HOMES WE CAN LOVE. . . AND AFFORD!

How to have better homes . . . . at a tenth the cost of present ones!

Forty years ago, someone told me we will need to reduce our consumption of energy and resources by 90%, for there to be enough for everyone.

- *I wondered if that was possible . . . and discovered that it is!*
- *Even better, I learned our lives will be enriched as we do so.*
- *There are multiple ways to reach that goal. Here are some of them:*

When the homes of other cultures -
even very poor by our standards -
contain beauty, love, community,
and connection with the sacred;
and ours can only breed crime,
sickness, and despair -
there is something wrong
with what we are doing.

There can be freedom in our homes
for humor, joy, celebration,
sharing, and community.

Living lightly, honoring all of creation,
touching deep into the energy
that creates the world we see -

There suddenly becomes boundless time
to touch and be touched -

by the hearts of others,
by the beauty and wonder of our world,
by the diversity of people
and culture and dreams,
by the limitless possibilities
that lay before us.

** Making homes filled with beauty from the heart, that feed our souls, doesn't cost money.*

** There's no reason finance charges on a home should cost ten years of family income.*

** There's no reason homeowners should pay more than the cost of a home for the honor of exhausting all the fossil fuels on our planet to operate the home.*

CONVENTIONAL "PICKPOCKET ECONOMICS"
TWISTS HOW WE DO THINGS.
IT ONLY SHOWS WHAT PROFITS THEM,
ADDING HUGE UNNEEDED COSTS.

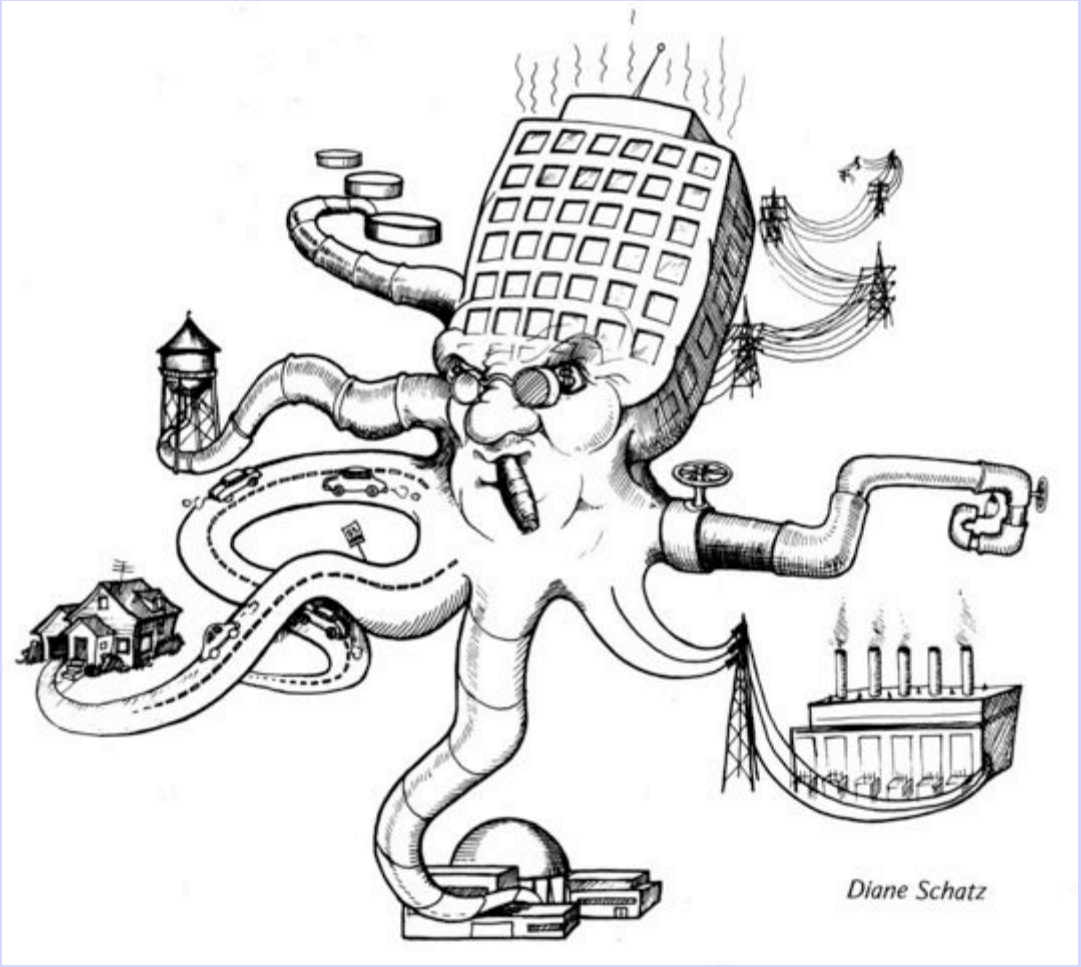
TO BE SUSTAINABLE, ECONOMICS NEEDS TO LOOK AT ALL HOUSING COSTS.

Two primary issues are more important than housing <u>COSTS:</u>

- *If housing supply is LESS than demand, prices of existing homes rise to costs of new construction. If supply is MORE than demand, prices drop towards maintenance costs. To lower costs, supply often needs to be increased.*

- *Requiring LIVING WAGES can be a far more effective means to achieve housing affordability than complex and expensive government programs.*

I. WHAT ARE THE ELEMENTS OF HOUSING COSTS?



A building's finance costs, energy use, infrastructure costs, transportation impacts, durability; the income levels in the community, land costs, housing shortage or surplus, and many other elements interweave and affect each other.

WHAT THE ADS DON'T TELL US:

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

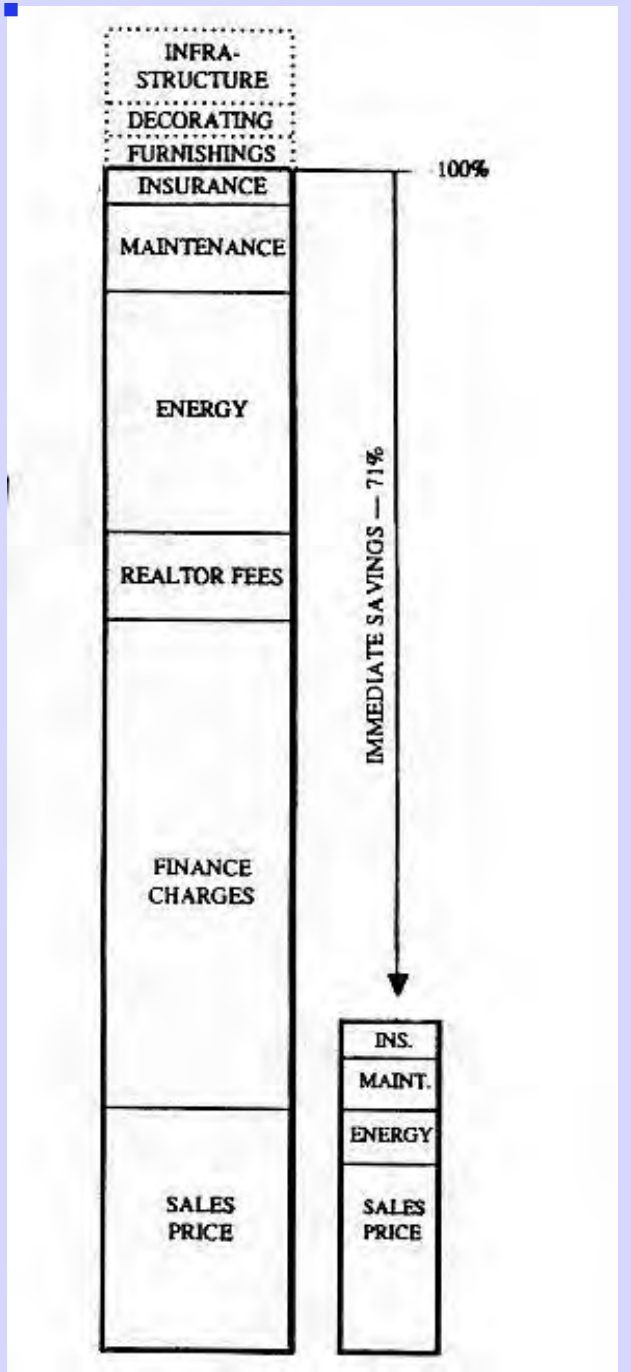
Total cost: $93,500

My 1981 study showed construction cost <u>is not</u> the cause of housing unaffordability.

At that time, it was 16% finance costs, plus energy costs.

What is it now?

See: www.tombender.org/factor10econarticles/hiddencosts.html



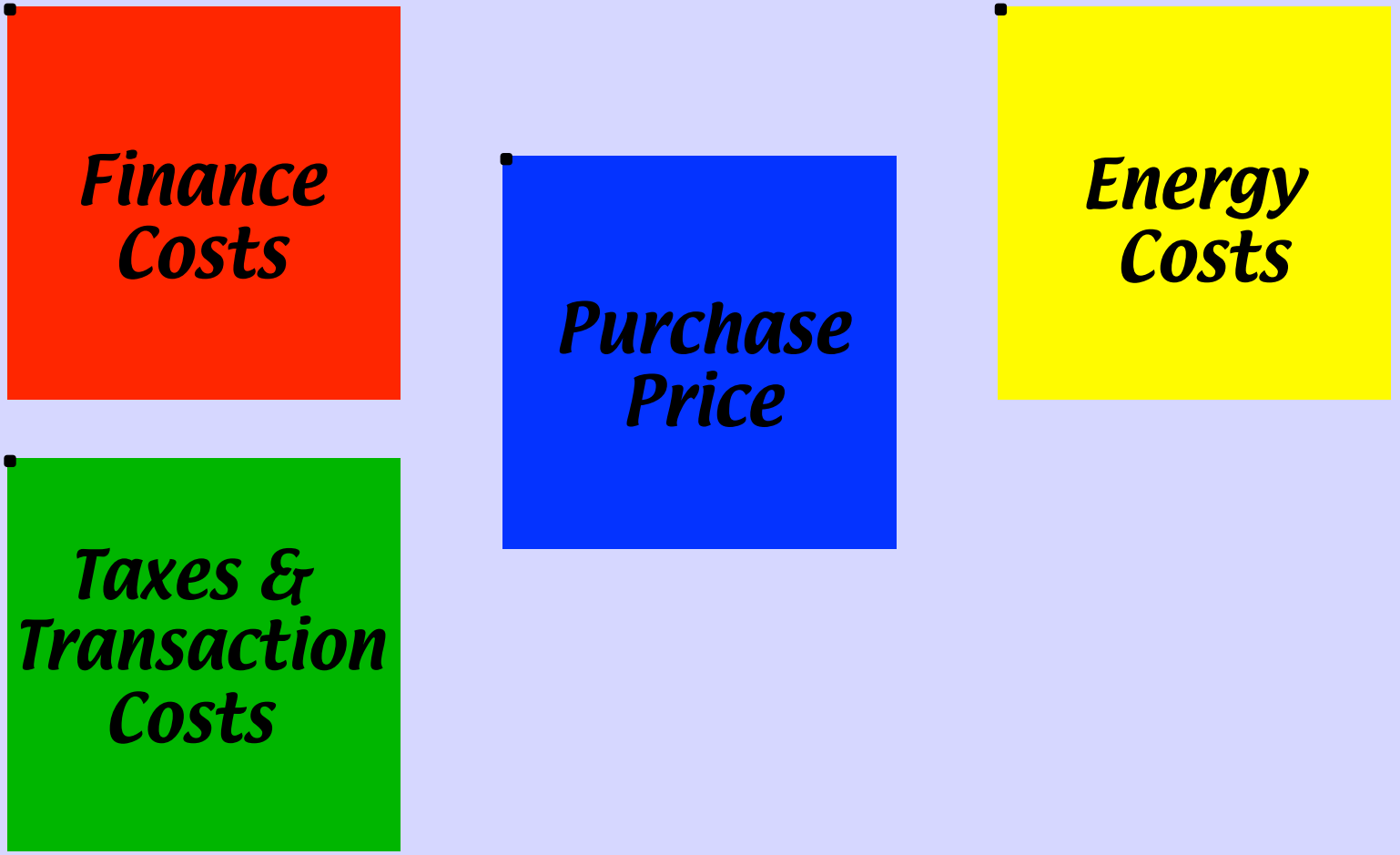
What ARE the Major Elements Of Housing Costs?

The Purchase Price is what we think of (and remember) as the cost of a home.

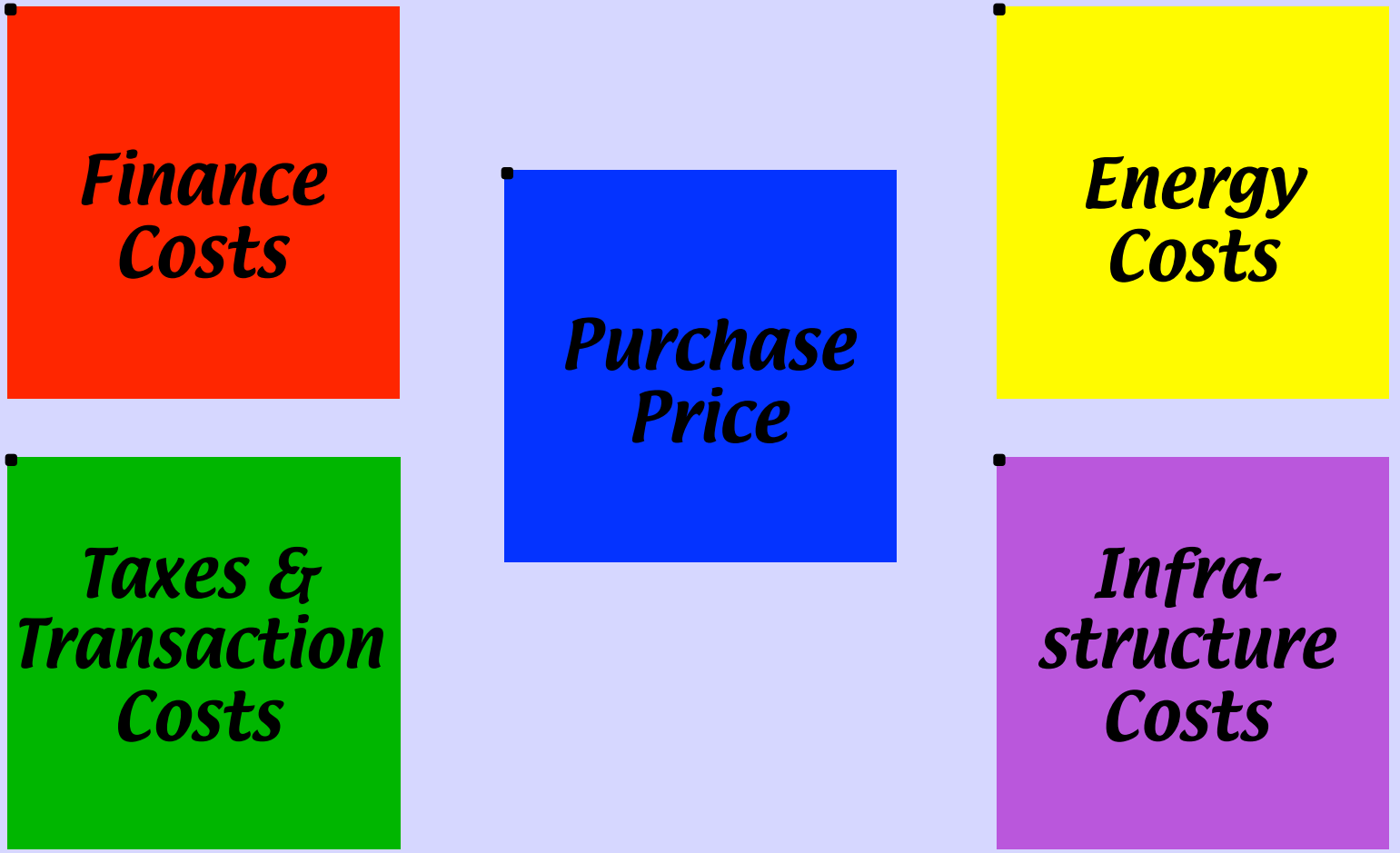
But the Finance Costs of a home can equal the Purchase Price over 30 years.

And the Energy Operating Cost of a home can easily exceed the Purchase Price.

Transaction Costs over a lifetime and taxes before paying <u>any</u> costs can again equal Purchase Price.



And Infrastructure Costs over a lifetime can more than equal Purchase Price.



INTERACTION of ALL these costs must be considered.

Purchase Price is less than a FIFTH of the total cost of a house!

Oh, and don't forget that
DURABILITY
is part of the cost equation!

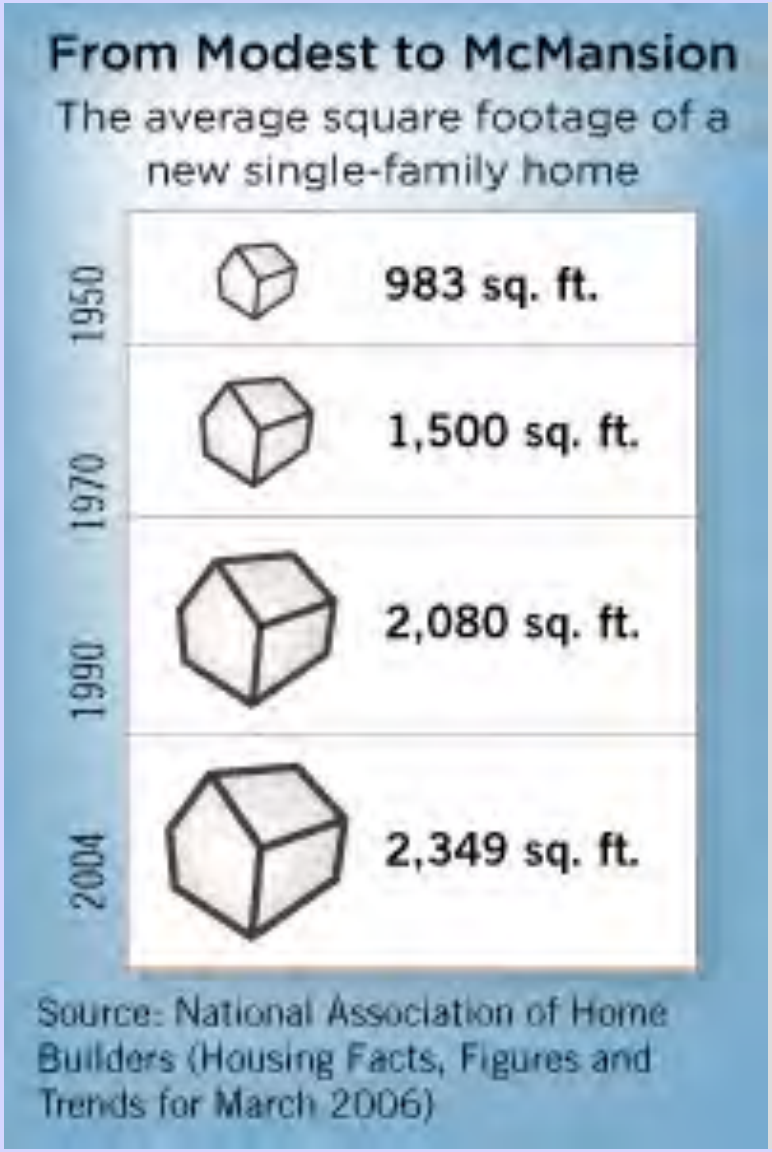
* *A house lasting 100 years*
costs only one-fifth as much per year
as one lasting 20 years
(a standard manufactured home).

Affordable housing minimizes
the TOTAL
Of all these housing costs.

Ways to LOWER construction costs:

- SMALLER SIZE
- BETTER DESIGN
- LESS SURFACE AREA - duplexing, 1-1/2 story
- REDUCE PROJECT COSTS -arch/eng, interest, permitting, etc.
- USE PLANBOOK OF GOOD ALREADY-DESIGNED HOMES
- SWEAT-EQUITY CONSTRUCTION
- GOOD-QUALITY MANUFACTURED HOMES
- AVOID CONSTRUCTION - USE EXISTING

What's the REAL cost of OVERSIZED homes?



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

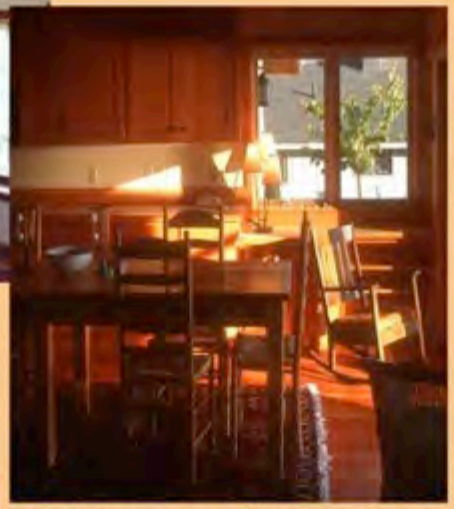
Total cost: $1,783,800

SMALL CAN BE GOOD!

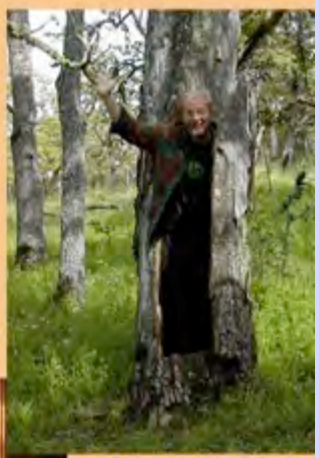
Floor living makes a small space become huge.

Good storage, and less "stuff" can eliminate costly square footage in a home.

Beds tucked into low spaces where you don't need the headroom can make a cozy but spacious bedroom.



A "ranch-kitchen" uses a table for food prep, eating, singing, and homework.



A "bedroom" with pillows can be a cozy and snug living room.

Tuck a bed into a window, instead of needing a whole room for it.

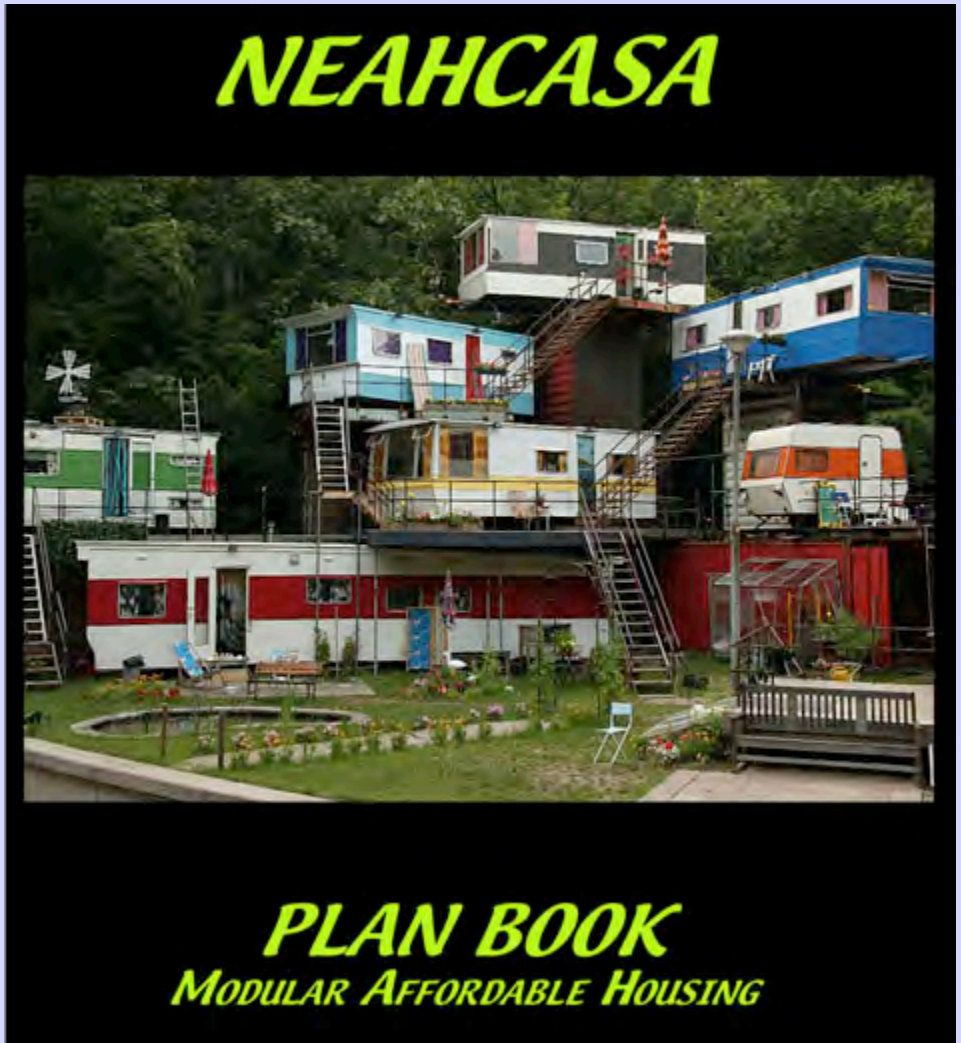
Yeah, I know! This really is just the elevator to the hobbit-home below.

Small homes don't have to be uncomfortable.

IKEA presents demonstration living spaces in their stores to show that we can live comfortably – not in 1200 square feet but in 590, or 375, or even 235 square feet!

Reduce PROJECT COSTS/design fees: The NEAHCASA PLANBOOK, for example, shows good modular designs tweaked for solar.

(But standard manufactured housing construction specifications aren't good.)



Ways to LOWER land costs:

- *CLTS, TRIBAL LANDS, BUSINESS LAND LEASES*
- *LAND BANKING*
- *VALUE CAPTURE OF UPZONING*
- *ADEQUATE LAND SUPPLY AT AFFORDABLE $*
- *INCLUSIONARY ZONING*
- *PUBLIC LANDS, FORECLOSURES*
- *INCREASED DENSITY - OVER PARKING, COMMERCIAL; DENSITY BONUSES, ETC.*
- *"FREE LAND" FROM ZONING SHIFTS, COMMUNITY LANDS, OTHER SOURCES*
- *MORE DENSITY, LESS PARKING*

Ways to LOWER space needs, and therefore costs:

- *GOOD DESIGN*
- *NOT-SO-BIG HOMES*
- *FLEX-HOUSING*
- *NEIGHBORHOOD GUEST-ROOMS*
- *MULTI-STORY, SHARED-WALLS (DUPLEXES, ETC.)*
- *CO-HOUSING*
- *HOME-SHARING*
- *SINGLE ROOM OCCUPANCIES*

Ways that DURABLE HOMES lower costs:

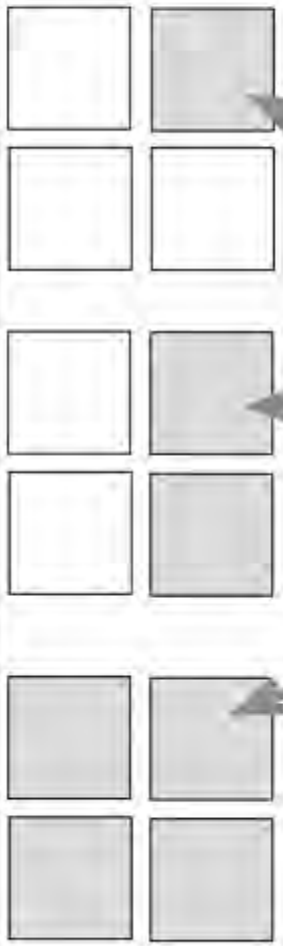
- *A house lasting two generations costs only half as much as one lasting a single generation (a 25-year manufactured home).*
- *A house lasting seven generations (175 years) reduces the capital cost of housing by 85%.*
- *Population growth requires adding new housing. Why should we support growth?*
- *Construction needed for durability (rust, rot, roof lifespan, moisture, etc.) costs only pennies in comparison.*

Ways to LOWER *finance* costs:

- SMALLER HOMES, 20-YEAR LOANS
- ENERGY SAVINGS ALSO PAY LOANS OFF FASTER
- CLTS (COMMUNITY LAND TRUSTS)
- FUNDING ONLY FOR PERMANENT AFFORDABILITY
- STARTER HOMES
- NO-INTEREST REVOLVING LOAN FUNDS
- HABITAT
- TAX-FREE MUNICIPAL BONDS
- TAX-CREDIT FINANCING
- "BARGAIN SALES" TO NONPROFITS
- LIFE-ESTATES
- LESS "CREDIT" BUYING, PAY LOANS FASTER
- EMPLOYEE HOUSING - Clallam School District

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.



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.

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

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 6 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 lease fees to 3% (equivalent to interest-free in 3% inflation US market).

Ways to LOWER energy costs to Net-Zero:

- VERY HIGH INSULATION LEVELS
- SOLAR WINDOW SIZING/ORIENTATION
- BETTER INSULATING WINDOWS
- LESS SURFACE AREA
- CONTROL LEAKAGE
- HEAT RECOVERY AIR EXCHANGE
- PASSIVHAUS DESIGN PROCESS
- DEEP-ENERGY RETROFITS
- EFFICIENT APPLIANCES/LED LIGHTS
- HEAT-PUMP OR SOLAR HOT WATER
- ROOFTOP SOLAR-ELECTRIC PV PANELS
- AWARE OCCUPANTS

SAVE ENERGY, SAVE MONEY!

LOW-TECH RENEWABLE ENERGY HEATING SYSTEMS CAN WARM THE HEART AS WELL AS THE HOME.

SOUTH WINDOWS, WITH TILE FLOORS, CAN BE AN INEXPENSIVE WAY TO HEAT A HOME.

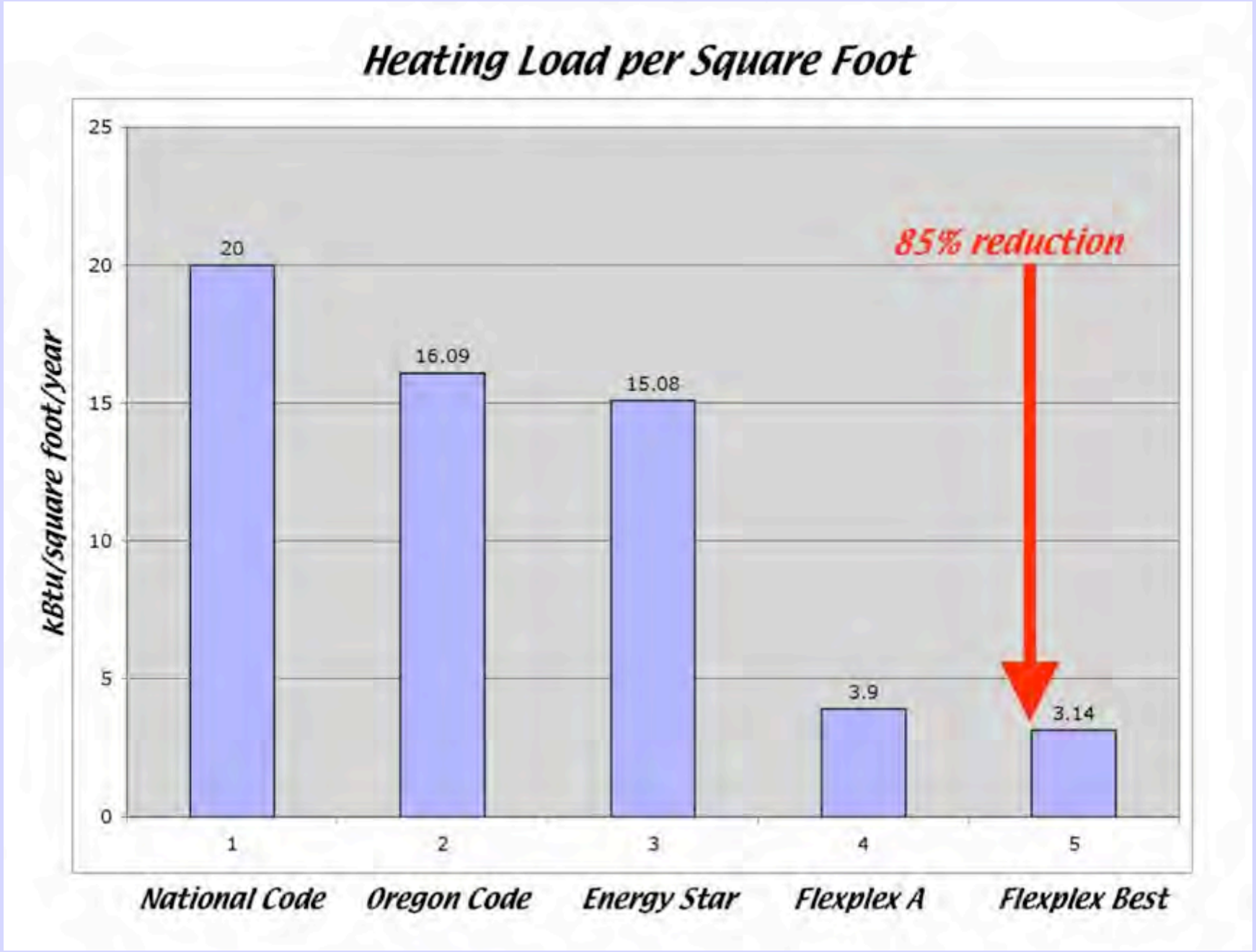
COMPACT, HALF THE SQUARE FOOTAGE, 1-1/2 STORY, SUPER-INSULATED DESIGN REDUCES HEATING LOADS BY 80%

ROOFTOP SOLAR WATER HEATERS AND SOLAR ELECTRIC PANELS CAN REPLACE REMAINING OUTSIDE POWER NEEDS.

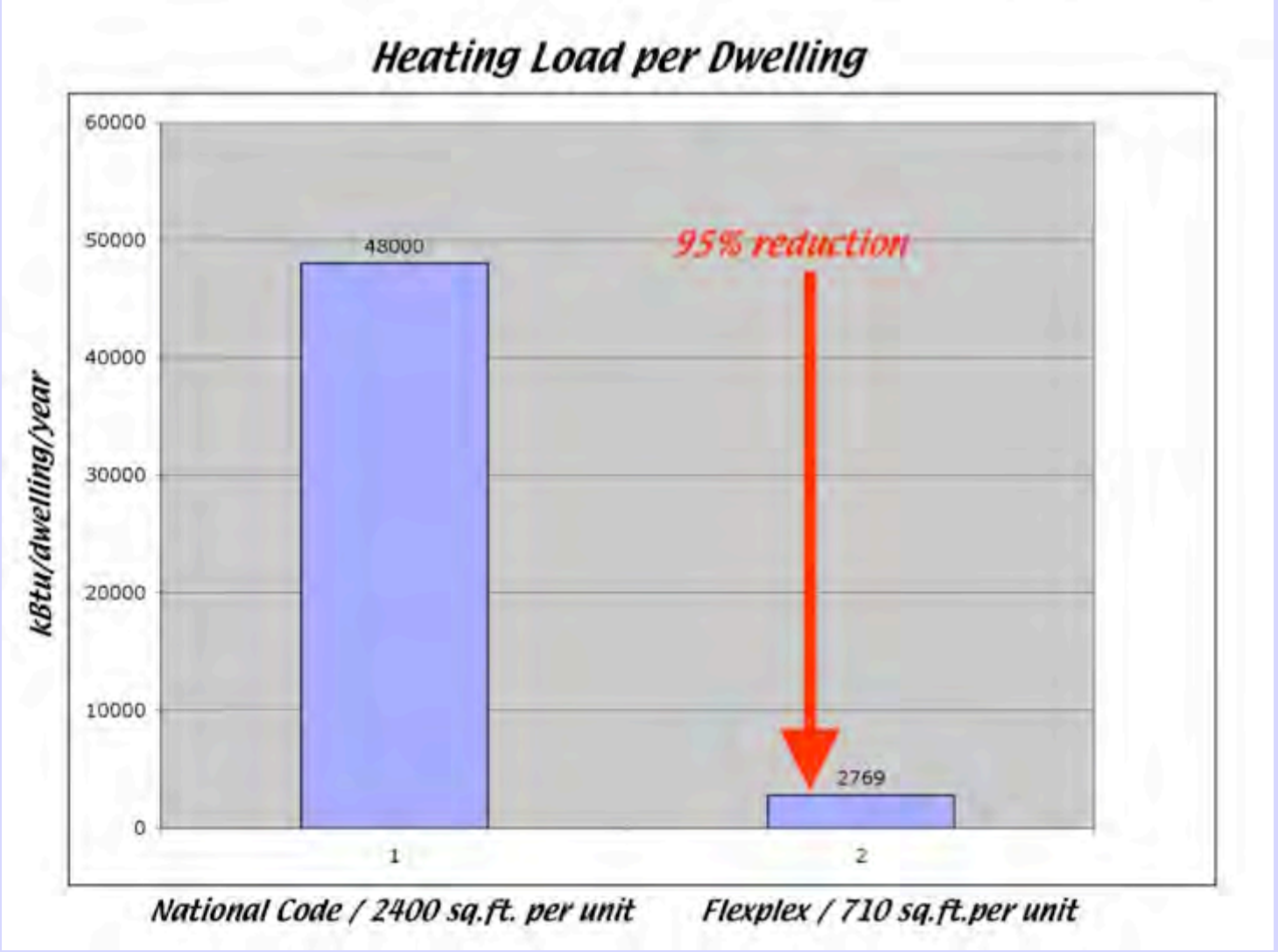
A "COOL-BOX" RATHER THAN A REFRIGERATOR IS SILENT AND USES NO ENERGY.

WISE APPLIANCES SAVE IN MANY WAYS. HERE A CORNER TANK DUAL-FLUSH TOILET WITH HANDWASHING SINK IN THE LID.

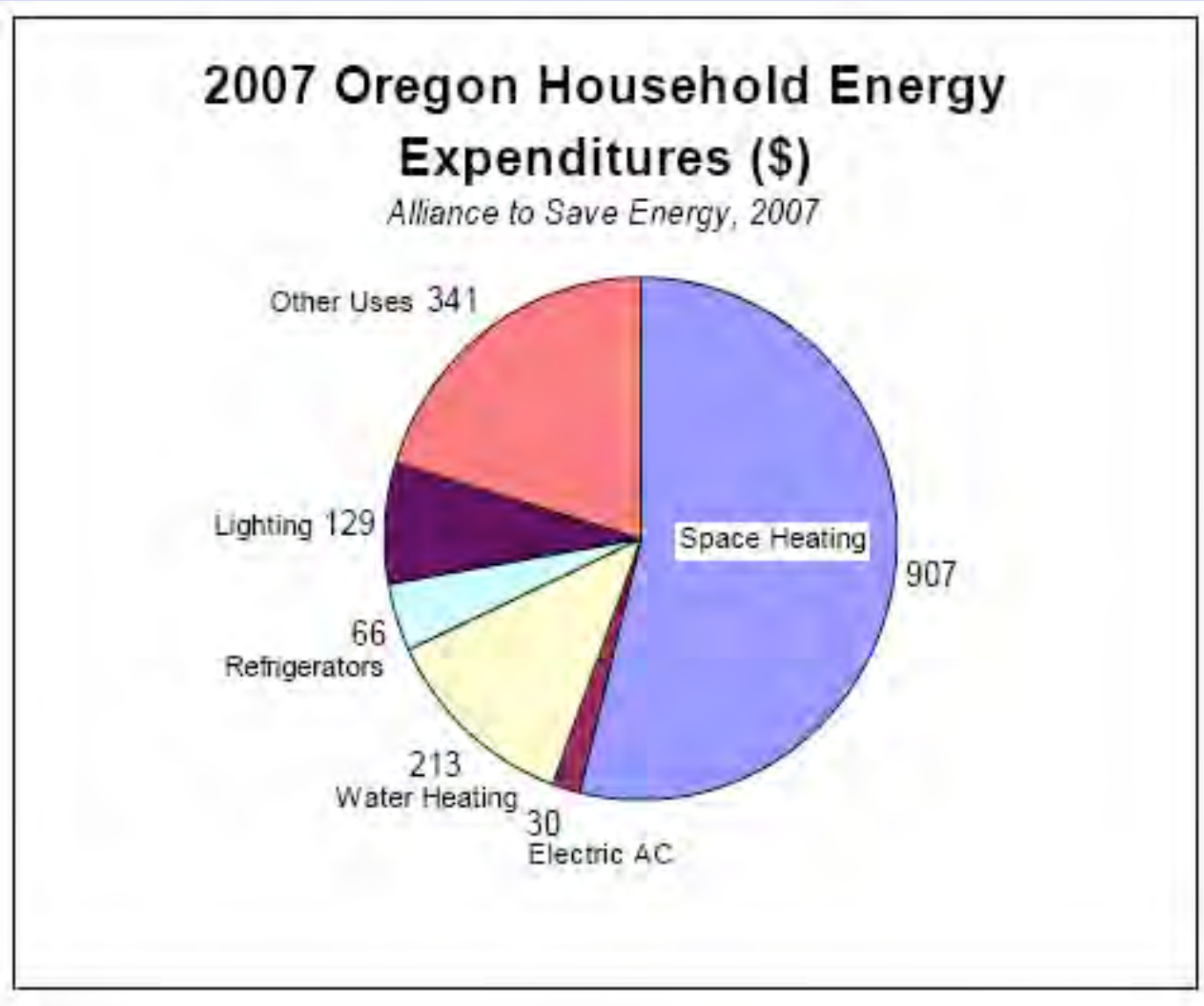
REPLACE A NORMAL REFRIGERATOR WITH A COOL BOX AND A COMPACT ENERGY-STAR UNDERCOUNTER FREEZER, (BELOW) AND REDUCE REFRIGERATION ENERGY USE BY 80%


Heating Load per Square Foot
kBtu/square foot/year
25
20
15
10
5
0
20
16.09
15.08
3.9
3.14
85% reduction
1
2
3
4
5
National Code
Oregon Code
Energy Star
Flexplex A
Flexplex Best

A SMALLER WELL-DESIGNED HOME MEANS LESS WASTED SPACE, LESS COST, LESS ENERGY USE

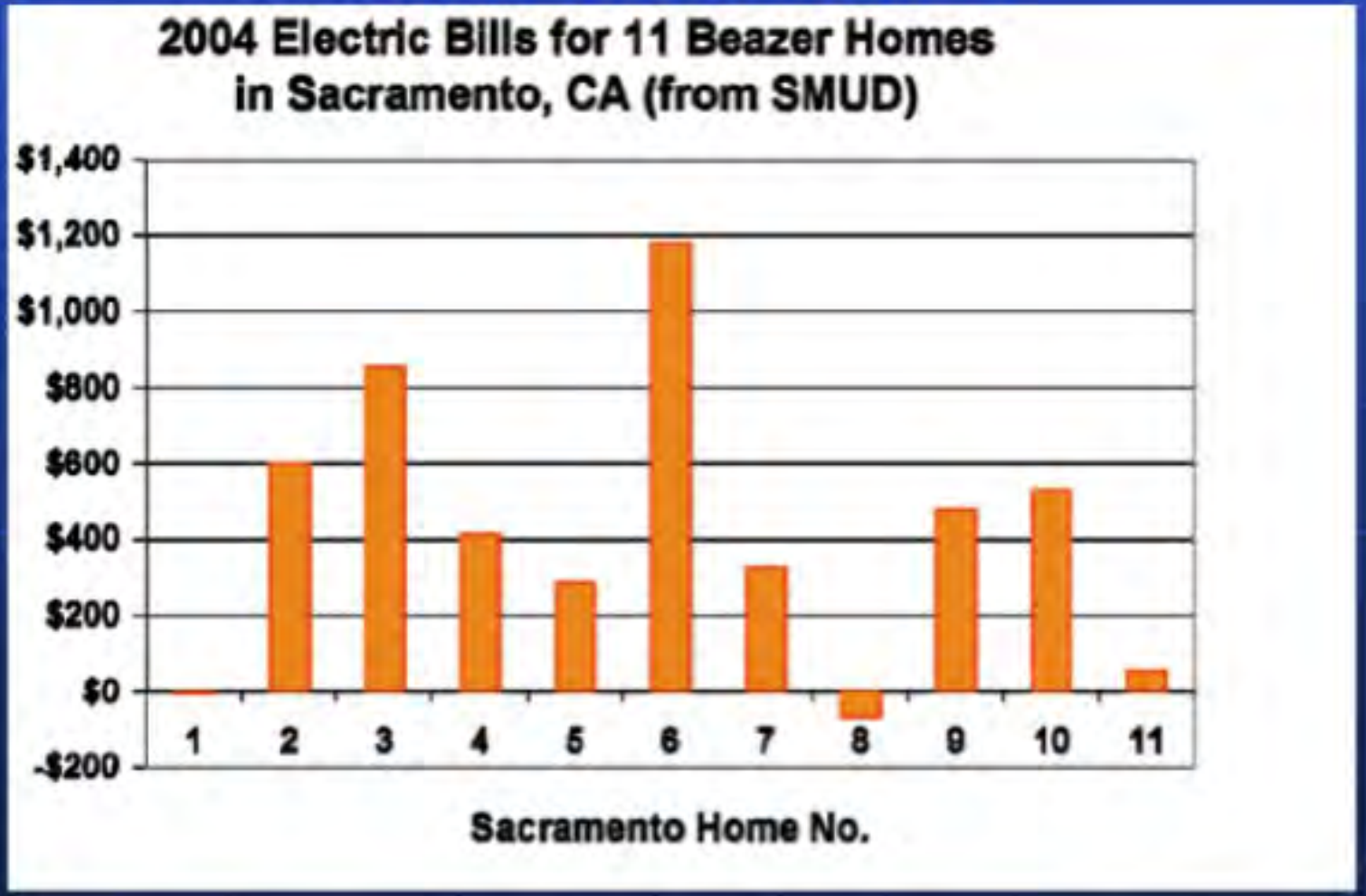


OCCUPANT ENERGY IS HALF OF NORMAL HOME ENERGY USE



Occupants Matter!

Variation in measured energy use in IDENTICAL homes:



Ways to LOWER occupant energy use:

- *Solar or heat-pump water heaters can reduce hot water energy use by 75%*
- *LED lighting can reduce lighting loads by 90%*
- *High-speed spin washers and clotheslines can reduce dryer energy use by 50%*
- *Cool Boxes and Energy Star refrigeration can reduce refrigeration energy use by 50%*
- *Efficient electronics, kitchen and other plugloads can reduce 50%*

Public Policies can LOWER <u>energy</u> costs:

- *Require Net-Zero-Energy in new homes*
- *Tax incentives for renewable energy and efficiency*
- *Require energy upgrades of existing homes when sold*
- *Efficiency is far cheaper than ANY energy purchases*
- *Renewables cost far less than military costs of fossil fuels*

Ways to LOWER transaction costs:

HOUSES CHANGE OWNERSHIP EVERY 7 YEARS

EACH TRANSACTION USUALLY INVOLVES

- REALTOR FEES
- TITLE INSURANCE AND CLOSING FEES
- MORTGAGE SETUP COSTS
- MOVING COSTS
- REDECORATING COSTS
- OTHER TAXES AND FEES

THIS CAN ADD UP TO 8%-10% OF THE COST OF THE HOUSE EVERY 7 YEARS, OR 60% OF BASE COST OVER A LIFETIME

- FLEXPLEXES, H.C. BATHROOMS, LESSEN MOVING NEEDS.
- NONPROFIT HOUSING EXCHANGES LESSEN REALTOR FEES.
- TRANSFERABLE MORTGAGES LESSEN COSTS.

Ways to LOWER property tax costs:

AT 1% OF VALUE, PROPERTY TAXES EQUAL 50% OF HOME VALUATION OVER 50 YEARS

- *LOW-INCOME TAX EXEMPTIONS*
- *INCLUDE "INTANGIBLE" PROPERTY TO SHIFT TAX LOAD*
- *HOMESTEAD/RENTSTEAD TAX EXEMPTIONS*
- *SMALLER HOMES*
- *LAND OWNERSHIP BY A NON-PROFIT ORGANIZATION*
- *HOUSING SURPLUS LOWERS VALUATION, THUS TAXES*

Ways to LOWER income tax impacts on housing costs:

INCOME TAXES ARE A "20%" INCOME "COST" BEFORE SPENDING REMAINING INCOME ON HOUSING

- *USE SWEAT-EQUITY CONSTRUCTION OR REMODEL*
- *WORK OUTSIDE OF TAX ECONOMY*
- *REMEMBER TO USE MORTGAGE TAX DEDUCTIONS*
- *DEDUCT HOME EXPENDITURES AS BUSINESS EXPENSES WHERE POSSIBLE*

Ways to LOWER infrastructure costs of housing:

1. USE EXISTING INFRASTRUCTURE MORE WISELY AND INTENSELY.

- *STREETS*: Elimination of streets is a valuable but case-specific strategy, dependent on underground utility locations, etc. Removal of a single block of cross-street gives two 50' lots, room for four dwellings, and with common corner setbacks, room for pedestrian and bike paths. It replaces street maintenance costs with tax income from lots. Existing blacktop can be remixed, concrete crushed for reuse as gravel.

- *UTILITIES*: Deep energy retrofits of existing homes can reduce energy, sewer, and water use by 80%. Accessory dwelling units, or duplexing, can double number of housing units per existing lot. Together, these can reduce utility operating costs, eliminate upgrade/expansion needs, increase maintenance funding for existing infrastructure.

2. GET OUR COMMUNITIES OUT OF "DEBT TRAPS".

3. IMPLEMENT HONEST, SUSTAINABLE, FULL-COST LIFECYCLE COSTING FOR ALL URBAN SERVICES.

4. STOP GROWTH.

5. USE EXISTING INFRASTRUCTURE MORE WISELY AND INTENSELY.

6. MAKE OUR INNER CITIES SAFE AND HEART-Y.

7. TRANSFORM SUBURBIA.

8. LOCALIZE AND SUBSTAINABLIZE FOOD, HEALTH, TRANSPORTATION, HOUSING, EDUCATION, ETC.

9. BAN UNFUNDED MANDATES.

See "Strongtowns.org" and my "Getting Our Cities Out of Bankrupcy" for hot-linked details.

Ways to LOWER transportation costs of housing:

- *Cost of land needed for parking, roads.*
- *Construction costs of garages, parking.*
- *Time, energy, and financial costs of commuting.*
- *Insurance, ownership and operating costs of a single car can cost $250,000 over 50 years.*

Car-share, walkable densities, transit, mixed zoning can reduce these costs.

CarShare LOWERS transportation costs of housing:

SPACE COSTS. *In many communities, parking requirements are the single greatest barrier to the construction of affordable housing. Each residential parking space entails a cost of $25,000. Including car-sharing as part of new housing can reduce the amount of parking that has to be provided, thereby bringing down the cost of housing.*

REDUCED TRANSPORTATION EXPENDITURES. *A compact automobile costs $5,000 per year, for depreciation, insurance, taxes and finance charges. The average CarShare member, in contrast, spends $540 and drives 435 miles per year. Car-sharing allows people to make necessary car trips such as taking a child to the doctor or interviewing for a job, without the burden of car payments, insurance, parking, and other and associated costs. Money saved from transportation costs can go to housing.*

LESS LAND NEEDED FOR PARKING. *Each car-sharing vehicle replaces as many as seven private cars. This means that car-sharing can be a cost-effective alternative to building more parking garages, often costing $30,000-$50,000 per space in urban areas.*

Resources:

http://www.carsharing.net

II. EXISTING HOMES - OUR MOST VALUABLE RESOURCE?

- They are FREE - "already paid for" economically.
- Their prices are heavily impacted by surplus vs shortage - growth/demand shifts.
- Many are oversized - "splits" can create "free" homes.
- Deep-Energy Retrofits can reduce energy use 80%.
- Houses to be demolished can be relocated.
- ADUs can create "flex-housing" so people can stay longer in their neighborhoods.

The 1970s 3-bedroom ranch house is our greatest source of potential affordable housing AND "negawatts".

GETTING ADDITIONAL "FREE HOMES" FROM EXISTING ONES

"Accessory Dwelling Units" are a bureaucratic mechanism to create an affordable additional dwelling - usually a portion of an existing single-family residence - while avoiding some of the costly requirements of Building Codes.

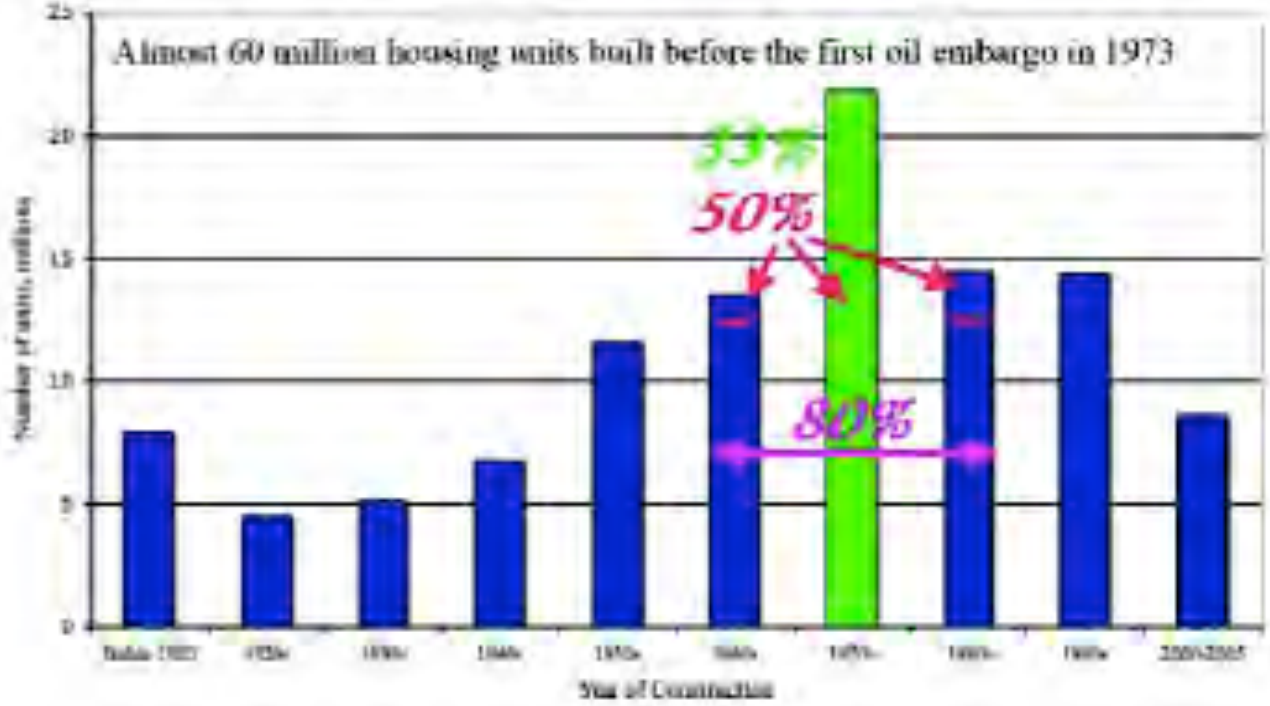
An A.D.U. is defined as <u>NOT</u> being a separate dwelling unit.

This avoids costs of being a "duplex", such as separating water service, electric panels, fire separations, heating, utility connection fees, etc.

A.D.U.s are such a good deal . . .

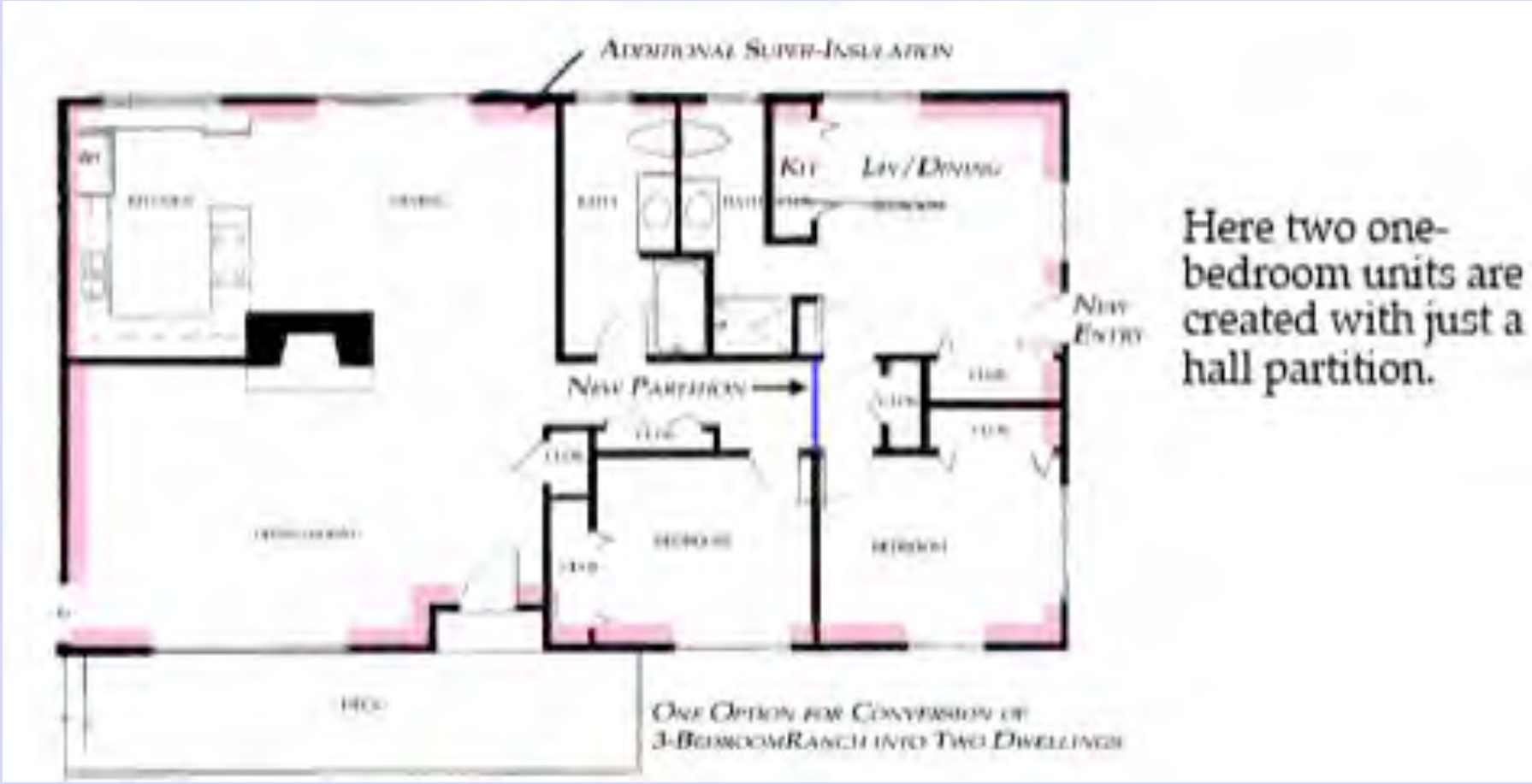
Because a LOT of our housing is easily converted.

Creating smaller homes from our existing ones is easy!



Probably a third of our housing stock is 3-bedroom ranch houses. They are easy to retrofit for net-zero-energy, and can easily be partitioned into a duplex.

SPLITTING THEM uses <u>what's already there</u> - totally avoiding the cost of new construction.



Energy retrofits, and "green glue" sound/fire separation upgrades are easy and affordable.
And opening one door gives a big home again when needed!

A.D.U. HOMEOWNER BENEFITS:

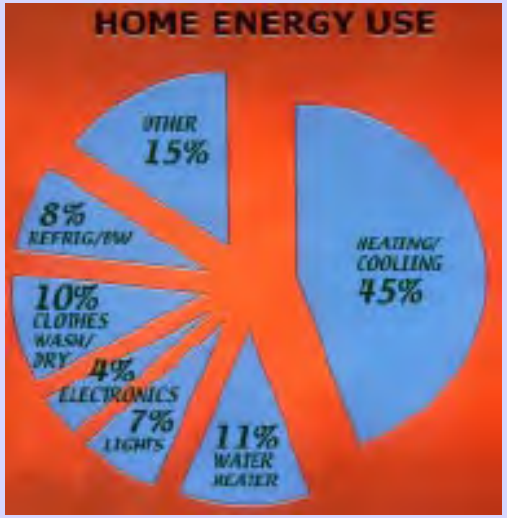
- *Care and support of elderly residents.*
- *Income allows people to remain in their neighborhood longer, meet rising costs.*
- *Increased security and companionship.*
- *Helps first-time homeowners meet payments, qualify for mortgages.*
- *Easy "oversight" of rental property.*
- *Ability to make best use of existing home after children grow up.*

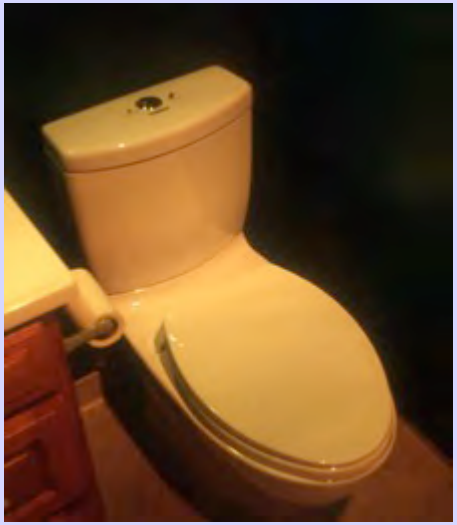
A.D.U. COMMUNITY BENEFITS:

- *Very affordable housing without government subsidies.*
- *More efficient use of existing housing and infrastructure.*
- *More density to support transit, neighborhood stores.*
- *Income for homeowners.*
- *Better maintenance and neighborhood stability.*
- *More housing opportunities within existing communities.*
- *Energy and resource efficiency.*
- *Major reduction in city's infrastructure costs per dwelling.*

Energy upgrades are easy on existing homes:

- *More insulation*
- *New windows*
- *Stop air leakage*
- *Reduce water use*
- *Wood heat*
- *Passive solar*
- *Solar/HP hot water*
- *Efficient lighting*
- *Clothes washing and drying*





DEEP ENERGY RETROFITS:

We can obtain ALL our "new energy needs" through efficiency upgrades - at <u>half</u> the cost of ANY new energy source.

AFFORDABLE COMFORT.org shows from demonstration projects across the country that deep energy upgrades of existing homes can cut their energy use by 80%:

- ***New England timber-frame***
- ***New Mexico adobe***
- ***Alaskan stick-built***
- ***Montana super-insulated***

1+1 = 3

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 with very little investment.
- **Capacity for electric vehicle transportation** within our renewable hydro-based electrical allotment.

And don't forget

FREE HOMES!

RELOCATING HOMES THAT WOULD OTHERWISE BE DEMOLISHED CAN GIVE HOMES AT A FRACTION OF THE COST

Here, cabins to be bulldozed to build condos almost became starter homes that could be moved from site to site.

III. ALL HOMES NEED TO HAVE SOULS

Conventional economics believes that

LOVE

is

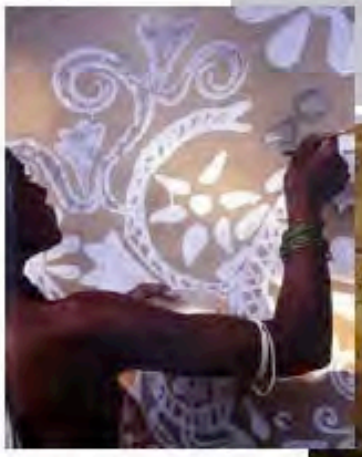
worthless

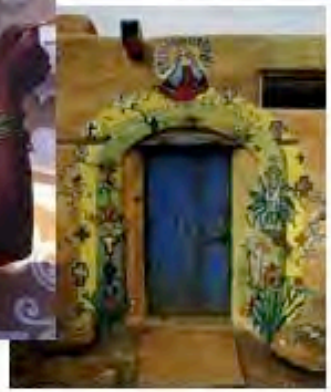
So . . . it's time for a different economics!

Bill and Athena Steen's "Houses that Sing" project showed the wonderful potential of owner-built clay plaster and ornament.

We want homes, for our community, that have hearts.

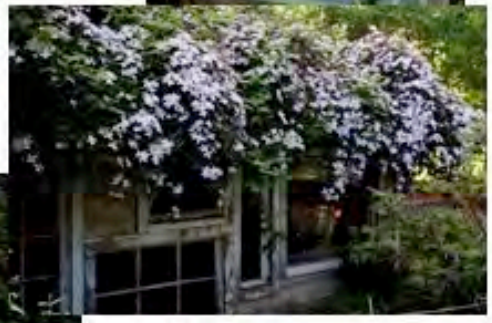
Putting love into a home doesn't require money, only opportunity and intention.



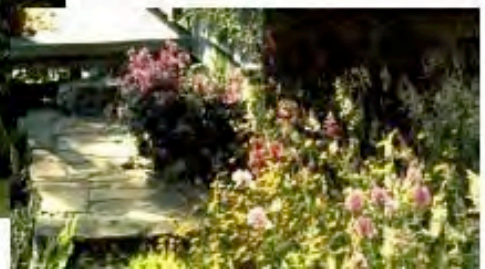


Simple hand-painted designs can add a personal touch.

Native plant landscaping can grow a wonderful connection to the world around us and snuggle our homes into it.



Humor in our homes? What a concept!



HEART

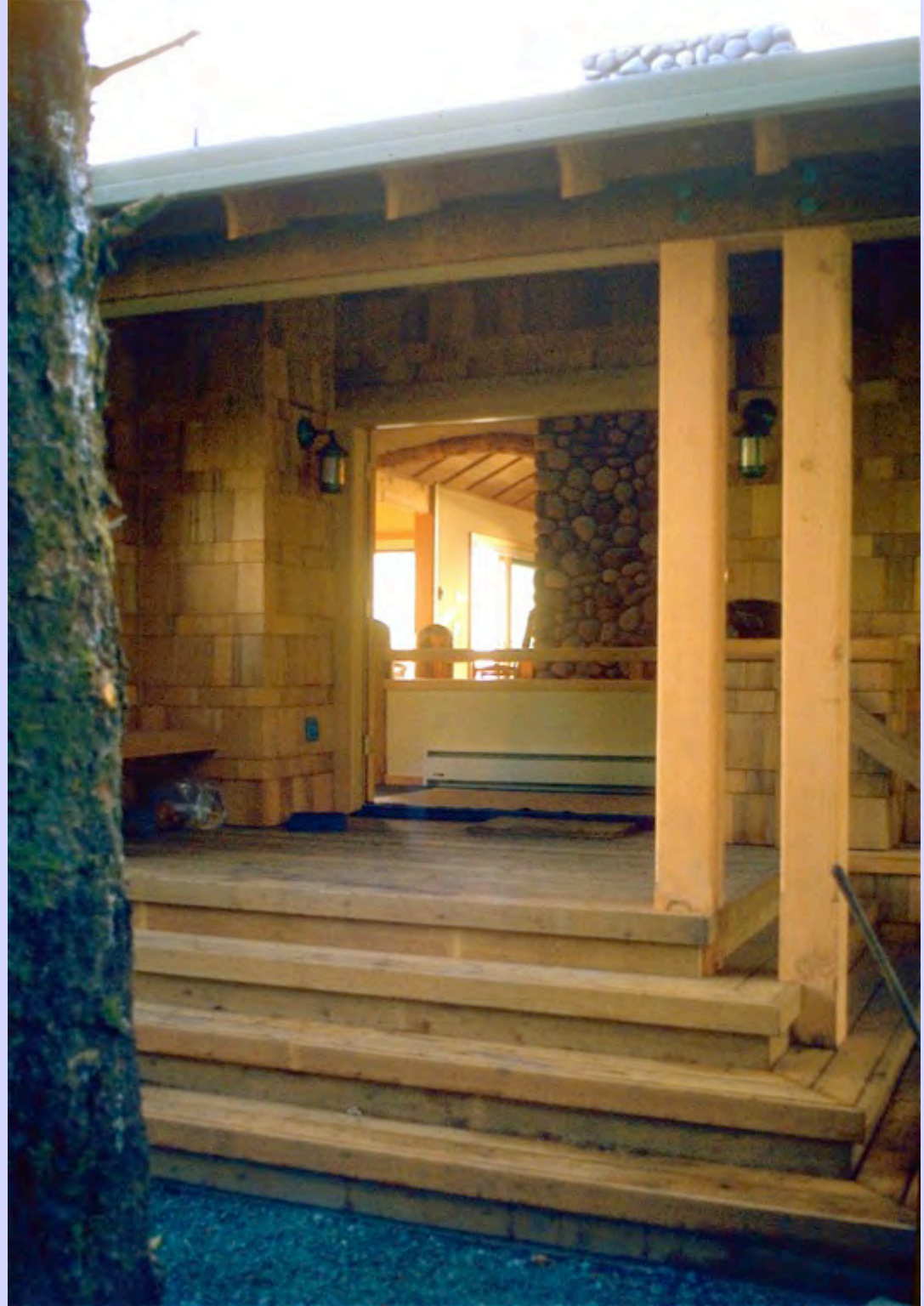
doesn't cost money!


MAGIC CAN
BE ADDED
TO A HOME
IN MANY WAYS!

WELCOME

radiates
from places
with a soul -

offering
sanctuary,
respite, and
nurture.



OUR SOULS NEED HOMES

as much as our bodies.

Homes for spirits don' t need walls or roofs.

CONNECTION

Connection

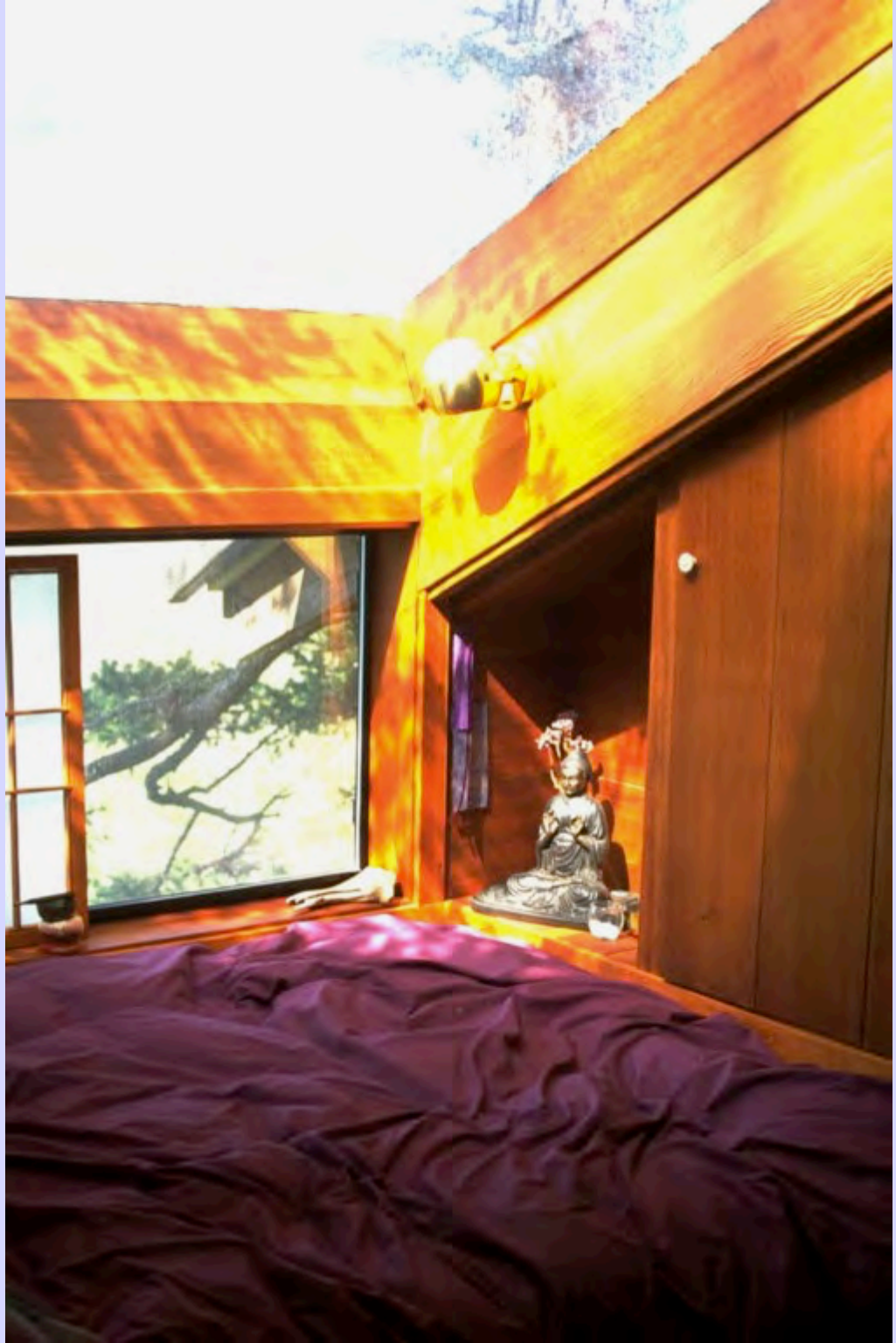
Connection

With the circling of the
sun and moon.

With the rhythms of
the day and season.

With the darkness
which shows us
the stars.

Without it,
we feel
emptiness.



OPENING

to outdoor spaces
from every living area
also opens our hearts.

ALIVENESS!

Leaf shadows
dance in sunlight
on the floor.

Sun-rippled water
reflects on the
ceiling.

Sounds
of water and birds
through
open windows.

The richness and joy
of life dancing
with life
can fill our places.

SILENCE

The invisible joy
of the silence

of the absence

of motors
of refrigerators
and dishwashers,

and furnaces,
and washing machines,
and televisions!

Our cool-box has saved us $$$$ in cost of refrigerators and electricity over 37 years!

An
outside-vented cool-box.

MIRRORS
distort.

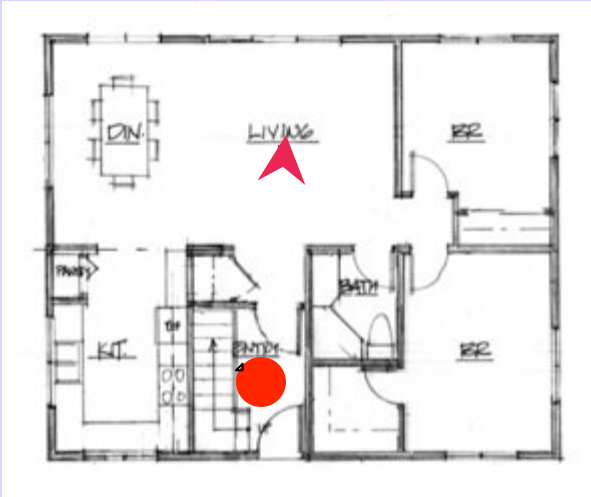
They focus attention
on outer
appearance
rather than
inner nature,

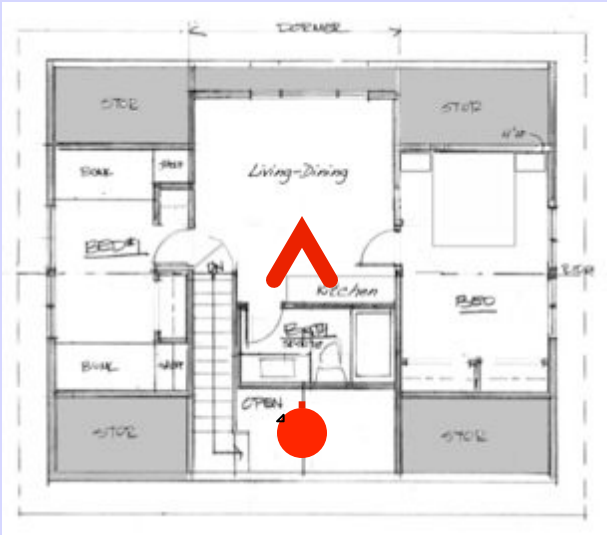
diminishing
our self-esteem

every rumpled
morning.

Even small things
change the energy
of a home
and our lives.

IV. WHAT CAN "FLEX-HOUSING" DO?





By giving <u>direct</u> access from an entry to the upstairs, downstairs, PLUS one bedroom, a flex-house can allow a duplex, a home occupation, an accessory dwelling unit, a neighborhood guest room, or a single up-and-down multi-generational "big-house". Being adaptable, it reduces needs to move, and the associated costs.

Why pay the real cost of two empty bedrooms

once the kids are grown?

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

The space is there,
why not make better use of it?

Create a Neigborhood Guest-Bedroom - $$ in, not out.
Avoid transition costs of moving.

Here is a

Flex-House conversion -

from a 3-bedroom ranch house to multiple occupancy.

Flex-Housing allows changeable living and working patterns:

TRIPLEX:
The configuration of this existing house, with attached garage and full daylight basement, lent itself also to a tri-plex arrangement, with two 3-bedroom and one 1-bedroom totally separate units.

WORKPLEX:
Or, configured as a 3-bedroom upper and 1-bedroom lower unit leaves four rooms (purple) that can be used as work-space or shared guest space for the occupants of the house.

FACTORY-BUILT housing CAN work -

IF YOU:

- Ensure living wages
- Avoid $90/hr on-site work
- Use energy-efficient specs
- Use durability specs
- Get quantity purchases
- Minimize delivery costs

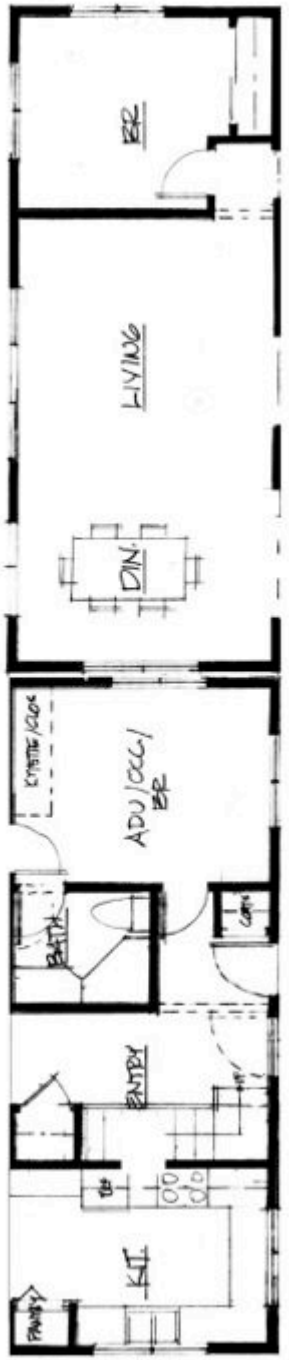
HERE IS A FLEX-PLEX MANUFACTURED HOME DESIGN THAT WORKS:

Northwest view of '70s prototype, with storm-sheltered entry, woodshed, and cool-box.

South side - passive solar, low sun angle in winter fills interior.

MODULAR UNITS (ABOVE) ↑

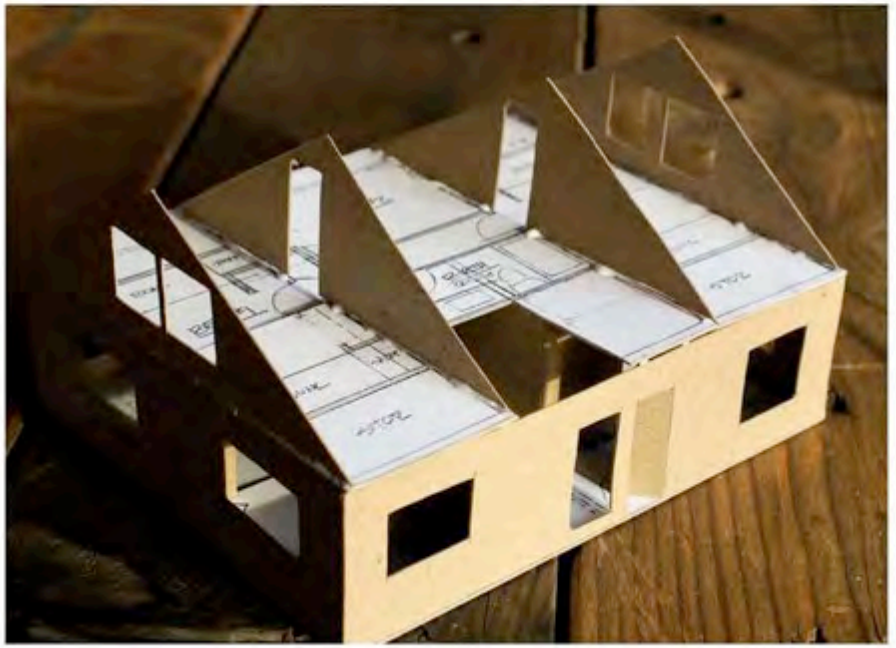
TRANSPORT CONFIGURATION (RIGHT) →



Flexplex is designed for single trailer delivery of entire house, and single day on-site assembly and weathering-in.

The two units are assembled on a single frame, then cut apart on site after delivery.

Modules ready for shipping, above, with SIP roof panels, ridge beam, and gables on top. Assembled on site, with gable walls in place, below.

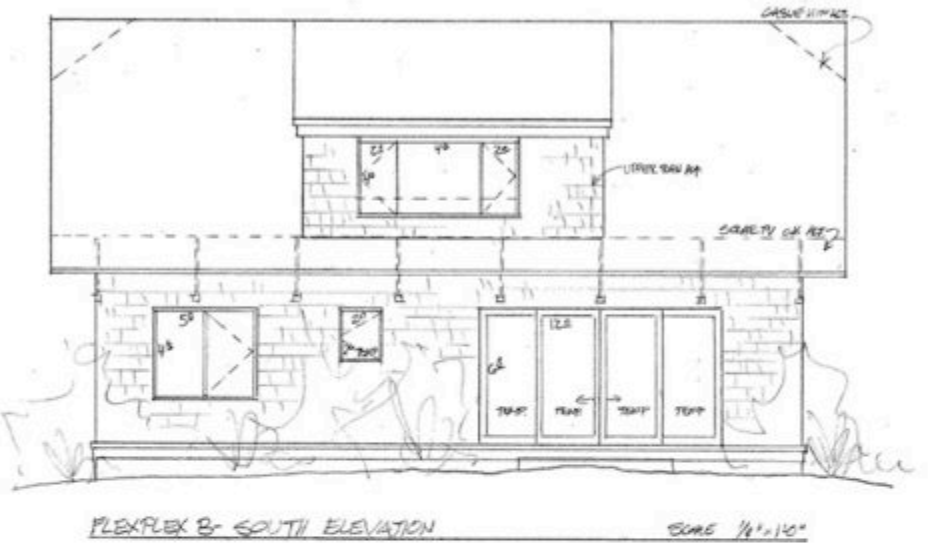


Roof panels are crane installed on site, with insulated, finished ceiling. Panelization allows normal roof overhangs not usually possible with factory modules.

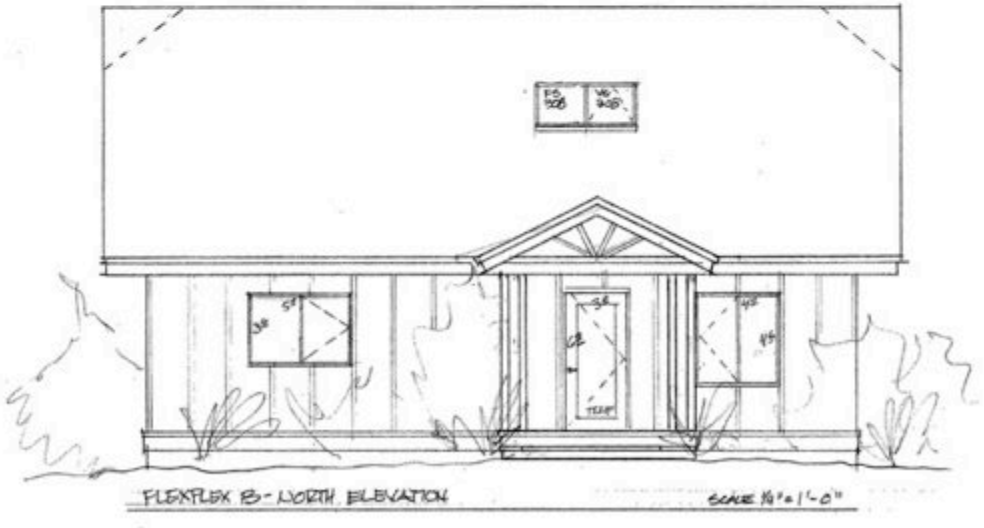
Upstairs floor is already installed and plumbed. Finish of upper level can be by owner or before move-in.

Finish options, here over a basement garage/storage, for a sloped site.

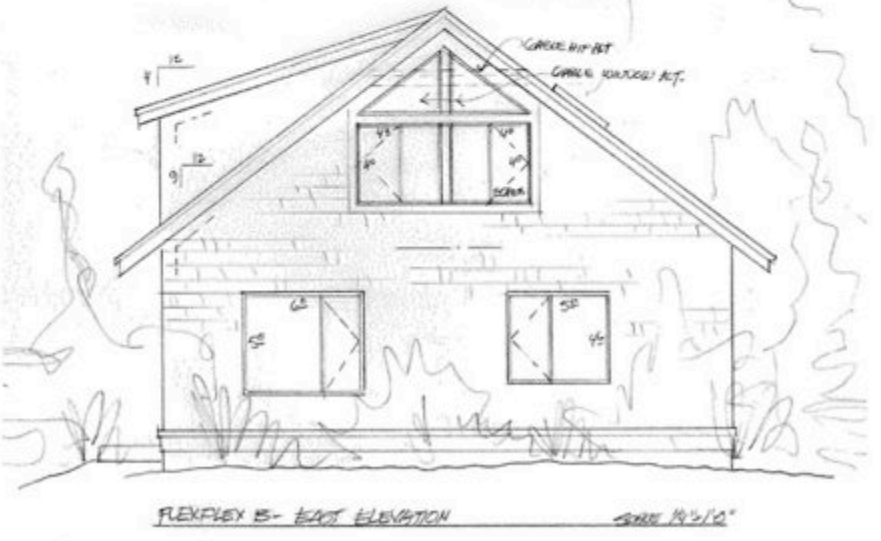
FLEXPLEX B - WEST ELEVATION - DAYLIGHT BASEMENT OPTION



FLEXPLEX B- SOUTH ELEVATION

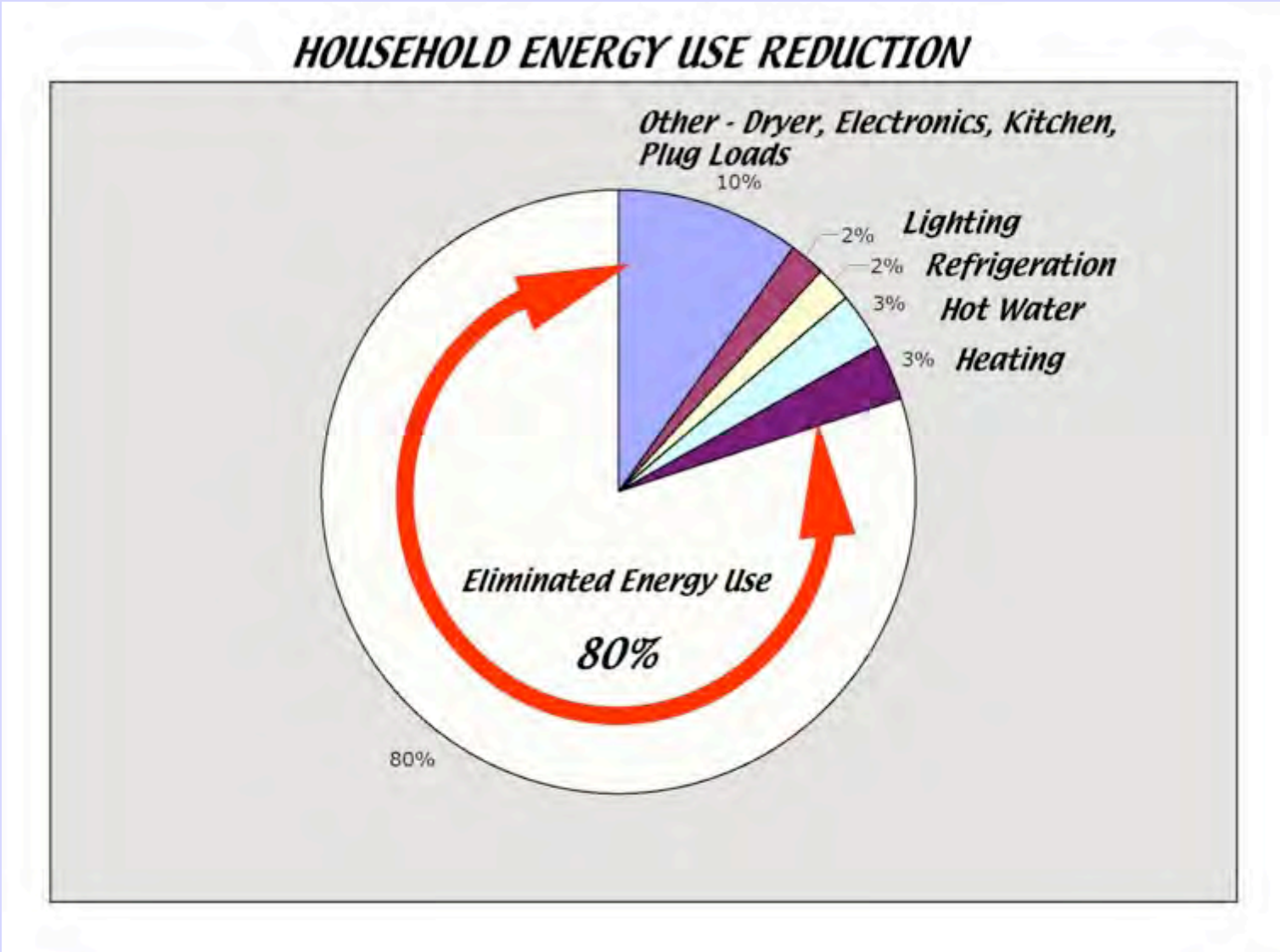


FLEXPLEX B - NORTH ELEVATION

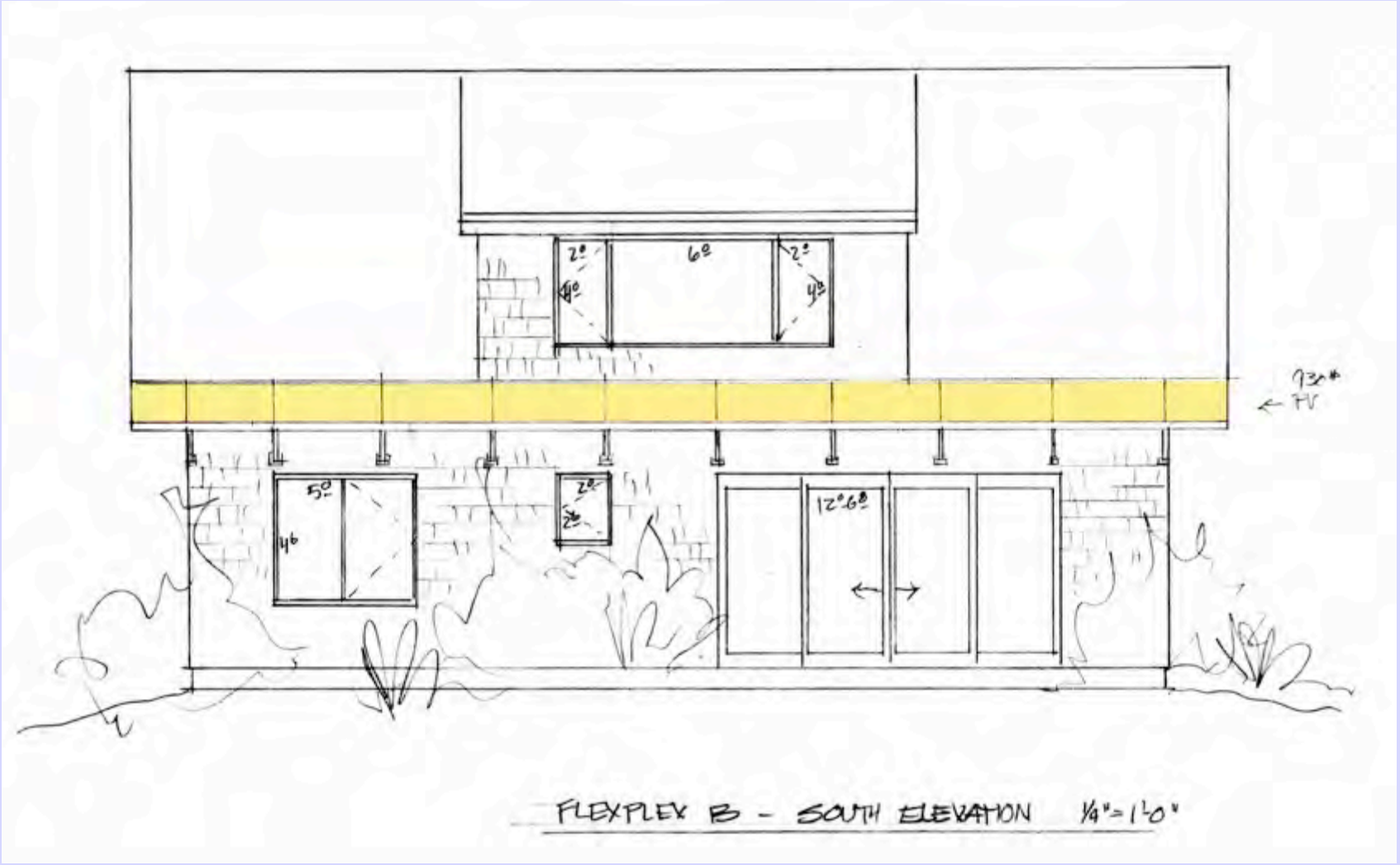


FLEXPLEX B- EAST ELEVATION

OVERALL FLEXPLEX ENERGY USE REDUCTION:



SOLAR PV INSTALLATION
INSTEAD OF ROOF OVERHANG
ON THE SOUTH SIDE OF A FLEXPLEX



V. SOME BENEFITS OF HOUSING TRUSTS

- Stop inflation of land
- Public investment keeps growing
- Local/resident/community control
- Cut transaction costs
- Reduce or eliminate finance costs
- Share equity, keep homes permanently affordable
- Give full bundle of ownership rights
- Manage local investment
- Encourage energy-efficient green design.

Housing Trust
home ownership can:

- **Stop inflation/market increases in BOTH land and housing prices on trust-owned land and housing.** *At our historic 3% inflation rate, prices double in 20 years. Therefore trust ownership can, in effect, cut the entire effective land/building costs of existing CLT homes in half in 20 years.*

- **Eliminate (in 20 years) the finance component of trust-owned land and housing costs.** *PAYING OFF equals a reduction in housing costs - in perpetuity - equal to the entire capital cost, where a trust owns structures.*

- **Eliminate cumulative transfer costs on trust-owned land and housing.** *Where both house and land are trust-owned, this would amount to 50%of the purchase cost of a conventional house over a lifetime.*

- *Thus in 20 years, it's possible to reduce the lifetime market costs of homes:*
  * *50% through elimination of finance costs,*
  * *50% reduction through escaping market inflation, and*
  * *another 60% through avoidance of transfer costs.*

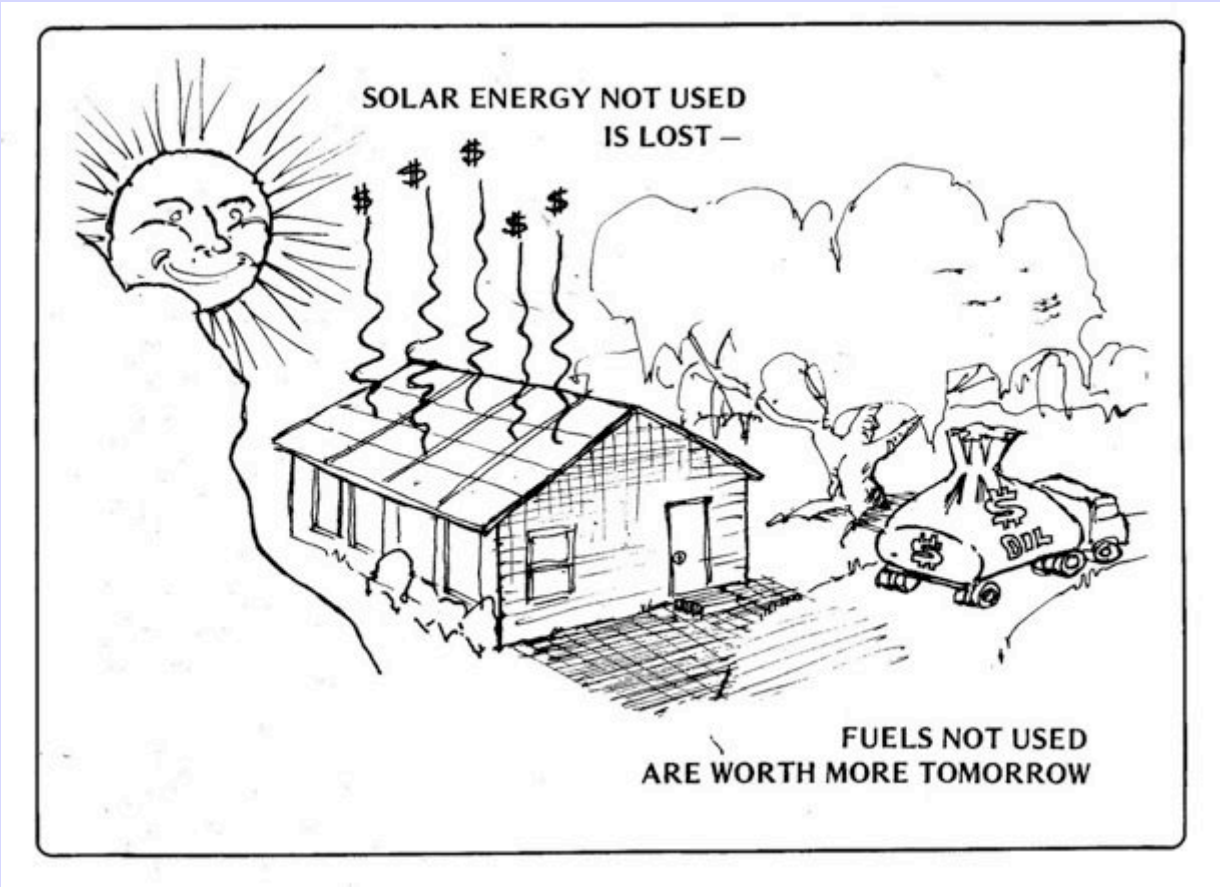
This option alone results in 90% reduction in capital/finance costs!

ENDGAME ANALYSIS

It's always important to compare the ENDGAME results of different options:

Consider natural gas vs. home insulation as an energy resource. Both might cost the same over a twenty year period and maybe equivalent environmental effects.

Yet at the end of the twenty years, the gas alternative ends with NO insulation, NO fuel, and a furnace needing replacement; while the insulation alternative is IN PLACE, ready to continue "supplying energy" for twenty to a hundred more years, PLUS still having the original fuel reserves for our benefit.



ENDGAME: The financial cost may have been the same, but the endgame position is TOTALLY different.

VI. EASY CHANGES

HOUSING IS JUST ONE EXAMPLE
OF THE MANY OPPORTUNITIES
IN ALL PARTS OF OUR LIVES
TO GENERATE CHANGE AND FIND
FAR MORE SUCCESSFUL
WAYS OF LIVING.

Fullness, not accumulation . . .

An abundance of that fullness
has a peace
that takes us away
from the worry
of our current lives!

The answers have already been proven somewhere:

I took this picture of a Japanese toilet in 1965 - 51 years ago. It is low-flush, dual-flush, has a corner tank available for tight installations, and refills the tank with water from a hand-washing sink in the lid.

Together, these features reduce water use by 90% from the toilets we used then. We still haven' t caught up.

. . . . So just ***DO IT!***

Okay, whew!

This has been a quick, broad-brush overview of ways to reduce our housing (and other) costs by 90%.

For more detail, start with a couple of websites:

www.neahcasa.org - our local community housing land trust site;

www.affordablecomfort.org; and

www.tombender.org - my own website. On it, there are a half-dozen hot-linked topic indexes to the couple-of-hundred articles on the site.

Start with the Affordable Housing Index, and the Sustainable Economics Index.

Recycled pipe.
Scraps of metal.
Old bottles.
Used lumber.

Joy. Passion.
Creativity.
What a dance,
together!