HAVING FUN

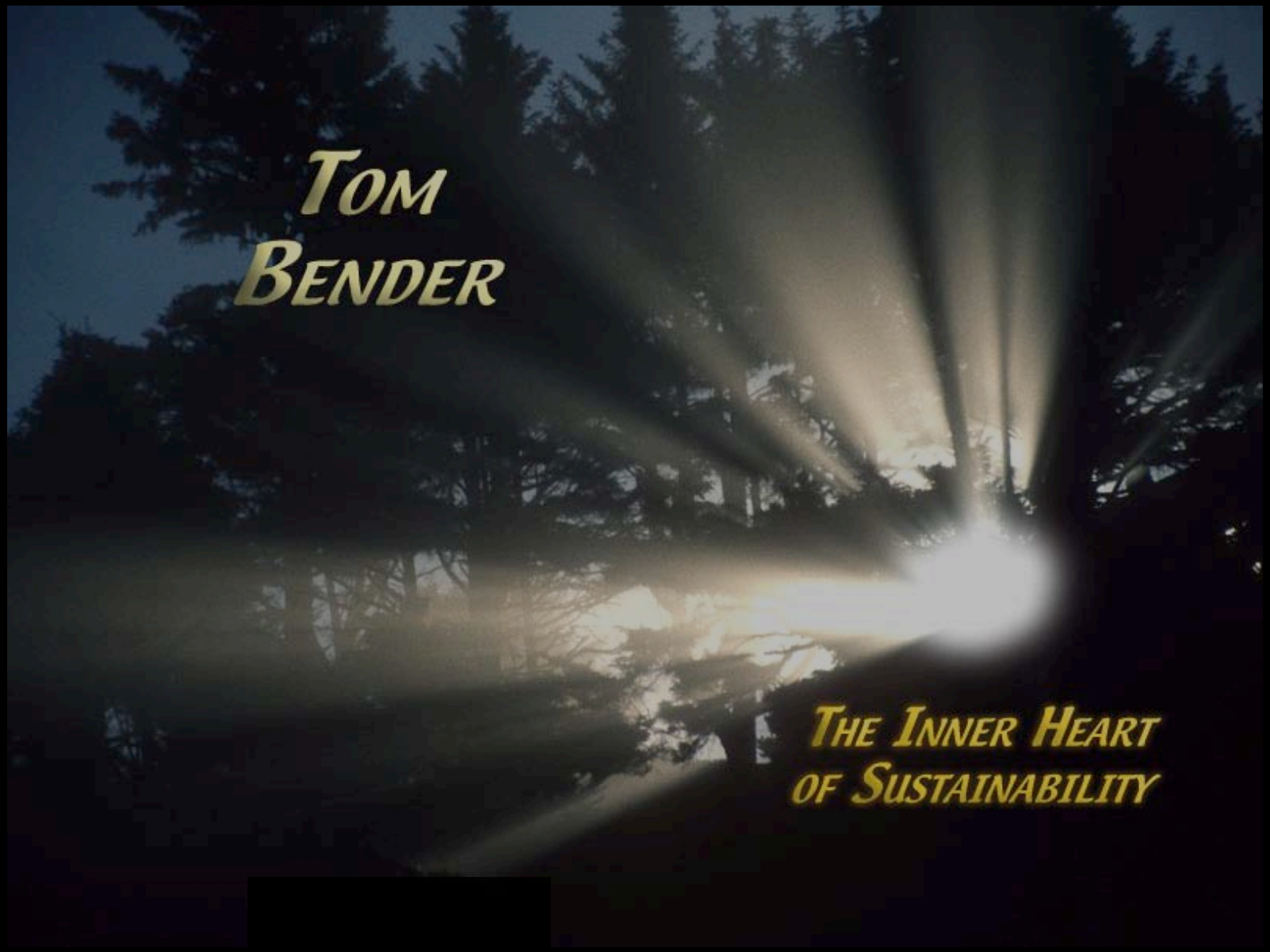
AFTER

DOOMSDAY!

ARCHITECTURAL RESPONSES TO CLIMATE CHANGE

ARE THESE
OUR NEW COASTAL CITIES?

DON’T THINK EVEN THEY CAN DO IT!

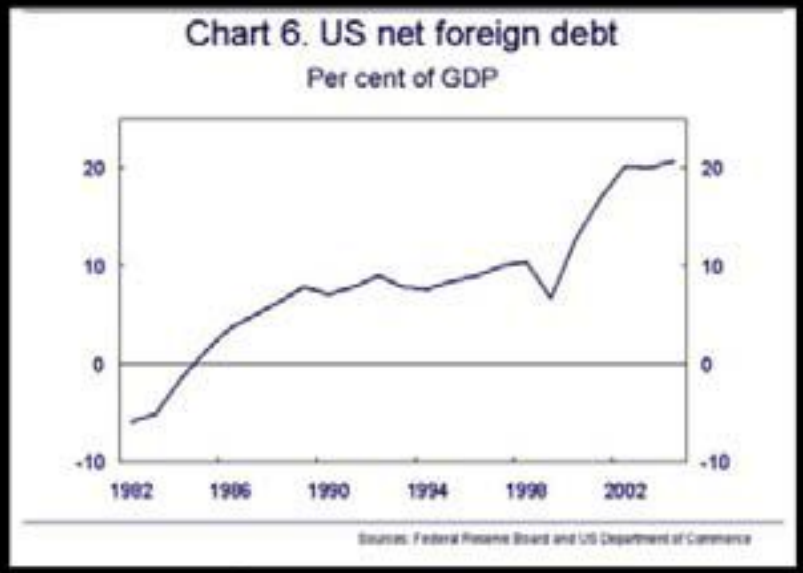


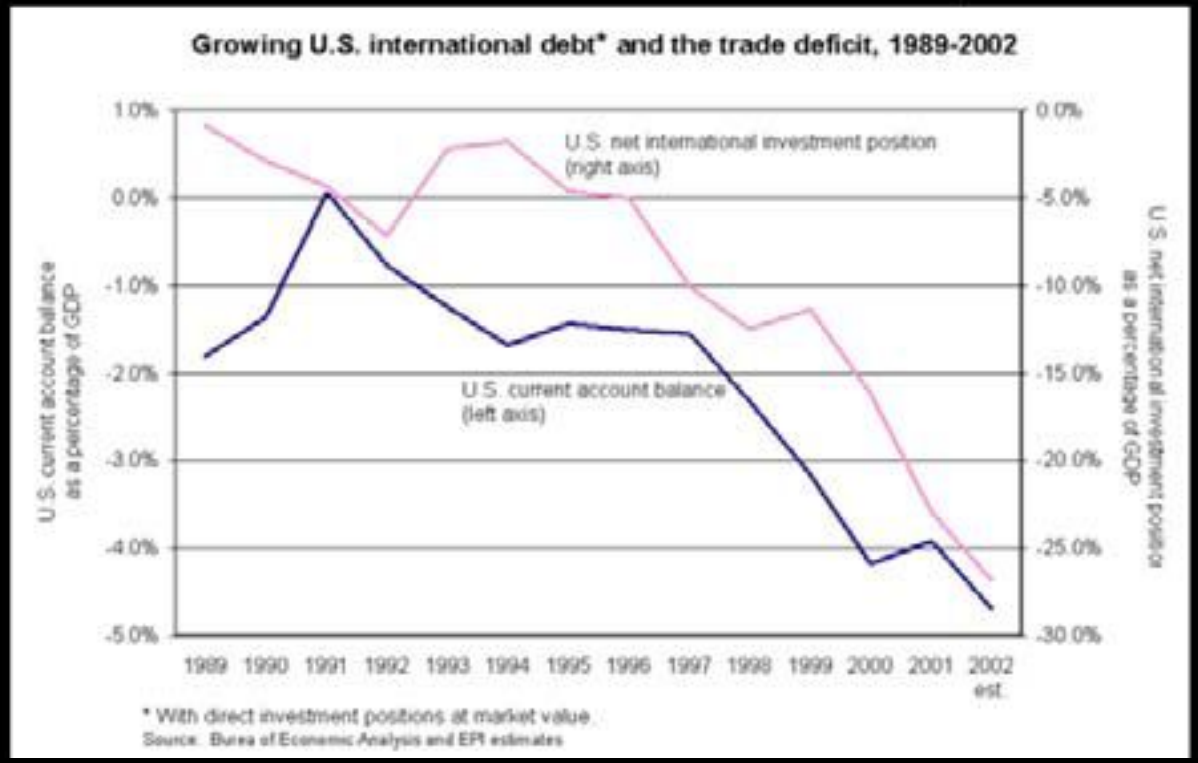
www.tombender.org

tbender@nehalemtel.net

GLOBAL WARMING, PEAK OIL, AND FOREIGN DEBT ARE FLIP SIDES OF THE SAME THING

THE HUGE U.S. FOREIGN DEBT INBALANCE IS TIED TO OUR DEPENDENCE ON FOREIGN OIL





THE FIVE HORSEMEN OF *OUR* APOCALYPSE

There are at least five major players in the transition we're in. They all interact - wildly - and all need to be tracked at the same time:

PEAK OIL. Yes, we *are* running out of all of our fossil fuels. Exponential growth and finite resources can't match, no-how. Everyone has been fudging how much is left. When things peak, (now) it changes to a seller's market. It takes more and more energy and money just to get what's left. And remember - most of our highways, building roofs, fertilizers, and plastic materials are oil-based.

GLOBAL WARMING. Again we can debate details. But glaciers and arctic ice *are* melting - way faster than thought. The interim impacts of more violent storms are already taking tolls. And actions proposed on state and national levels are way too meager and slow.

FISCAL FRAUD. Wow. A fantasy world of fake financial valuation and ownership - *nobody* can grasp. Two-thirds of Las Vegas homeowners owe more on their mortgages than the houses are worth. Dominos upon dominos of collapse here, quivering and ready to fall. The Kansas supreme court recently ruled that on most mortgages, nobody has standing to foreclose.

DEBT SPENDING AND FOREIGN EXCHANGE is probably the next to drop. The end of the dollar being the world's reserve currency for exchange. The beginning of April, China first ran up the flagpole at the Group 20 meeting dumping the dollar as the basis of international monetary exchange and foreign trade. The recent G-20 meeting endorsed it.

The result? Downside, the dollar value falls by half, import prices double. The upside? Oil-based foreign trade becomes less affordable. We can rebuild our industry with new low-energy technology. Local jobs, local production, for local needs. Cut transportation costs out of the equation.

OUR CULTURE OF LIES. OK, folks, here's the root of it all. We can't win unless we acknowledge we're a culture of lies, and get totally out of that game. The charade-dance of health-care reform is a lie. Every time we buy something

we take part in a game of deceit . . . Come on, gas at $2.99 a gallon is *really* $3 a gallon.

GLOBAL WARMING IMPACTS

THEY ARE REAL,
AND
ALREADY HAPPENING

WHAT THIS IS REALLY ABOUT IS SHIFT FROM GROWTH TO SUSTAINABILITY

It’s unavoidable, it’s here, it’s something to celebrate!

We're entering a
PROFOUNDLY NEW
era.

Our literate-rational-mental dominated world is
JOINING TOGETHER

with our qi-energy consciousness

integral with the rest of Creation.

Wa-hoo!!! This is something TOTALLY new!!!

Now EVERYTHING changes!!

Values

Sciences

Education

Economics

Work and Play

Communities

Health

Life and Death

Corporate-greed culture has destroyed our communities.

Corporate-greed culture has created a world of war, hate, and rage.

Corporate-greed culture has destroyed our souls.

IT'S TIME
TO FREE
OUR
HEARTS
FROM THAT
WORLD.

GLOBAL WARMING/ SUSTAINABILITY IMPACTS ON ARCHITECTURE:

- NEW VALUES
- "TRANSFORMED" ARCHITECTURAL THEORY AND PRACTICE
- SHIFT IN CLIENTELE
- SHIFT IN OFFICE SIZE/ORGANIZATION
- SHIFT IN PROJECTS
- NEW ECONOMICS
- NEW SCIENCES
- RETURN OF THE SACRED

Design is different in a sacred world.

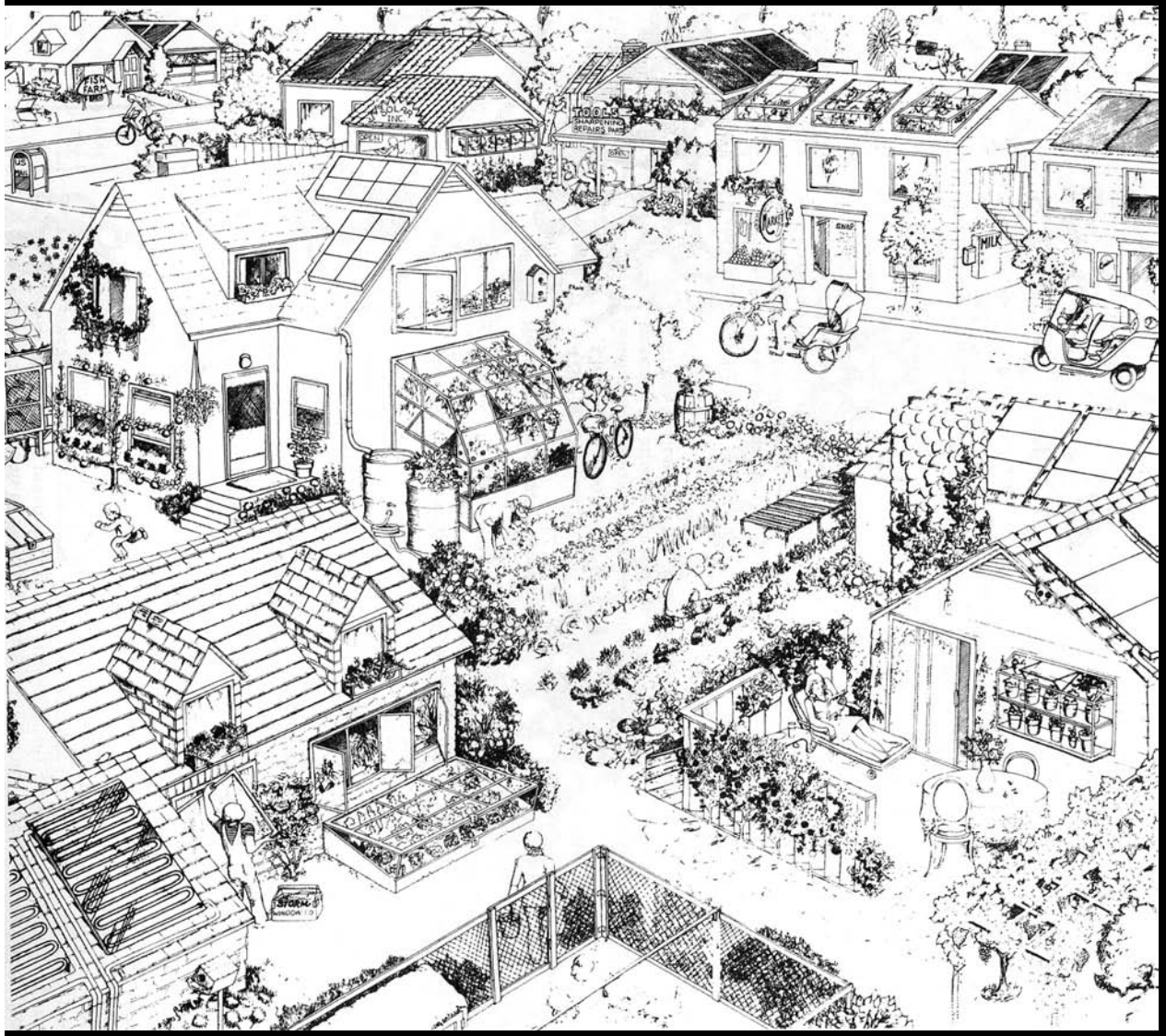
Place, not space -
our world extends beyond
the spatial realm.

Relations, not structure -
connection
is primary.

Meaning, not aesthetics -
inner aspects
are central.

Love, not dazzle.

Truth is the heart
of design.



BETTER USE OF EXISTING INFRASTRUCTURE

- Suburban renewal
- Reuse of empty
  - strip-malls
  - gas-stations
  - freeways
  - skyscrapers
  - and big-boxes

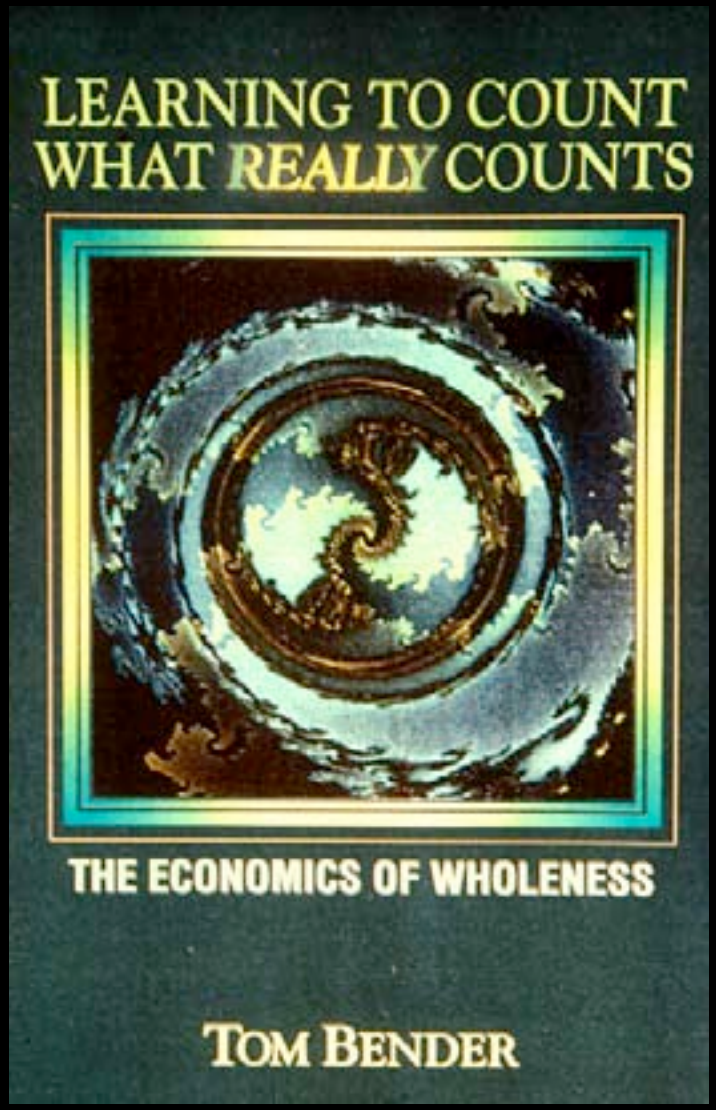
ECONOMICS HAS NO BOTTOM LINE

Bottom-lines exist only in linear calculus.
Single focus, ignoring the multitudiness of life.

Life is a web of webs. Any change pulls here, loosens there.

Everything is touched, and shifts. Bringing all again into true.

Feel and dance with those tugs of life.



Our “economics”
was an intentional fraud,
to justify
exploitive
corporate practices.

SUSTAINABLE
ECONOMICS
embraces
systems,
ecology,
life-force energy,
and the sacred.

remember . . .

EXTRAVAGANCE

is the economics of nature

SUSTAINABLE CITIES???

THERE IS NO EVIDENCE
TO ASSUME
THAT CITIES,
AS WE KNOW THEM,
CAN BE SUSTAINABLE.

Cities are artifacts
of concentration of wealth and power,
global economic exploitation,
and vast expenditures of energy.
VILLAGES, however, can be sustainable.
And effectiveness of all city systems can be improved ten-fold, for starts.

THE REALLY GOOD NEWS. . . .

90% REDUCTION

IN OUR
ENERGY AND DOLLAR
EXPENDITURES

CAN BE ACHIEVED
QUICKLY AND SIMPLY
There *IS* enough for all!

VALUE SHIFTS

can give us easy, multiple paths to reduce our energy use by 80-90%, and have better lives in the process:

GROWTH:

Stabilizing growth can totally avoid somewhere between 33% and 40% of our total work.

Every generation we double the number of our houses, cement plants, electrical generating plants, coal mines, cities, roads, and water systems - and prematurely demolish existing ones - to accommodate more people and more "things". And we spend even more educating more people. What do we gain, anyhow, from more people?

INEQUITY:

An equitable society can totally eliminate poverty and support EVERYONE at the current median income, using 47% less work, and equivalently fewer resources than our current society uses to maintain poverty and inequality!

Without growth and inequity, every American could live as well as the average American family does now. At the same time, we would save TWO-THIRDS (67%) of the resources, energy, work, and ecological damage involved.

DEBT:

Debt represents more than 20% of our cost of living.

Interest costs on home purchases more than double the actual cost of a home. We finance 13 cars in our lifetimes -one automobile after another for 40 or 50 years, gaining nothing out of the process beyond the first purchase. Interest on continuing credit card balances amounts to over $300 billion per year. We can't buy any more on credit. We just end up paying more for what we buy - up to 20% more. Consumer debt represents 20% of disposable income. Corporate and government debt loads represent a similar 20% surcharge.

- These three "value questions" show potential for 75% savings before even looking at the potential for 90% reductions in HOW we do thing.

AND *THEN* . . . . .WHAT IF WE:

- **Eliminate EXCESS.** The European economy is 50% "consumer" loaded. Ours is 70%. **Reducing our consumerism of geegaws by 30%, we would still live as well as Europeans, and cut work and energy use by almost 25%.** (That can give 12 more weeks of vacation a year!)

- **Eliminate CORPORATIONS.** Localize, network, share. Ads = 20%, corporate hierarchy 10%, layer inefficiency 10%??

- **Improve DURABILITY. A home that lasts 200 years rather than 20 years costs 90% less.** A car or light bulb or roof on a house that lasts twice as long only costs half as much. Much of our energy consumption is producing things that don't last and aren't repairable. **Durable products mean less work and energy to replace, with a positive impact on quality of life in the process.**

- **Find RIPPLE EFFECTS.** If we cut unnecessary stuff by 20%, use those $$$ to get out of debt, we cut energy, financial, and resource consumption *another* 20%. Not building means our forests can recover, restock, sequester CO2.

EASY CHANGES IN OUR EVERYDAY LIVES

can also easily reduce our energy use by 80-90%, and also give us better lives in the process.

HOUSING:

- **Smaller size - Cutting our excessive space use in half cuts our energy use in half.** Average new home size in 1968 was 1200 sq.ft. vs today's 2400 sq.ft. IKEA has demo homes in their stores showing how to live comfortably in 590, 375, and even 235 sq.ft.

- **Two-story** - 1.5 story construction **reduces construction costs and energy use 20%.**

- **Super-insulated/passive solar** - Heating constitutes a third of home energy use. European Passivhaus homes are insulated to levels that need no heating systems, thus **eliminating 33% of home energy use.**

- **Appliance load reduction** - Eliminating TV; using cool-boxes and under-counter freezers instead of mega-refrigerators; demand, solar, and heat-pump water heaters; CFL light bulbs; gas , not electric stoves; and high-spin speed clothes washers to reduce drying loads can **cut appliance primary energy use roughly in half.**

- **Stairstep electrical tax** - Doubling electrical rates for large users, investing those funds in efficiency improvements and renewable electricity, can save even more.

- **Solar PV** - Reducing electrical use to non-heat appliance loads, and reducing those loads allows affordable rooftop solar PV to further reduce total fossil fuel energy use.

These options can approach net zero energy in new homes, and 80% reduction in retrofitted homes. They also give security during power outages and disruptions.

TRANSPORTATION: We still love cars, and available options can give us massive improvements in both efficiency and amenity:

•**More efficient cars** - This doesn't mean fancy hybrids. The 55 mpg Honda Civic VX, back in 1992, or the 74 mpg VW Polo now available in Europe can make this possible quickly. **A 66 mpg car (VW Polo) reduces fleet energy use by two-thirds.**

•**45 MPH speed limit - can reduce energy use by 25%.**

•**European workweek** - Adopting the European 32 hr workweek **would lower our transportation energy use by 20%.**

•**CarShare** - CarShare systems avoid car ownership, storage space, maintenance, insurance costs. Each car-sharing vehicle replaces as many as 7 private cars. The average CarShare member spends $540 and drives 435 miles per year, vs. 10,000 miles. **Adjusting for transit use, this probably represents an 80% reduction in mileage/energy use.**

•**Smart Jitney** - Jitneys are shared taxis that carry multiple passengers over a regular or flexible route on a flexible schedule. They provide anywhere - anytime - anyplace pick up and drop off. *Smart jitneys* add a GPS cell phone for efficient accessing. This is already in development in Britain and Germany. **Tripling occupancy cuts energy use threefold.**

• **Live where you work, walk and bicycle** - Obviously simple ways of reducing energy use.

These can reduce personal transportation energy use by 70-90%.

FOOD: U.S. agriculture currently consumes 10 times the energy that it produces in the food. We can:

- **Switch to organic food** - **A 2007 UN study showed organic production using an average of 50% less energy than conventional,** while producing more nutritious food.

- **Eat less** - Americans consume 3,600 calories per day vs. need of about 2,500. **Stopping overeating and ending obesity can reduce energy use by one-third.**

- **Buy local - 40% of energy use in food goes into processing, packaging and distribution.** Buying direct from local producers, or from your own garden, avoids such costs.

  Bio-intensive home gardens reduce energy use by 90%, provide fresh food under your own control. Small U.S. farms, under 27 acres, are 10 times more productive than the largest. Standard U.S. agricultural requires 45,000 square feet to feed a person on a high-meat diet, or about 10,000 square feet for a vegetarian. Bio-intensive gardening can provide for a vegetarian's entire diet, plus the compost crops needed to sustain the system, on only 4,000 square feet. You can produce 40% of your food needs around your house on a standard 50'x100' urban lot.

- **Eat lower on the food chain** - An industrial meat-based diet consumes twice the energy as a plant-based one. **Cutting meat consumption in half reduces diet energy by 25%.**

Just these four measures can reduce food energy expenditures by 85%.

And finally, consider "techie" energy efficiency directly.
Major shifts have already happened in our own homes:

- New toilets only use one gallon of water to flush - an 80% improvement over the 5-gallon flush of 20 years ago.
- Compact fluorescent light bulbs save 75% of the energy used by incandescent bulbs.
- Refrigerators reduced their energy use by 86% from 1972 to 1997.
- High-speed-spin clothes washers reduce dryer energy use 90%.
- Laptop computers use 90% less energy than older desktops.
- NAHN R-60/40 homes cost less than conventional.

A NEW HOUSING PARADIGM:

How to Reduce Housing Costs by 80% in 20 Years

The primary beneficiaries of the homeownership structure used in the U.S. since 1950 have been finance organizations and energy companies, not homeowners.

There are three primary (and roughly equal) components to our housing costs:

Interest payments on a 30 year, 6.5% mortgage costs 28% more than the cost of the home. Energy operating costs also equal or exceed construction costs, and will be increasing rapidly. Construction, finance, and energy costs are all paid out of the same pocket.

A housing paradigm designed to minimize housing costs rather than to transfer wealth to entities other than residents can bring profound savings to all residents, and make housing affordable to all.

A structure which can accomplish this is linked community-resident ownership of homes through "community land trust" frameworks. This can remove profiteering, provide residents a full bundle of "ownership rights", and ensure permanent on-going affordability.

Some elements of such a structure:

- Use "Net-Zero-Energy" construction for new homes, which can bring their net energy use near zero. "NZE" retrofits of existing homes can also reduce their energy use by up to 80%.

- Eliminate the finance component of trust-owned housing (pay off in 25 years). This equals a reduction in housing costs – in perpetuity – equal to the entire capital cost.

- Reduce the construction cost component via "free land", smaller homes, efficient construction, shared design and engineering, sweat-equity, public subsidy, appropriate reduction of SDCs, and elimination of "overdone" systems and amenities.

- Develop a surplus of housing, so market prices of existing (paid-for) homes trend toward maintenance costs rather than comparable costs of new construction.

- Employ CLT resale restrictions so homes stay affordable in restrictive markets.

- Eliminate inflation/market price increases in BOTH land and housing prices via ongoing trust "ownership" of land and housing. At our historic 3% inflation rate, prices double in 20 years. Therefore trust ownership can, in effect, cut the comparative purchase price of homes in half in 20 years.

- Reduce cumulative transfer costs on trust-owned land and housing. Where both house and land are trust-owned, this could amount to 1/3 of the purchase cost of a house over a lifetime.

- Rework existing oversized home stock to provide virtually free accessory dwelling units.

In 20 to 25 years, this can reduce total housing costs by two-thirds. In a few more years, these and other mechanisms can further reduce costs to virtually maintenance costs.

SURPRISE! ADS HIDE TRUE COSTS:

What is the REAL cost of an island to fill an oversized kitchen?

Cabinetry purchase $1000
Space cost: 60 sq.ft. x $150 = $9000
Finance cost: 30 years = 1.28 = $11,520
Energy for space: $9,000
Subtotal: $30,520
Income tax on earnings to pay @25% = $7630

Total cost: $38,150

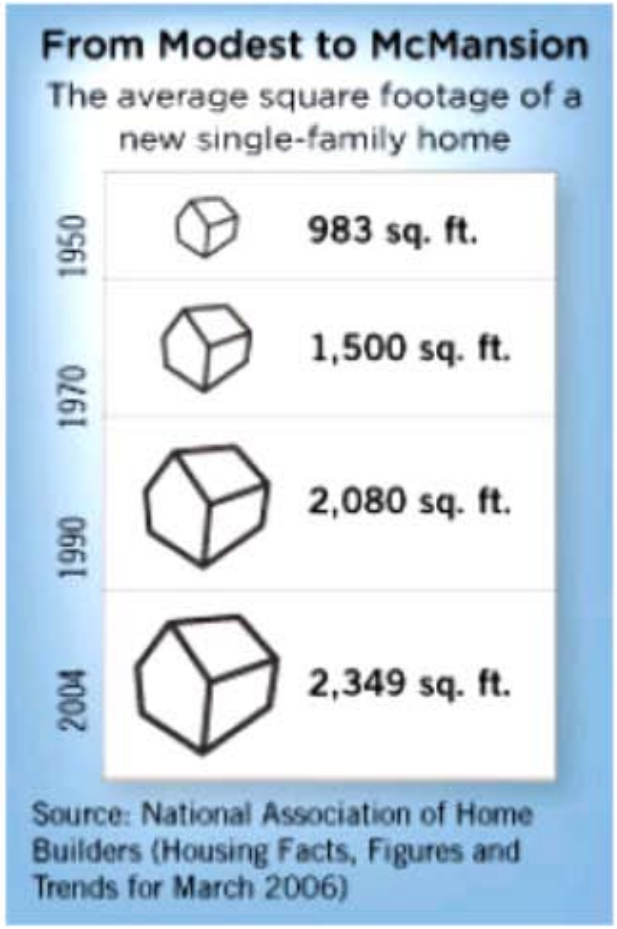
More than a year's wages for many people - just for an island to fill an oversized kitchen.

What is the REAL cost of a guest bedroom to fill an oversized house?

Furnishings: $1000
Space cost: 150 sq.ft. x $150 = $22,500
Finance cost: 30 years = 1.28 = $28,800
Energy for space: $22,500
Subtotal: $74,800
Income tax on earnings to pay @25% = $18,700

Total cost: $93,500

What's the REAL cost of an OVERSIZED home?



SMALL IS BEAUTIFUL HOME:
Space cost: 1200 sq.ft. x $150 = $180,000
Lot, @30% = $54,000
Finance cost, with same payments as for 2400 sq.ft. house: 9 years = $75,700
Energy for space: $180,000
Subtotal: $489,700
Income tax on earnings to pay @25% = $122,425

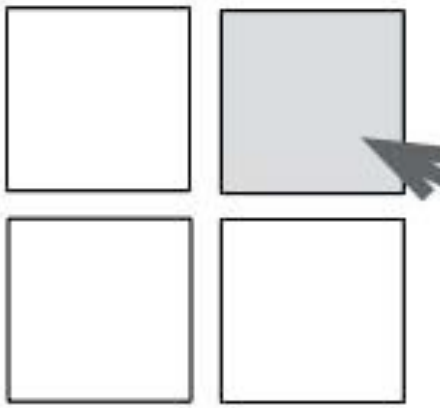
Total cost: $612,125

SUPERSIZED HOME:
Space cost: 2400 sq.ft. x $150 = $360,000
Lot, @30% = $108,000
Finance cost: 30 years = 1.28 = $599,040
Energy for space: $360,000
Subtotal: $1,427,040
Income tax on earnings to pay @25% = $356,760

Total cost: $1,783,800

Free Housing in 25 Years?

A mechanism is available to Community Land Trusts to get out of our "debt trap" of perpetually-cycling finance costs for housing. The IRS requirements for CLTs permit up to 25% of their units to be "market-rate rentals." Use of this provision, along with other aspects of CLT programs, can permit major shifts in housing costs over the time cycles in which CLTs operate.



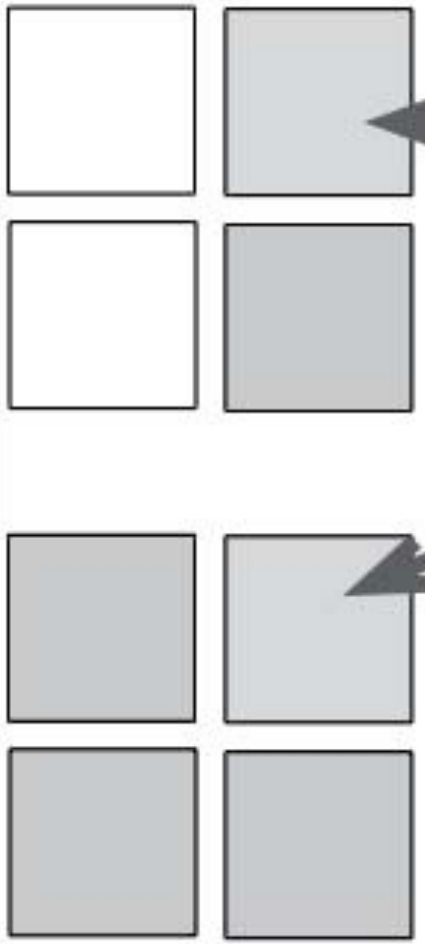
Year One

A CLTs 25% initial Market Rate Rental units can be rented at market rates. But assuming reduced costs [here free land (30% of home cost), profit elimination, and efficient design and construction (10% reduction)], the mortgages can be paid off ***in 12 years*** rather than 30. (A 30-year loan at 6.5% interest, ends up costing interest charges of 128% in addition to the initial cost of the home.)

Income from those mortgage-free MRR units can then speed payoff of more of the existing units, as they turn over.

Year 12

At 12 years from start, the CLT would have 25% of its units paid off.



Year 18

Year 24

Then the total market rate rent income from those units becomes available to pay off other units.

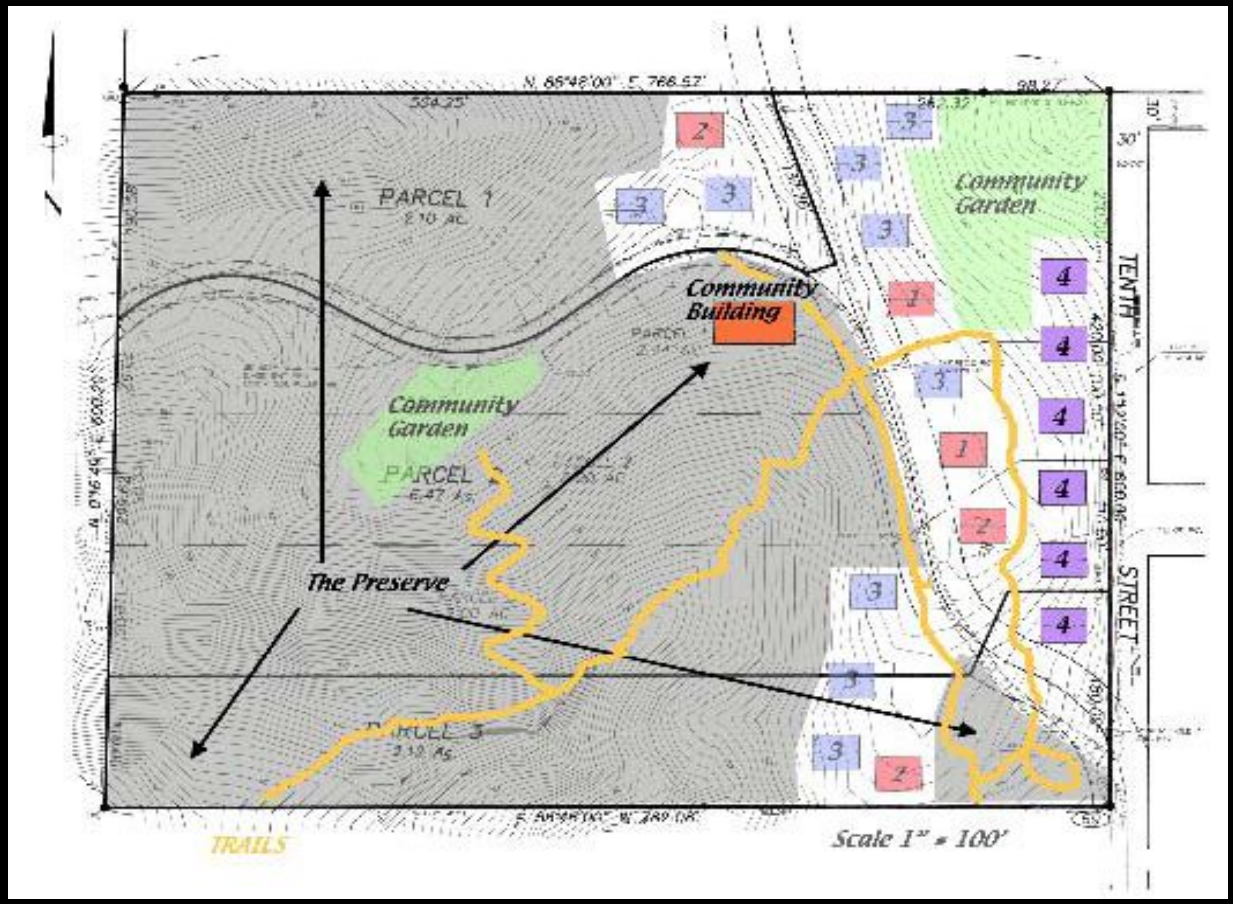
In 6 more years, the CLT would have 50% of its units paid off, as the income from the market rate units combines with income from a third of the low-income units to pay those units off faster.

Then the total income from that *half* of the units is available to speed payoff of *remaining* half of the units. It would take another 7 years then, (24 years total) for the CLT to pay off the remaining 50% of its units.

In 24 years, all the housing is paid-off and "free." The economic cost of construction is paid, and the equal or greater finance cost for all the homes eliminated - forever.

At this point (or any point along the way) a CLT can:

- expand the number of homes, mortgage-free, towards market saturation, or
- convert the rentals into lease-hold housing, or
- lower CLT leese fees to 3% (equivalent to interest-free in 3% inflation US market).



NEAHCASA IS WORKING ON A DEMONSTRATION OF NET-ZERO-ENERGY FLEX-PLEX COMMUNITY LAND TRUST HOUSING THAT EMBODIES THESE NEW PATTERNS.

TILLAWATTS: **Net-Zero-Energy retrofits of existing homes can reduce energy use by 80% An Accessory Dwelling Unit Ordinance can permit splitting existing 3-bedroom ranch homes that are 50% of our housing stock. Together, they can give us:**

- **"Negawatts" for the electric utility** (ie. us) cheaper than any new generation, cutting fossil fuel use, global warming, and foreign debt.

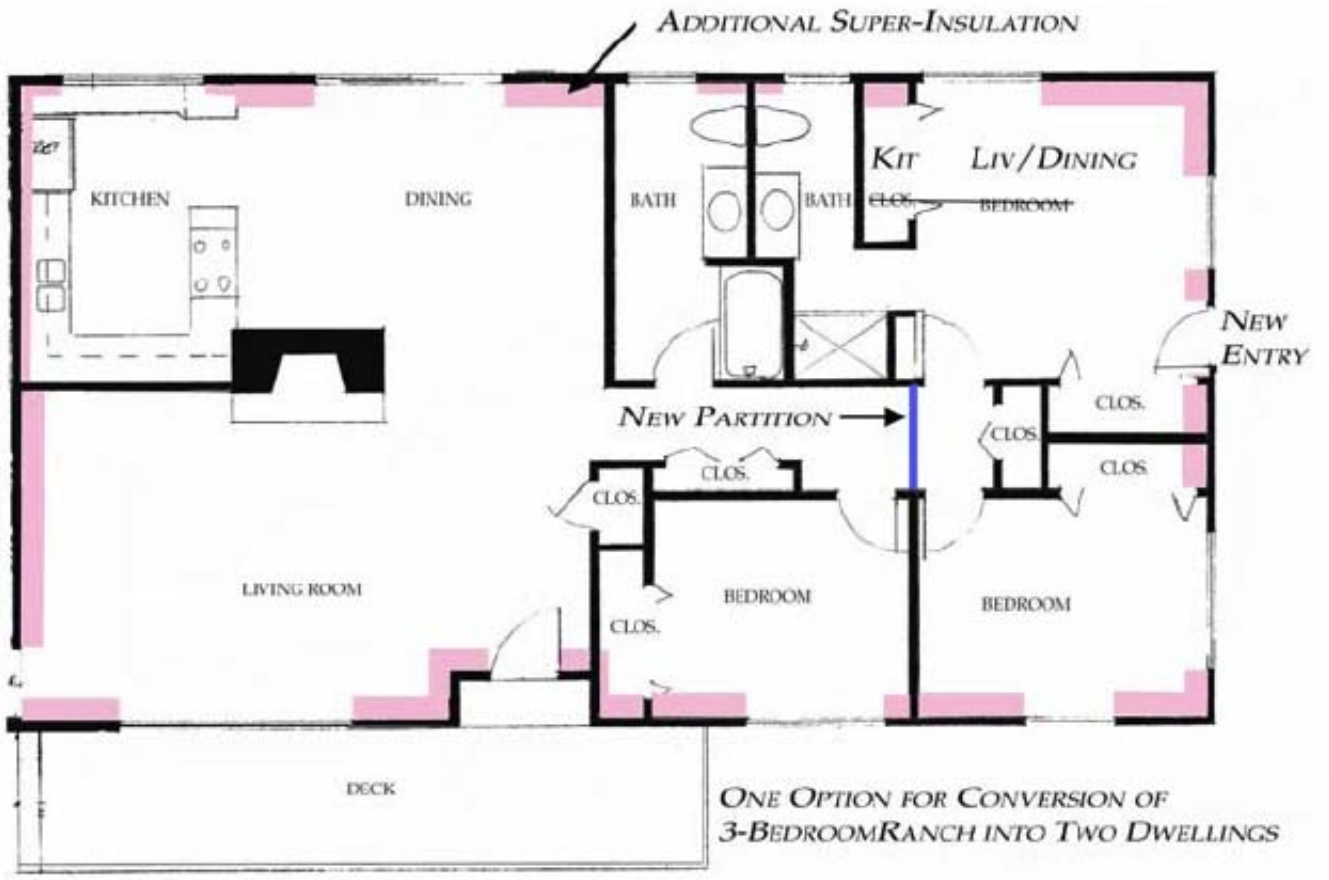
- **"Storm-proof" homes** for residents, who can stay warm in power outages or whatever economic collapse occurs.

- **Affordable housing** at a fraction of the cost of construction.

- **Potential income to retirees** who have lost income from the stock market crash.
- **Enhanced ability of existing infrastructure** to serve twice as many residents.
- **Local-employment-intensive investments**, 100-year returns.

- **Better transportation and community** from improved housing density.

- **Capacity for electric vehicle transportation** within our hydro-electrical base.



Here two one-bedroom units are created with just a hall partition.

ARCHITECTURE IN THE REALMS OF SPIRIT

Only our spirits
can enter
the realms
of the sacred.

No mind,
no intellect,
no literacy.

They
may bring us
to the gateway,
but not within.

I suspect the greatest opportunities for EBG members in coming years lies in:

- Developing innovative ways to reuse existing and abandoned infrastructure.

- Assisting individuals, businesses, and communities to do NZE retrofits of existing buildings.

- Helping develop and house new and interactive community-based institutions to replace our over-centralized, over-legalistic, and ineffective present ones.

- Showing how to put soul into our places in the process of the above.

Our integrative, wholistic thinking is the most vital tool for making all the changes we need!

THE NORTHWEST ECOBUILDING GUILD

has always known all this,
and been developing the needed architectural responses.

THANK YOU FOR YOUR GIFT TO US ALL!

SOME ARTICLES ON TOM BENDER AND NEAHCASA WEBSITES:

“Oregon Coast Impacts of Global Warming”
"Our Homes are a Goldmine"
"TillaWatts”
"Beyond an Overstuffed World”
"Quick and Simple Answers”
“Flexplexes”
"The Realms of Spirit"