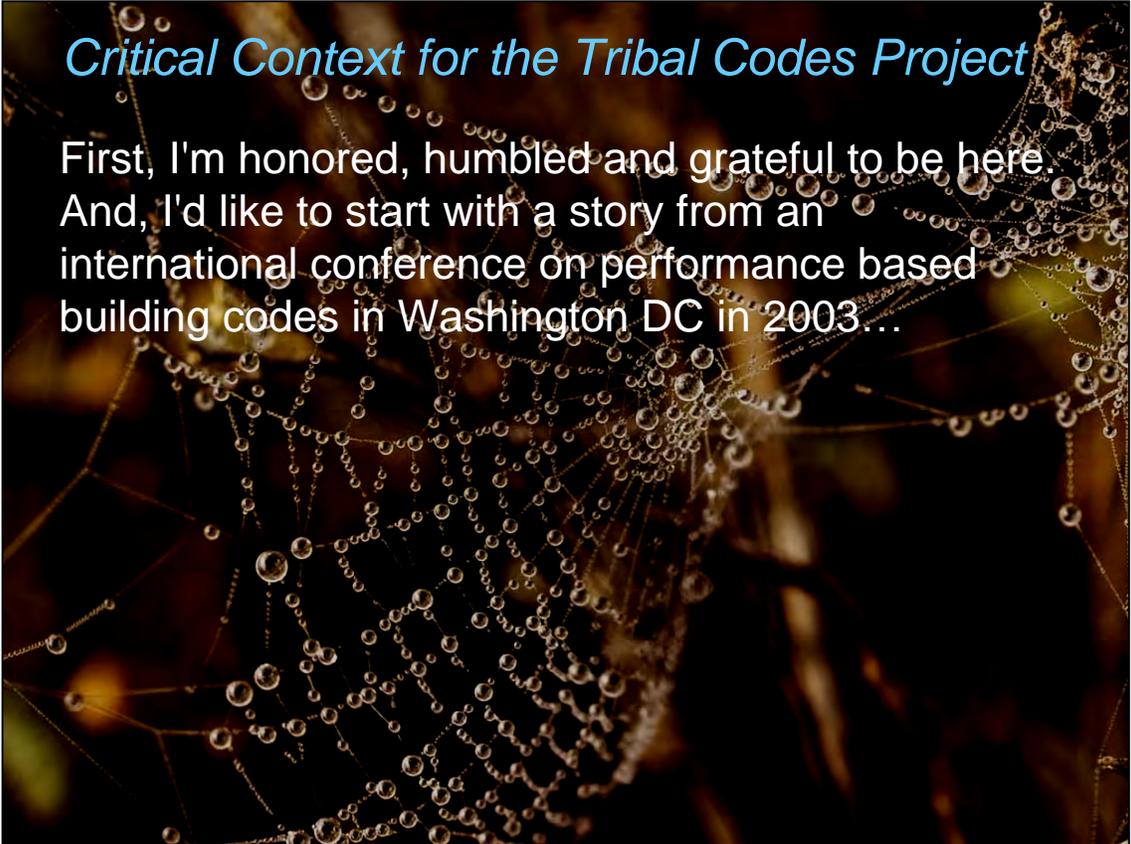
Denver, Colorado

*David Eisenberg
Executive Director*

Development Center for Appropriate Technology

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This is the presentation I gave near the start of the Tribal Green Building Code Summit.



Critical Context for the Tribal Codes Project

First, I'm honored, humbled and grateful to be here.
And, I'd like to start with a story from an
international conference on performance based
building codes in Washington DC in 2003...

I started my overview talk in Denver by saying that I am humbled and honored to be given an opportunity to help frame the work we are embarking upon here. I began with a story from my 2003 presentation in Washington DC at an international conference on performance-based building codes. I began that talk by asking the audience to look around the room at who was present at the conference. I then said that what I was really interested in was who was not present. I said I was thinking of two particular groups of people whose interests were virtually never represented in such meetings and regulatory processes. The two groups I had in mind were more than half of the population of the planet who were surviving on less than two dollars a day - for whom our building codes are not irrelevant but in fact create a threshold that is so high that they are relegated to illegal substandard housing because they could never afford to build to the minimum requirements established by our codes. And the other group of people were the billions of people who will be born in the coming decades, who have no voice or representation in these processes. Not to mention all the other species who have no representation in any of this. I asked if they thought that that was alright?

My grandson Joe & granddaughter Juliette

How I ask that question now:

Where in our current regulatory systems or decision-making processes is there continuous and explicit representation for the safety, welfare and rights of our children's children?

Our greatest responsibility is to be good ancestors.

- Dr. Jonas Salk



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This is my current version of that question - That's my grandson Joe, 12, and our granddaughter Juliette, now about seven months old. And this is how I ask that same question today on their behalf: Where in our regulatory systems do we require explicit and continuous representation of the rights, safety and welfare of future generations? It isn't there and I can't think of a much bigger gap in our thinking than that. I think this quote - that our greatest responsibility is to be good ancestors - says it all. And I don't think we're doing very well in this regard.

Critical Context for the Tribal Codes Project

- A different starting place - Reverence (not fear) for all life and all relationships.
- This is a tribally-driven and tribally-owned process.
- All of the existing building codes and standards, organizational structures and organizations, regulations, and policies are key resources for this process, but they ARE NOT the universe...



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The mainstream regulatory system we have now, the codes and standards and all the rest are the result of reactions to failures and disasters of various sorts and they are attempts to keep bad things from happening again. They tend to be fear-based and restrictive. And while what they are striving to do is very important, it isn't sufficient. They typically grow out of a reductionist world view that sees the world as a collection of objects, and therefore tends to be fragmented. On the other hand, indigenous cultures around the world, including most tribal cultures are based on seeing the world in terms of relationships - between humans and the natural world, within the natural world, and between humans and human communities. It is also a worldview grounded in respect and reverence for those relationships. While there are elements of reverence in these other systems, it is not foundational like it is in tribal cultures. If we started with reverence for all relationships in creating a regulatory system or codes, we would end up with something quite different from what we have now.

It is also important for all of us to remember that what we're doing here is in support of tribes - a tribally-driven and owned process. And it is worthwhile, I think, for us to think of all the existing codes and standards and organizations and policies, etc, as important resources to this process, but to fully recognize that that does not represent the universe of possibility in this realm.

Critical Context for the Tribal Codes Project

- And, similarly, a reminder for those of us supporting this process — the federal agencies, nonprofit organizations and others...

- we and whatever we bring to the process are also just resources in support of tribes developing what they want and need. We are not in charge of the process or in setting the values and goals.



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Similarly, it's important for all of us who are supporting this emerging process, whether nonprofit organizations, federal agencies or others, to remember that we too are resources, and that we are bringing our knowledge and various other resources to this process in support of the tribes developing what they want and need. And to remind ourselves that we aren't the ones in control of the process or in setting the values and goals for this process.

A Potential Evolution of Codes...

Protecting Human Health and Safety

(Traditional Building Codes),

while also Protecting the Natural Environment

(Green Building Codes),

while also Respecting, Protecting (and Expressing)

Cultural Values

(Tribal Building Codes)...

And, we need to remember that codes only do some things well. There are other things that they can't do - so the universe is bigger still...

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It may be valuable, as we look at codes, to think about what has been happening as a kind of evolution, with traditional codes focusing on protecting human health and safety, as well as property, primarily from physical threats related to the built environment. The advent of green codes has added to that set of responsibilities protection of the natural environment as well as some things like indoor environmental quality and resource conservation. Taking this to the next step, tribal codes would also recognize, respect, reflect and protect cultural values.

It is also important to remember the limitations of codes - they can only do certain things well and there are other things that they can't do at all. So the universe of possibility and potential systems that might emerge from this process is bigger still...

Critical Context for the Tribal Codes Project

Some of us may have a vision of where this process should lead, or of what kind of codes and standards, or regulatory systems, or educational processes might be needed or desirable to "solve the problems" related to tribal housing and building.



We can offer our ideas but it is the tribes that must create their own vision, and it may take many years to build the capacity to achieve what is needed and desired. And that's okay.

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It is not hard for some of us to visualize what we think this process should produce, where it should lead, what kind of codes and standards or regulatory systems are needed or wanted or would be able to "solve the housing problems" for tribes. We can and should be willing to offer our ideas and suggestions, but it's the tribes that need to create their own vision, as diverse as it may turn out to be. The reality is that it may take many years for that vision to be fully developed and carried out, and that's really okay. We need to see this process in a long perspective.

Critical Context for the Tribal Codes Project



Caminante no hay
camino se hace
camino al andar.

The road is not
made - we make it
as we walk along.

-Antonio Machado

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The Spanish poet wrote this and it seems appropriate for what we're doing here. It is unprecedented and as this says, the road is not made, we make it as we walk along. And that is what we are doing.

Critical Context for the Tribal Codes Project

I'll offer a glimpse into what I've come to see in the 16 years I've been working on sustainability and codes, standards, green building programs & rating systems.



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I want to offer a very brief glimpse into how I have come to view some aspects of building codes and the building regulatory system in relation to sustainability. A lot is changing and in the past few years there has been a proliferation in the U.S., as in other countries, of green building programs, rating systems, standards, and codes. There are other systems and processes and organizations emerging like the Natural Step Framework, Lifecycle Analysis and Assessment databases and systems, that extend beyond building and codes yet have a connection and relevance to our effort.

Minimum Requirements...

International Building Code (USA) - 2006 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 and to provide **safety to fire fighters and emergency responders during emergency operations**.

Blue = explicitly defined

Yellow = implicit/undefined or partially defined

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Let's start with the fact that codes are minimum requirements, defining the least you have to do to comply with the law. But they are also a mixture of very explicitly defined requirements, such as the things you see in blue — like structural strength, fire safety, means of egress — the things that are spelled out in the codes. There are things that are only partially defined in building codes, such as public health, which includes much more than what is covered in building codes. And there are other things that are implicit, like general welfare and life and other hazards attributed to the built environment that are undefined. Some believe that codes should only deal with life-safety issues and nothing more. But even that is much more complex than people imagine.

Codes Do Well with the Risks they Address



Though this hasn't always been evident in tribal housing... modern building codes enable us to design and build structures that are relatively safe for their occupants, making it seem that we've eliminated or greatly reduced the risks associated with buildings...

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In reality, though clearly not always apparent in tribal housing, our modern building codes are extraordinarily good at enabling us to design and build buildings that rarely burn down, fall down, trap people in emergencies, expose them to raw sewage, electrocute them, let them fall from high places, or, as I often say, suffocate them too quickly. Because they are effective at managing these types of risks, many people think we've eliminated or greatly reduced the risks associated with buildings.

But What About Systemic and Future Risks?

In reality, what we've actually done is to just *move* many forms of risk in space and time:

- away from the building site, out into the natural systems that support us, and
- into the future.



In reality, we've created a very fragmented building regulatory system that doesn't consider systemic risk, cumulative harm, hazards created away from the building site, or risks to future generations. As a result, what we're actually doing is just moving many types of risks in space and time. We're moving them away from the building site out into all the natural systems on the planet - our life support systems - and from the present to our children and grandchildren and all the future generations of all the other species on whose welfare our welfare also depends.

Many Huge Hazards Are Hidden in Plain View



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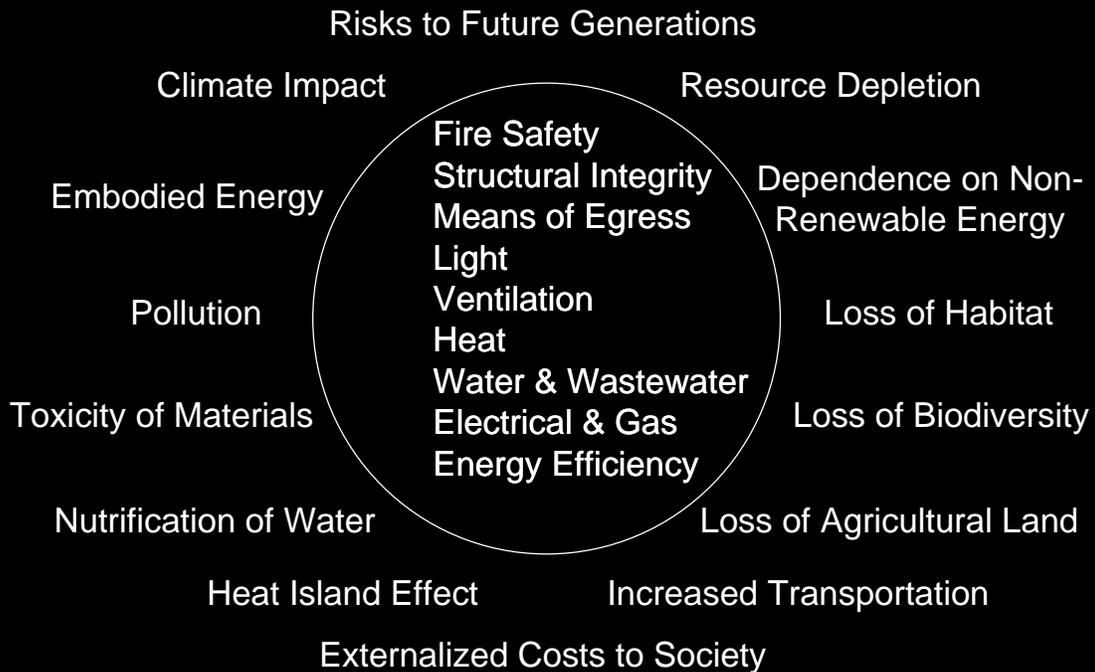
Looking at buildings through codes is a lot like looking through a microscope. We can see important hazards to people in and around buildings. But important as they are, these building-scale or project-scale risks completely fill our field of view. They're important because they're risks to real people. But outside the field of view are other real risks being created that are many orders of magnitude greater - generalized, cumulative, aggregated and distributed risks - to billions of people - that can't be seen through that lens.

Risk - Through the Microscope of Codes...

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These are the categories of risk and responsibility laid out in the codes. This is the view through that microscope...

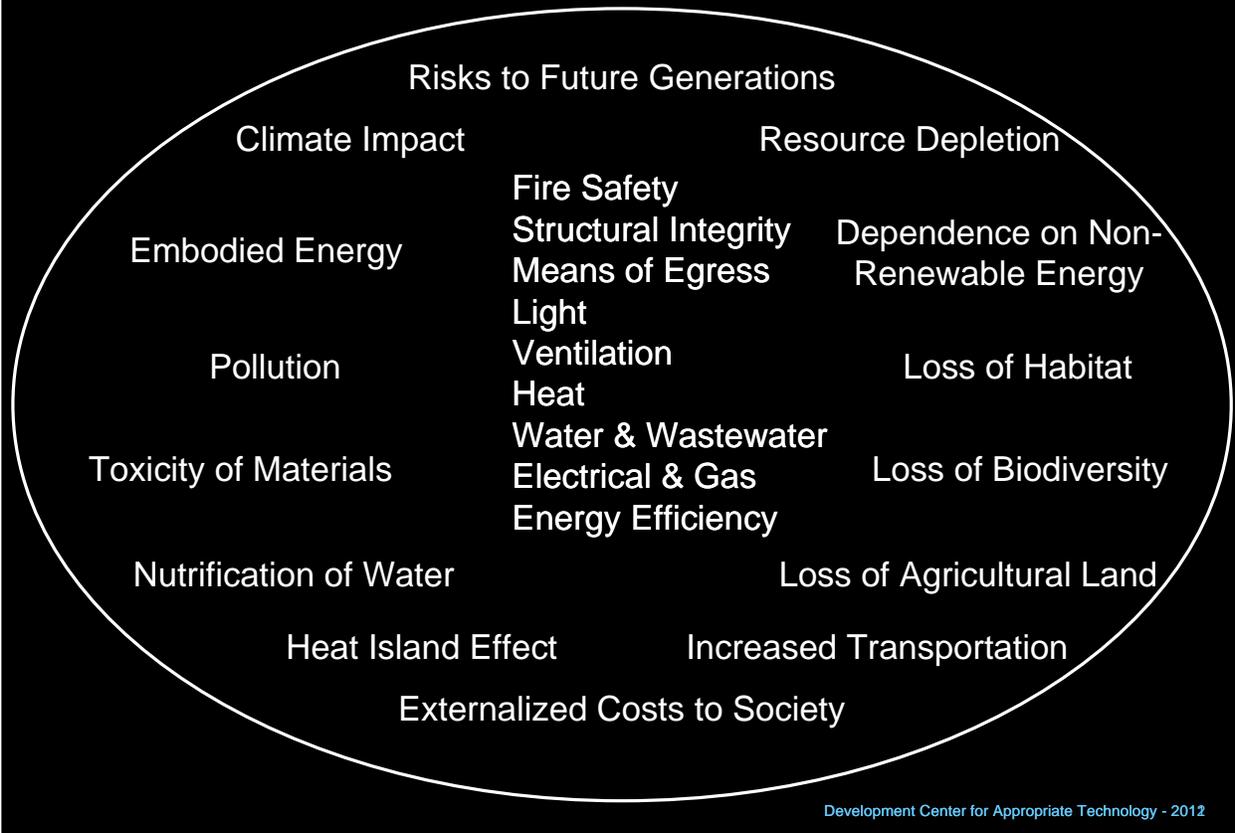
Risk - The Bigger Picture...



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Here are some of the larger risks which are also attributable to the built environment and therefore part of the responsibility for safeguarding the public. However, most of these types of hazard are not currently addressed in building codes, and many not addressed in any current regulatory system.

It Isn't Either/Or...It's About Balance...



It isn't either-or... we have to learn to address all these risks at the same time. What is needed is a more complete and balanced regulatory response to address and balance all these risks together.

What If...

What if entering the building regulatory realm wasn't just an elaborately detailed map of the line separating what's illegal from what's barely acceptable?...

What if it enabled us, instead to see the full range of possibilities, whether high or low-tech?

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Because codes, like almost all regulations, are minimum standards, what one finds in codes is essentially a very detailed description of the boundary between what is illegal and what is barely acceptable. What if when you entered this realm, what you also found was a wealth of information about what was possible, not just very lowest set of requirements, but the full range of possibilities including goals for what is desired, not merely prohibitions against what is to be prevented?

What If...

What if there was clear recognition that non-industrial does not mean primitive?



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I also think it's worthwhile to mention that our codes are nearly exclusively designed around industrialized building. There is a very strong resistance to the idea that non-industrial or pre-industrial building materials or systems could be acceptable. In fact there is a widespread belief that non-industrial means primitive. What you see in these pictures defies that thinking. The two photos in the upper left are of Berne Switzerland. You're looking at buildings that have been in continuous use for 800 years. The two righthand images next to the books are of the cathedral at York in England, which I visited a year and a half ago. This is one of the most magnificent buildings I have ever been in and it is also 800 years old, predating the industrial revolution by many centuries. We have much to learn from the past including from traditional ways of building developed in indigenous cultures over thousands of years.

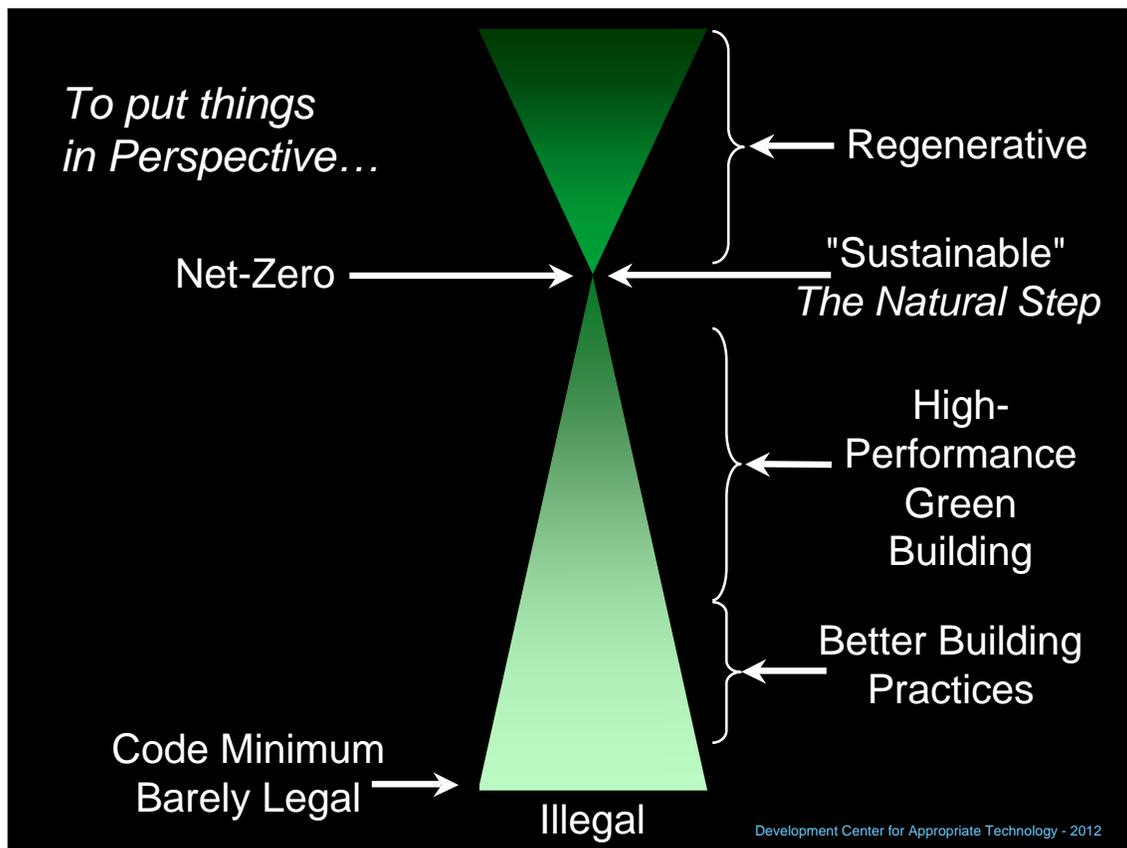
Again, there are Emerging Resources...

To put some of this into perspective, we can look at how some of these resources relate to each other and to the larger universe of possibility.

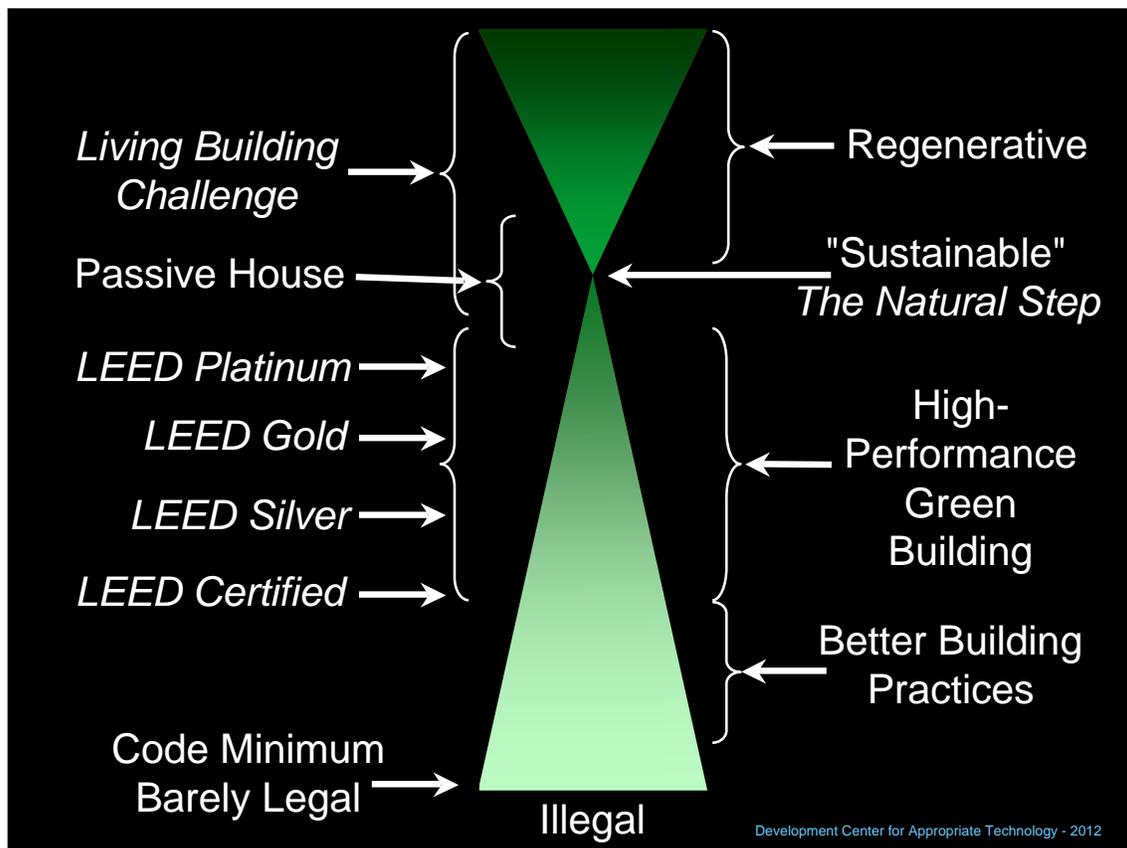


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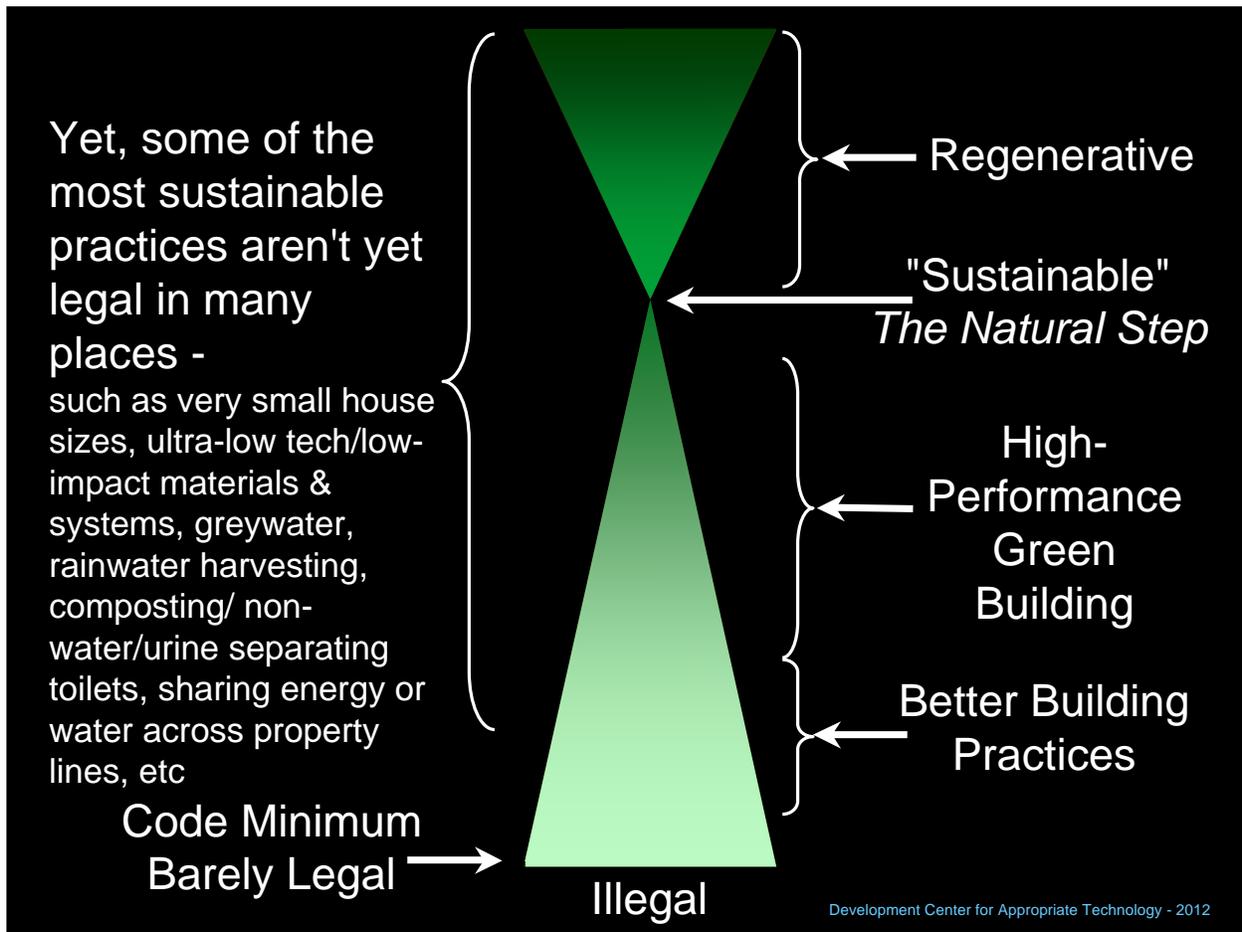
There has been a great proliferation of green building programs, rating systems, standards and now green codes. I want to help put all this into perspective and relate it to the larger universe of possibility that might help inform our process here.



This graphic may help put some of this into perspective. We can think about the level of sustainability or greenness as a range extending from not meeting the minimum requirements established by codes and thus being illegal (since codes are minimum standards, if anything is done to a lower standard it's a violation of the law) to better and higher performance/green buildings, to a place of net-zero or "sustainable." What Bill McDonough says is 100 percent less bad and Paul Hawken has defined as the midpoint between destruction and restoration. The goal is to get to a place where we're creating regenerative projects and systems - the way nature and natural systems work - creating more benefit than harm across the range of impacts over the life of a project.



Here we can see where the various levels of LEED (or it could be other green building rating systems) might fit into this framework as well as the Passive House. System. And we can also see the Living Building Challenge, which I will discuss a bit more in a few moments. We can argue about whether this accurately positions these things, but it gives a sense of the relationships. (In response to a comment at the workshop I have shifted the level of Passive House downward in this slide - DE)



It is worth noting that many of the most sustainable practices are not yet approved or allowed in many places - in other words, some of the lowest impact, most viable and beneficial building materials, systems and practices are, in essence, illegal. That is an area needing investment for research, development and deployment.

The Living Building Challenge



LIVING
BUILDING
CHALLENGE™
2.0

A Visionary Path to a Restorative Future



November 2009

www.ilbi.org

Development Center for Appropriate Technology - 2010

I'll just touch briefly on the Living Building Challenge, which is a voluntary certification program aimed at creating projects that are restorative or regenerative - projects that create more benefit than harm across the spectrum of impacts over the life of the project.

For the Good of All for the Long Haul

The focus of the LBC is on creating built projects that *belong* where they are and work for the good of all for the long haul. It grows out of respect for all living systems and the need to address unintended consequences.



PETALS

SITE	Limits to Growth Urban Agriculture Habitat Exchange Car Free Living
WATER	Net Zero Water Ecological Water Flow
ENERGY	Net Zero Energy
HEALTH	Civilized Environment Healthy Air Biophilia
MATERIALS	Red List Embodied Carbon Footprint Responsible Industry Appropriate Sourcing Conservation + Reuse
EQUITY	Human Scale + Humane Places Democracy + Social Justice Rights to Nature
BEAUTY	Beauty + Spirit Inspiration + Education

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The Living Building Challenge is actually a pretty good start at creating a process to create a built environment that belongs where it is built, and that works for the good of all for the long haul. It is one of the much needed transitional tools

The Living Building Challenge

The LBC aims to inspire the shift toward truly regenerative projects. To be certified, projects must meet 20 Imperatives and have been in operation for a year. They must:

- harvest all of their own energy & water
- offset their land use & carbon impacts
- be adapted to their site & climate
- be free of toxics & operate pollution free
- provide healthy, humane indoor environments
- be beautiful, inspirational & educational

PETALS

SITE

- Limits to Growth
- Urban Agriculture
- Habitat Exchange
- Car Free Living

WATER

- Net Zero Water
- Ecological Water Flow

ENERGY

- Net Zero Energy

HEALTH

- Civilized Environment
- Healthy Air
- Biophilia

MATERIALS

- Red List
- Embodied Carbon Footprint
- Responsible Industry
- Appropriate Sourcing
- Conservation + Reuse

EQUITY

- Human Scale + Humane Places
- Democracy + Social Justice
- Rights to Nature

BEAUTY

- Beauty + Spirit
- Inspiration + Education

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The Living Building Challenge 2.0 includes site, energy, water, materials, and also beauty and inspiration and education. These are there because many of us believe that people don't take care of things they don't care about - they don't care for what they don't love - and people love beautiful buildings and so they last longer - which is much more sustainable.

Land-Use Issues are Big in the LBC

The LBC starts with a focus on building where and what is appropriate to build.



PETALS

SITE

- Limits to Growth
- Urban Agriculture
- Habitat Exchange
- Car Free Living

WATER

- Net Zero Water
- Ecological Water Flow

ENERGY

- Net Zero Energy

HEALTH

- Civilized Environment
- Healthy Air
- Biophilia

MATERIALS

- Red List
- Embodied Carbon Footprint
- Responsible Industry
- Appropriate Sourcing
- Conservation + Reuse

EQUITY

- Human Scale + Humane Places
- Democracy + Social Justice
- Rights to Nature

BEAUTY

- Beauty + Spirit
- Inspiration + Education

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Place is crucial and this is where the LBC starts - only building where it is appropriate to build and only building what is appropriate to build there.

The Living Building Challenge

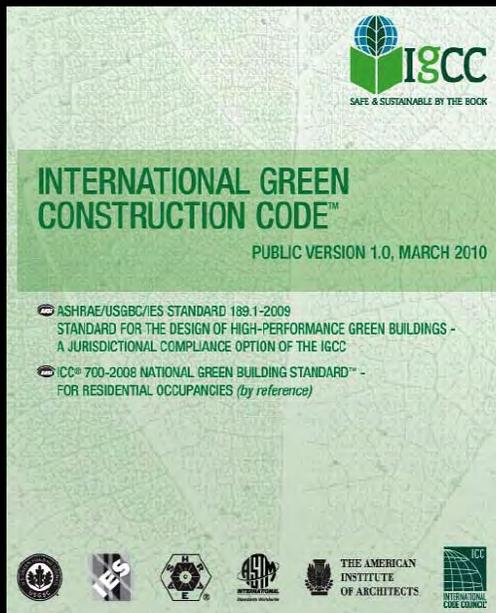
More info at:
<http://ilbi.org>



Development Center for Appropriate Technology - 2012

There are a number of Living Building projects that have been certified now and many more in the pipeline. It takes time because the projects must have been in full operation for a year before they can be certified. For more information visit the Living Future Institute at ilbi.org

The 2012 IGCC...coming soon...



The IGCC is a step forward. It contains both jurisdictional and project electives—flexibility and above baseline code choices. It can be a useful transitional tool.

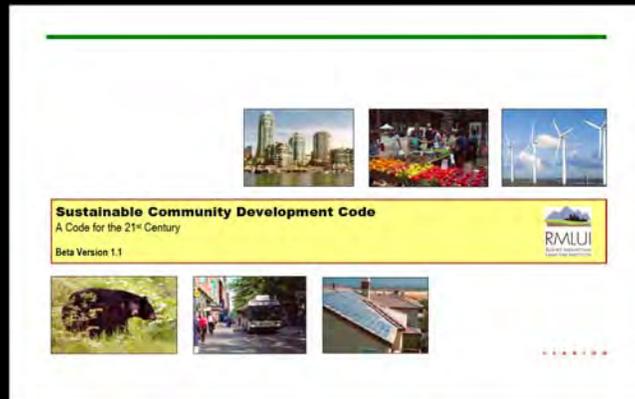
The Kayenta Township on the Navajo Nation has adopted the draft version as their code.

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I was on the committee that drafted the first version of this new code, the International Green Construction Code - the IGCC - which is in the last stages of development right now. It will be part of the set of 2012 I-Codes and is just for commercial buildings, not residential construction at this point. It has a great deal of flexibility built into it and that flexibility for both jurisdictions and for projects will be beneficial for getting some new practices, materials, designs and systems into use. As you will hear later, the Kayenta Township on the Navajo Nation is the first tribe to adopt this code.

For Land Use Codes RMLUI's SCDC

The Rocky Mountain Land Use Institute's (RMLUI) Sustainable Community Development Code is an excellent resource—a template for community flexibility in sustainability goals & policies.



<http://www.law.du.edu/index.php/rmlui>

Development Center for Appropriate Technology - 2012

There are some excellent resources for land use codes as well. Many of us know about Smart Growth and similar efforts to address land use issues more responsibly and sustainably. The Rocky Mountain Land Use Institute at the University of Denver, has produced a draft Sustainable Community Development Code (SCDC), that puts this all together in a powerful and useful way. This is really a framework for land use codes that incorporates and integrates many crucial sustainability requirements into workable codes. There is a huge amount of information and resources embedded in this document, but it is also the structure of the framework that is useful.

Sustainable Community Development Code

Table of Contents

The topics covered in the Sustainable Community Development Code are listed below. Chapters currently available are highlighted in blue. New chapters will be available soon. Other topics are under consideration. Background research monologues have been prepared for many of these topics and are available online at www.law.du.edu/mlui. Work is continuing on individual sections.

1. ENVIRONMENTAL HEALTH AND NATURAL RESOURCES

- 1.1. Climate Change
- 1.2. Low Impact Development and Green Infrastructure
- 1.3. Natural Resource Conservation/Sensitive Lands Protection (forthcoming)
- 1.4. Water Conservation
- 1.5. Solid waste and recycling (forthcoming)

2. NATURAL HAZARDS

- 2.1. Floodplain Management (forthcoming)
- 2.2. Wildfires in the Wildland-Urban Interface
- 2.3. Coastal Hazards
- 2.4. Steep Slopes (forthcoming)

3. LAND USE AND COMMUNITY CHARACTER

- 3.1. Character and Aesthetics (forthcoming)
- 3.2. Urban Form and Density (forthcoming)
- 3.3. Historic Preservation (forthcoming)

4. MOBILITY & TRANSPORTATION

- 4.1. Transit Oriented Development
- 4.2. Mobility Systems

- 4.2.1. Complete Streets
- 4.2.2. Bicycle Mobility Systems
- 4.2.3. Pedestrian Mobility Systems
- 4.2.4. Public Transit
- 4.3. Parking

5. COMMUNITY

- 5.1. Community Development (forthcoming)
- 5.2. Public Participation and Community Benefits

6. HEALTHY NEIGHBORHOODS, HOUSING, FOOD SECURITY

- 6.1. Community Health and Safety
- 6.2. Affordable Housing
- 6.3. Housing Diversity and Accessibility
- 6.4. Food Production and Security

7. ENERGY

- 7.1. Renewable Energy: Wind (small- and large-scale)
- 7.2. Renewable Energy: Solar (including solar access)
- 7.3. Energy Efficiency and Conservation (forthcoming)

8. LIVABILITY

- 8.1. Noise (forthcoming)
- 8.2. Lighting (forthcoming)
- 8.3. Visual Elements

The SCDC covers a wide range of issues starting with climate change, resource conservation, low-impact development and more, and includes wildfires, coastal hazards, and a great deal on streets and transportation including transit oriented development, complete streets, bicycle and pedestrian mobility systems, public transit and parking. Though it focuses on urban and suburban land use mainly, it also has relevance to rural communities and can be adapted as needed. It also includes a section on public participation and goes on to health, affordable housing, housing diversity and accessibility and food production and security. And it has extensive information about renewable energy - both wind and solar.

Sustainable Community Development Code

Site Design Strategies for Solar Access

INTRODUCTION

A great deal of attention has been placed on the role of sustainable building design and construction techniques in recent years. Many communities have adopted standards that encourage or require compliance with programs such as The Leadership in Energy and Environmental Design (LEED) Green Building Rating System™. The LEED system has become the nationally accepted benchmark for the design, construction, and operation of high performance green buildings. The program encourages the use of products and techniques to promote sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality.¹

Much less emphasis, however, has been placed on the role of site planning in a sustainable design program—and more specifically, on site design for solar access. The incorporation of both active and passive solar techniques are highlighted in any discussion of green building design, yet in order for either approach to be viable, they must have unobstructed solar access for a certain period of each day. Without careful consideration during the planning stages of a new neighborhood, future opportunities for the installation of active or passive features can be dramatically reduced or even eliminated altogether.

In order to ensure that the concept of sustainability encompasses the entire development site, not just what falls within the building envelope, additional steps must be taken. A pilot program currently being developed by the U.S. Green Building Council (USGBC) entitled LEED for Neighborhood Development or LEED ND², represents an important step towards broader consideration for solar access. For now, however, the application of these provisions is limited primarily to the individual developers who choose to use them. Zoning regulations play a significant role in the implementation of solar energy technologies at the local level, defining where, how, and when they may be used. Many communities have recognized the importance of addressing solar access within their zoning regulations and have taken steps to define the degree to which solar will be allowed, encouraged, or even required.

IMPLICATIONS OF NOT ADDRESSING THE ISSUE

The implications of not establishing provisions for solar access at the local level can be significant. At the most basic level, the opportunity for a community to reduce its energy consumption is diminished substantially. Without provisions in place to ensure solar technologies are allowed and that access to them is protected, they become more difficult and more costly to implement—and thereby may be passed over by all but the most "green" developers and homeowners. Choosing not to establish solar access provisions may also be costly to local governments as staff time needed to process variances and other requests increase.

On the other hand, establishing solar access provisions can be beneficial at a variety of levels. At a site planning level, organizing new development to achieve proper solar orientation can improve the energy efficiency of buildings on the site at little or no additional cost. When combined with other sustainable building techniques, the benefits of requiring and/or protecting solar access can be dramatic. For example, placing a building's long face on an east-west axis with a large percentage of its windows on the south side can reduce fuel consumption by up to 25%.³ In its Solar Access Design Manual, the City of San Jose, California states that it found that proper solar orientation of new homes built in the San Jose area produced total energy savings of 11 to 16.5 percent—with up to 40 percent savings from space cooling.⁴ In addition to promoting a measurable reduction in energy usage, solar access provisions can also help

¹ U.S. Green Building Council, LEED Rating Systems. [Available online](#). Last accessed online 10/30/08.

² U.S. Green Building Council, LEED Rating Systems. [Available online](#). Last accessed online 10/30/08.

³ *Passive Heating Renewable Energy in Work in Buildings*. [Available online](#). Last accessed online 10/30/08.

⁴ City of San Jose, California. *Solar Access Design Manual*.



ensure that the conversion of homes from traditional energy sources to solar energy over time can be accomplished relatively easily. Homes that are pre-designed to accommodate solar devices, not only from a site planning standpoint, but from a plumbing, wiring and structural standpoint as well can make future installations much easier and less costly.

GOALS FOR SOLAR ACCESS

While numerous examples of local governments adopting regulations to protect solar access opportunities are cited in this chapter, there is much yet to be done. This section outlines specific strategies and actions to be taken by communities wishing to take their policies to the next level. A range of examples are provided to help illustrate how strategies can be adapted to a range of situations depending upon the level of policy commitment, available staff resources, and political environment.

The primary goals of this chapter are to:

- Remove regulatory obstacles and streamline processes for the installation of solar technologies
- Implement protective regulations to ensure that property owner investments in solar technologies are protected
- Preserve the opportunity for increased use of solar technologies in the future;
- Provide incentives for the use of solar technologies in new construction and in the renovation of existing homes; and
- Promote an overall reduction in energy usage



Photos: Left and right: "Using the LEED 3 Building Developer Solar Checklist" by Peter Hildbrandt. [Available online](#). Last accessed online 10/29/08. Center: U.S.D. Practices Center, High-Performance Home Technologies: Solar Thermal and Photovoltaic Systems. [Available online](#). Last accessed online 10/30/08.

Each section starts with an introduction, implications of not addressing the issue and goals.

Sustainable Community Development Code

DRAFT Sustainable Community Development Code Framework

RENEWABLE ENERGY

KEY STATISTICS:

- About 9 percent of electricity in the U.S. is generated from renewable sources
- Most electricity in the U.S. is generated by burning nonrenewable fossil fuels
- Proper solar orientation of new homes built in the San Jose area produced total energy savings of 11 to 16.5 percent—with up to 40 percent savings from space cooling
- Placing a building's long face on an east-west axis with a large percentage of windows on the south side can reduce fuel consumption by up to 22%
- Between 200,000 and 250,000 U.S. homes and businesses have solar panels today, a number that has increased by more than 40 percent a year since Congress passed a federal tax credit for solar energy in 2005



SITE DESIGN STRATEGIES FOR SOLAR ACCESS

	ACHIEVEMENT LEVELS			References/Commentary	Code Examples/Citations
	Brass (Good)	Silver (Better)	Gold (Best)		
  Remove Obstacles	<ul style="list-style-type: none"> Identify limiting provisions (e.g. accessory structure limits, historic district regulations) and craft exceptions to permit solar energy devices Prohibit solar restrictions in new private CCRs in subdivision regulations. 	<ul style="list-style-type: none"> Allow modest adjustments to side, front and/or rear yard setback requirements (or other conflicting regulations) that allow applicants to meet solar access requirements 	<ul style="list-style-type: none"> Override existing private covenants restricting solar devices Allow solar panels as a by-right accessory use except in special districts (e.g., historic districts) 	<ul style="list-style-type: none"> In the last five years, advances in technology have resulted in photovoltaic systems that can be installed in some roofing systems to make them nearly invisible—providing an alternative to traction panels in areas where aesthetics are of significant concern (e.g. historic districts). See US Department of Energy, Building America Best Practices for High-Performance Technologies: Solar Thermal & Photovoltaic Systems. Available online. Last accessed online 2/11/09. The LEED ND pilot program incorporates a section on Solar Orientation intended to, "achieve enhanced energy efficiency by creating the optimum conditions for the use of passive and active solar strategies." The section is one of twenty potential credits under the section entitled Green Construction & Technology. Available online. Available online. Last accessed online 2/11/09 	<ul style="list-style-type: none"> Los Angeles, Historic Preservation Overlay. Available online. Available online. Last accessed online 2/11/09. Fort Collins, Colorado Land Use Code, Solar Access, Orientation, and Shading. Available online. Available online. Last accessed online 2/11/09. Gresham, Oregon Development Code, Solar Access Standards. Available online. Available online. Last accessed online 2/11/09. Multnomah County, Oregon Solar Access Provisions for New Development. Available online. Available online. Last accessed online 2/11/09. City of Berkeley, California, Title 23 (Zoning Ordinance) Section 23D.04: Lot and Development Standards. Available online. Available online. Last accessed online 2/11/09. Teton County, Wyoming, Solar Access Regulations. Available online. Available online. Last accessed online 2/11/09.

Sustainable Community Development Code Beta version 1.2 97

Then each section has key statistics and begins with various suggested achievement levels to remove barriers - with links and references and commentary and examples of codes and other policies where these things have been done.

Sustainable Community Development Code

DRAFT Sustainable Community Development Code Framework						
RENEWABLE ENERGY						
	Bronze (Good)	Silver (Better)	Gold (Best)	Reference/Commentary	Code Example/Citations	
Create Incentives	<ul style="list-style-type: none"> Reduce or eliminate permit fees for the installation of solar devices on an existing structure 	<ul style="list-style-type: none"> Reduce building permit fees for projects that incorporate solar concepts in the overall design Provide staff assistance to homeowners to orient new homes for solar access 	<ul style="list-style-type: none"> Allow applicants to "earn" additional density or height by incorporating solar concepts into a project's overall design 	<ul style="list-style-type: none"> Database of State Incentives for Efficiency and Renewables (DSIRE). Available online. Last accessed online 10/29/08. The City of Tucson offers a tiered Solar Fee Incentive Waiver for new construction and renovation. Available online. Last accessed online 2/11/09. The City of Oakland, CA expedited its solar energy use through a 2001 initiative that waived design review requirements for installation of solar production facilities. The initiative expired in 2003; however, the city is evaluating the impact of this ordinance and evaluating the feasibility of its continuance. A range of articles and other materials on renewable energy are available in the American Planning Association's February 2008 PASInfoPacket entitled Planning and Zoning for Renewable Energy. Available online. 2/11/09. 	<ul style="list-style-type: none"> Esle County, Colorado Efficient Building Code. Available online. Last accessed online 2/11/09. Austin, Texas, Development Code, Subchapter E: Design Standards and Mixed-Use. Available online. Last accessed online 2/11/09. Pullman, Washington, Development Code, Planned Residential Development, Section 17.107 (incentives for solar access). Available online. Last accessed online 2/11/09. 	
Enact Standards	<ul style="list-style-type: none"> Require key features of a development plan to have access to sunshine Enact regulations to preserve solar access 	<ul style="list-style-type: none"> Require variation in width of lots to maximize solar access Include solar access as an optional or required standard in residential and commercial design guidelines Establish a tree siting regulation process and criteria by which property owners may resolve issues regarding the obstruction of solar access to a property by a tree or trees on a neighboring property 	<ul style="list-style-type: none"> Require a minimum percentage of solar-oriented lots or buildings in new developments Require a minimum percentage of energy in new developments to come from solar 	<ul style="list-style-type: none"> State of New Mexico Solar Collector Standards Act. Available online. Last accessed online 2/11/09. US Department of Energy, Building America Best Practices for High-Performance Technologies: Solar Thermal & Photovoltaic Systems. Available online. Last accessed online 2/11/09. Guide: Putting Renewable Energy to Work in Buildings. Available online. Last accessed on line 2/11/09. 	<ul style="list-style-type: none"> Fort Collins, Colorado Land Use Code, Solar Access, Orientation, and Shading. Available online. Last accessed online 2/11/09. Portland, Oregon, Solar Access Regulations. Available online. Last accessed online 2/11/09. Teton County, Wyoming, Solar Access Regulations. Available online. Last accessed online 2/11/09. 	

Next each section addresses creating incentives and enacting standards in the same structure of suggested levels of achievement information resources.

Can We Create a Full Resource Portal?

These are just examples to suggest that there is something more that is possible - a bigger universe.

What if entering the building regulatory realm felt more like going to a great restaurant?

What if you found menus filled with basic, good, better, and best practices tied to information about impacts, benefits, resources, incentives, guidance?

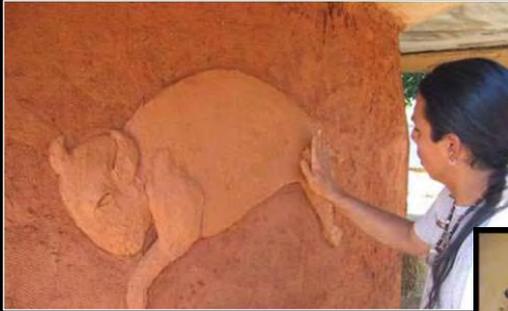
What if the process served more than just preventing the worst outcomes, but was, instead an integrated set of resources designed to enable the best?

Development Center for Appropriate Technology - 2012

I show those examples to open the door to the bigger set of possibilities that I think are available to tribes in developing a system that is truly appropriate, grounded in tribal culture, rigorous yet open to the necessary variations between places, communities, circumstances and more. So, what if entering the building regulatory realm was like going to a great restaurant where you found a well-developed set of menus that had everything from the basic requirements to good, better, and best practices, information about real impacts and benefits, all kinds of information resources to guide you toward the best decisions?

What if the process made it obvious that point is not just to prevent the absolute worst outcomes, but instead to enable the best ones? The good news here is that there are a number of communities where that shift has happened and the results are extremely encouraging.

Including Beauty and Cultural Appropriateness



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And of course, things like cultural appropriateness and beauty should be a foundational part of the system—an expectation, not something that may or may not be acceptable or tolerated.

Critical Context for the Tribal Codes Project

One last piece of context for this process... We all know about experts — people who come from outside with their "expertise."

At least as important are the inperfs — the people of a place, community or group, who have a very different kind of knowledge, experience and wisdom, that can only come from living in a place or community over time.

Let's acknowledge and continually remember that the tribes are the inperfs, in many cases having experts as well, and we are here to support them.

Development Center for Appropriate Technology - 2012

And finally, I want to share this crucial point of view, embedded in a word. My mentor and friend, the British architect John F. C. Turner taught me this term and it has proven to be invaluable. We all know about experts - people who come from outside with their ex-pertise. But there is another kind of knowledge, experience, and wisdom held by the people who are of a place, of a community or organization or group that only comes from living in a place or community over time. And the people who hold that are inperfs. They have inperftise which is equally valuable and essential. The tribes are inperfs and they have inperftise. I love the term because it gives standing to people who often have no standing against the experts.

And Let's Strive to Keep These Dots Connected

The Natural World



Ethics & Law
Culture
Government/Politics
Human Health/Safety
Atmosphere
Climate Stability
Ecosystem Health
Soil Fertility
Biodiversity
Water
Energy
Economy

Thank You!

Development Center for Appropriate Technology - 2012

And in the end, it is about working to keep the web of life intact and healthy - to keep the dots connected. All these systems, the ones we did not create and the manmade ones must work in harmony with each other. That is essential. Thank you!

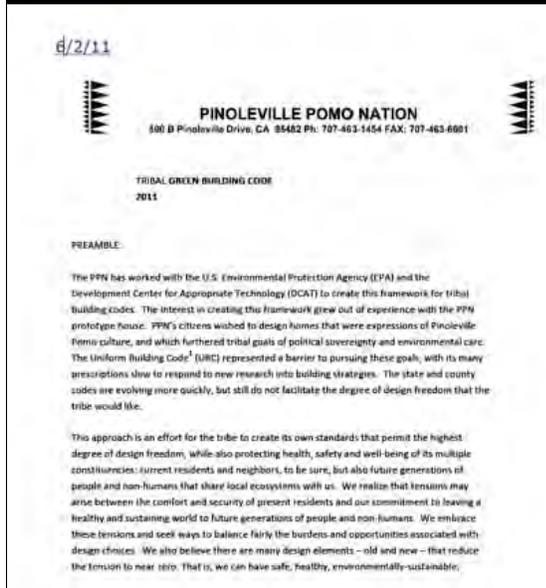
Pinoleville Pomo Nation Green Code Process

What follows are some additional slides from the presentation made to the tribal leadership at the Pinoleville Pomo Nation, where we had been working to develop a draft, performance-based framework for the built environment.

Development Center for Appropriate Technology - 2012

These are a few of the slides I showed last week to the tribal leadership at the Pinoleville Pomo Nation where we were doing work on their green housing efforts and the code they're developing.

PPN Draft Tribal Green Building Code



We have been working with the Pinoleville Pomo Nation in Ukiah, California on a new green code concept and structure.

The intent is to respond to conventional code concerns and emerging risks through culturally & environmentally appropriate regenerative building and land use.

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We are working with PPN on their own new code which aims to integrate cultural and environmental goals into their built projects.

PPN Draft Tribal Green Building Code

The PPN Green Building Code concept aims to provide appropriate technical, cultural, and ecological support for the Tribal Review and Approval Process for Built Projects—with Ultimate Decision-making Authority always *With The Tribe*.

It will build a library of best practices and will use a review committee appropriate for each project - with the potential development of regional and national committees for additional support.

This is an evolutionary approach that will continue to evolve and improve over time.

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We're building this code around a system that is being designed to support the tribal decision-making processes, giving them access to the technical and other information and expertise they need in a system that maintains the decision-making authority with the tribe at all times. This is not a regulatory hierarchy designed to control what tribes do but a resource and support system to inform the design and building process with appropriate technical input. It is also conceived of as a learning system that could have regional and national level structure including a hub for both finding and sharing lessons learned and other resources. The system is designed around a well developed review and advisory committee with technical expertise drawn from a larger team or pool of people who support the concept and are interested in helping develop and evolve it.

PPN Draft Tribal Green Building Code

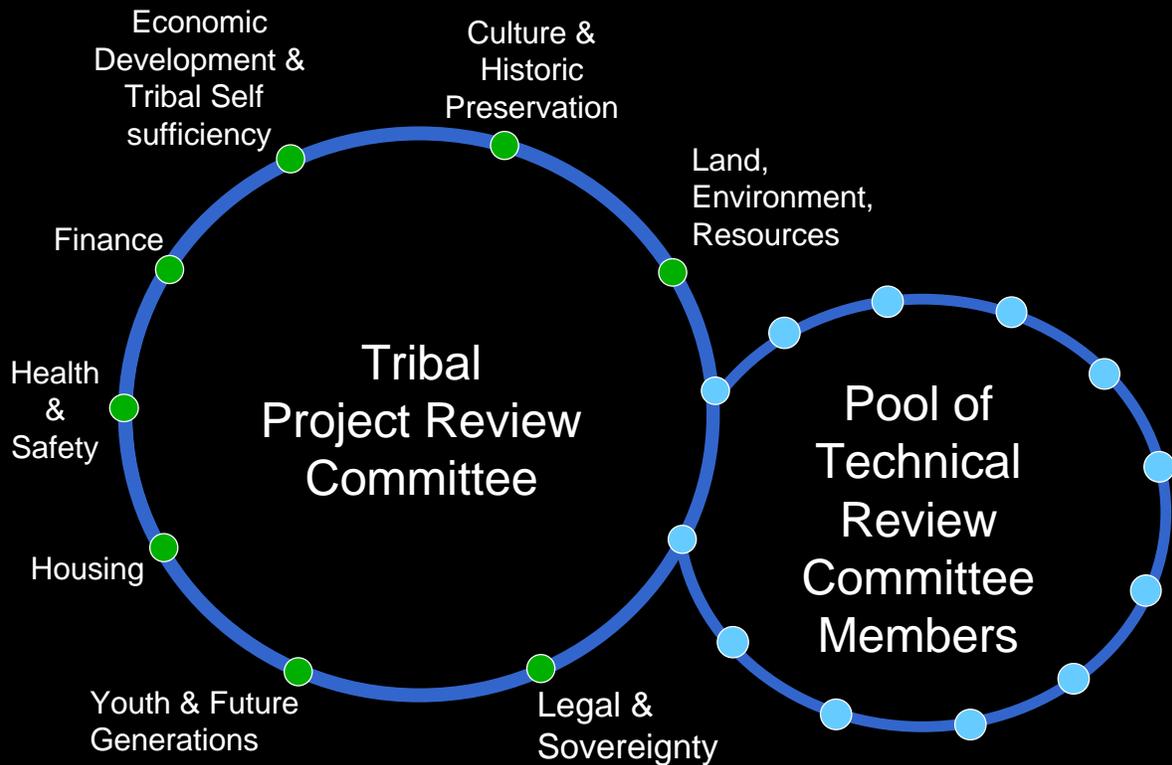
Membership will be as follows:

- One person nominated by the PPN Housing Department to assist with compliance, planning, and cost issues.
- One person nominated by the PPN Tribal Historic Preservation Office to assist with cultural and social assessments of designs.
- One person nominated by the PPN Environmental Department to assist with land resource use and other environmental assessments.
- One person nominated by the Tribal Council to assist with legal and regulatory issues, particularly to assess project impacts on tribal sovereignty and self sufficiency.
- One person nominated by the Tribal Council who can review designs and projects for impacts on human health and safety.
- Two persons from different organizations nominated by the Tribal Council who are qualified to review and interpret engineering and construction documents and to lead research into emerging building technologies and strategies. These persons shall also be able to evaluate regulatory and other barriers to construction.

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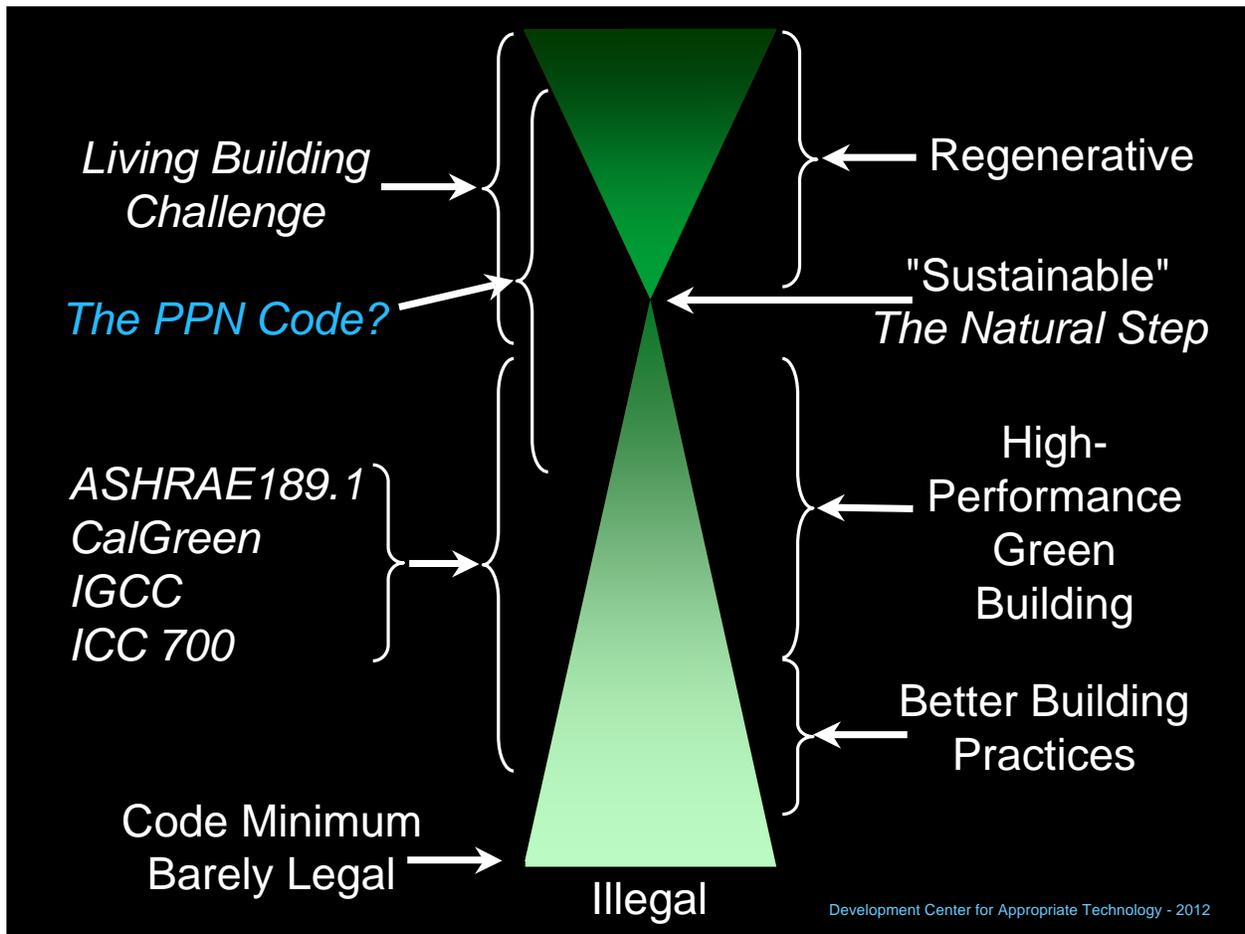
These are some of the potential categories of membership we have envisioned in the advisory/review committee. What is described as two persons qualified to review and interpret engineering and construction documents is being revised to be a minimum of two people chosen for their areas of expertise related to the needs of the project.

PPN Draft Tribal Green Building Code



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This diagram is a rough approximation of the concept with the tribal committee and the pool of technical members. We are also envisioning a regional circle made up of people representing the same set of things but perhaps coming from different tribes and other organizations. And similarly, there could be a national circle that would also, hopefully be tied to a national entity that would host the emerging library of best practices, case studies, standards, as well as potentially educational resources and more. We've begun talking with Dr. Daniel Wildcat at Haskell Indian University about the possibility of them being the repository for this.



When I was presenting the PPN tribal leadership I included this slide, inserting the PPN code into this framework.

Looking Forward

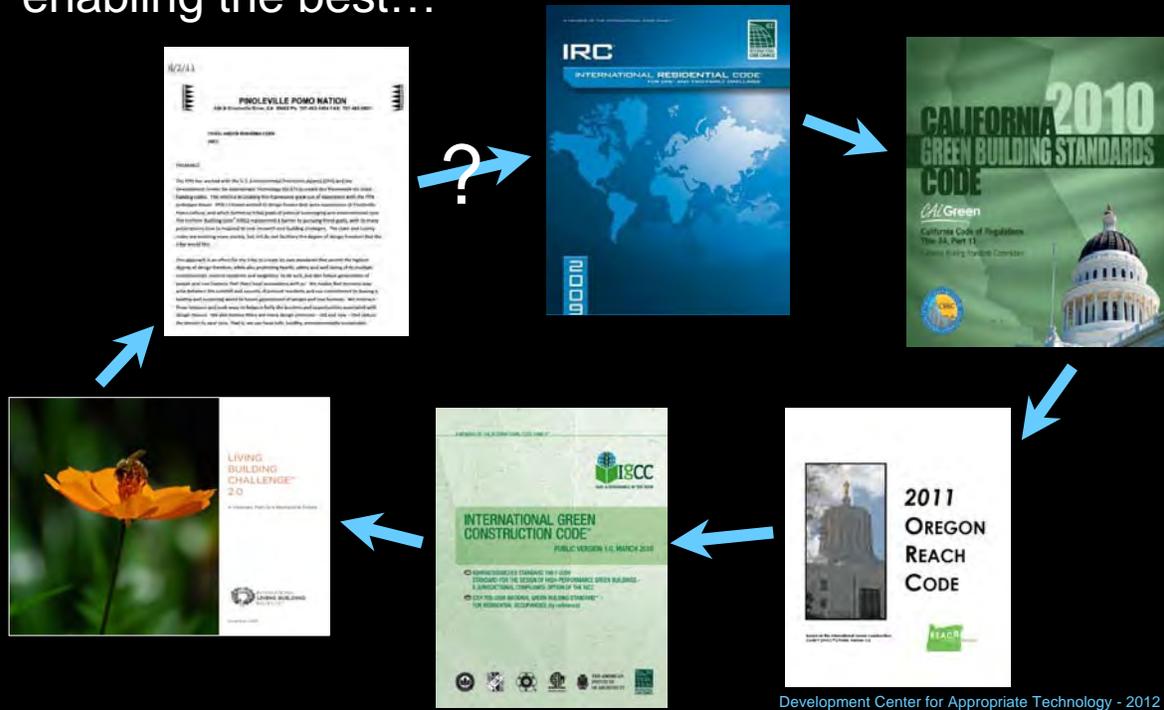
If this effort to create support system for a regenerative built environment on tribal lands is successful, it could help change much more...

Development Center for Appropriate Technology - 2012

I then spoke with them about what might happen if this effort is successful...

Minimum Standards vs Crucial Goals

An evolution - from just preventing the worst toward enabling the best...



So here we have the 2009 International Residential Code which is beginning to move in a more sustainable direction in some ways. Then we have the 2010 CalGreen Code, in which the state of California has incorporated a number of green practices and requirements into the mandatory code that everyone in California has to use - not a voluntary code or program. And we have another emerging kind of code where some more progressive states and jurisdictions are creating voluntary stretch or reach codes that go beyond the mandatory minimums and offer code guidance for much higher performance buildings. And in 2012 the International Code Council (ICC) will publish the first full version of the International Green Construction Code (IGCC) which will be part of the family of 2012 I-Codes next year. Then we have a much higher standard - the Living Building Challenge certification system. And soon we'll have the PPN code. And if all this turns out to work, and we can keep evolving it successfully, perhaps one day it will begin to influence the mainstream codes...

Questions?

We're interested in hearing about what you may want and need or are interested in regarding all this, and if and how we might work together...

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So there is an overview of the work we're doing and what we're striving to develop. We don't know if it will work, but we do know that it needs to be a process that is tribally driven and tribally owned, not one more thing imposed on tribes from outside...no matter how well intentioned. Thank you for giving me the opportunity to share that and now I hope we can explore what you think and what you want and need.



Thank you!

www.dcat.net/resources/index.php

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strawnet@aol.com

And please visit our website:
www.dcat.net

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

Thank you!