Vancouver Visits

# SSP Kentucky

2009

$10^2$

Planning for

$10^8$

$10^{10}$

# Quantum

## Change

$10^7$

Post Oil Reconfiguration of the Pattern of Community.

Vancouver Visits

# SSP Kentucky

A quick comparison approach....

Is Your Community Sustainable Now?
How about with no more cheap energy, Climate Change, mass migration and with rising oceans affecting the Worlds farmlands & cities?

# Vancouver vs. Lexington

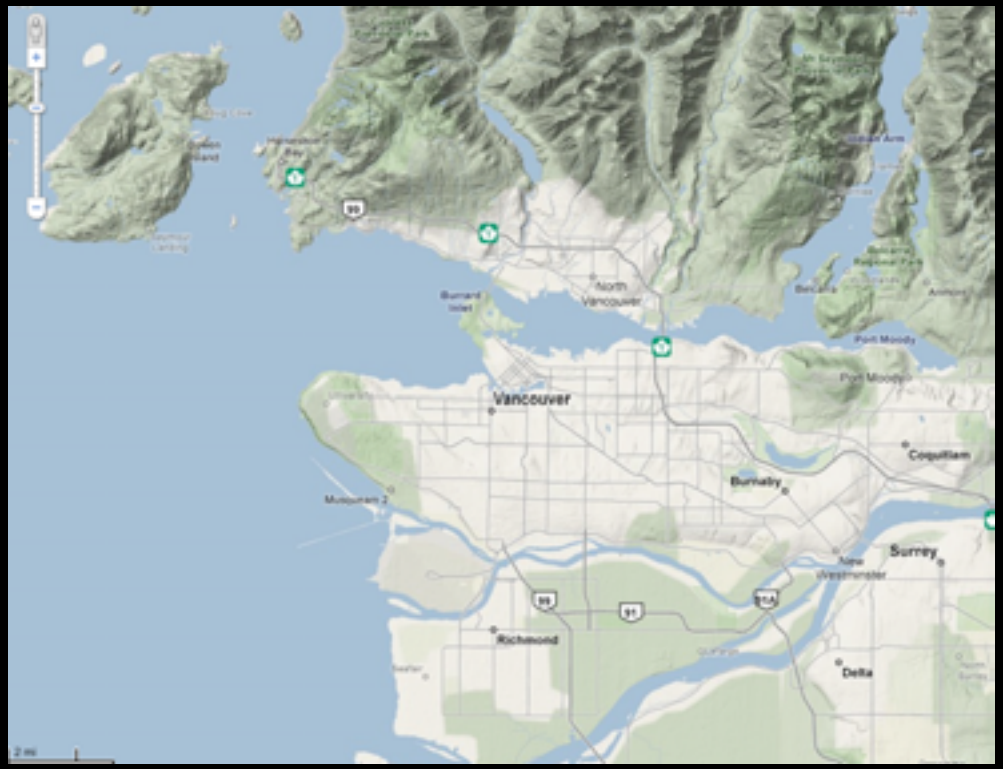
Culture & Landscape




Archipelago in BC
vs
Unending Hills of Kentucky
10 miles x 10 miles =

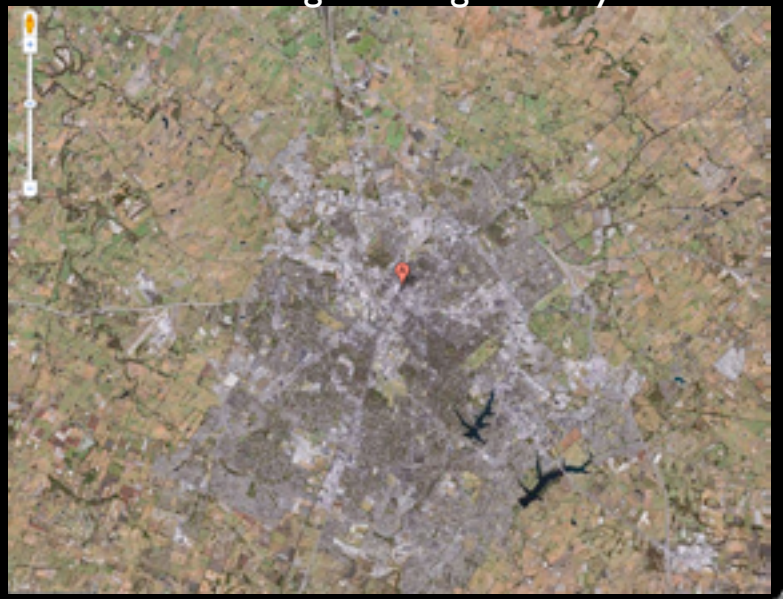
# Urban Footprints/Rural Lands

Look for the inner urban pattern of sustainable Green Fingers




= 2 miles x 2 miles

That which is still green might save you....



# Core Density Patterns

= 500 feet x 500 feet

Near Built-out core at FSR 3 to 9, mid to high rise buildings- Vancouver CBD

Where are the Green Fingers of Sustainable City, the lacework and relief?

Urban to suburban density range- many options are still open- Lexington

# ¿ sustainable city?

Vancouver:
Food sources, locally? As for
water: it is 'the best',
farm soils: only 3% of BC...
energy: world hydro capital

self sufficiency?
A long way to go....
In a crash course: we could make it.
But not with this pattern either.

# Green Fingers Remaining?

Main Urban Agglomerations: Metro built up primary core areas, to scale.

One Million+ in Sea edges & yet to move into the mountains- no land shortage either


Futures?

Vancouver- towns in the mountains

Lexington: Villages in rolling farmlands

100,000 in town and
150,000 in Farm edges & foothills

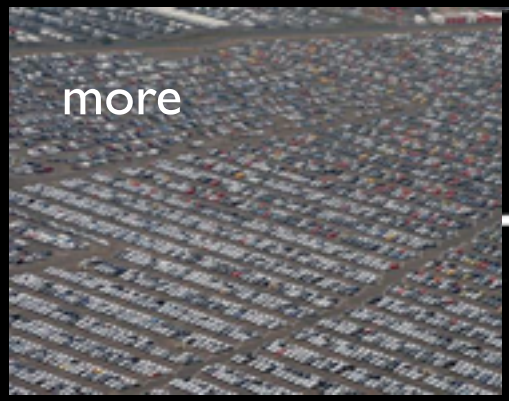
# Perceived Constraints vs None Perceived?

BC: A common perception of constraint when in fact, the mountains are an overlooked opportunity.

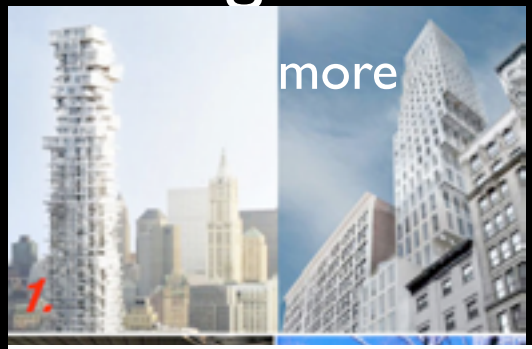

Kentucky: Not really an unlimited biosphere and mass in-migration would show this up.

Quantum Shift in the End of the Oil Age...

# End of an Era: no more linear planning...







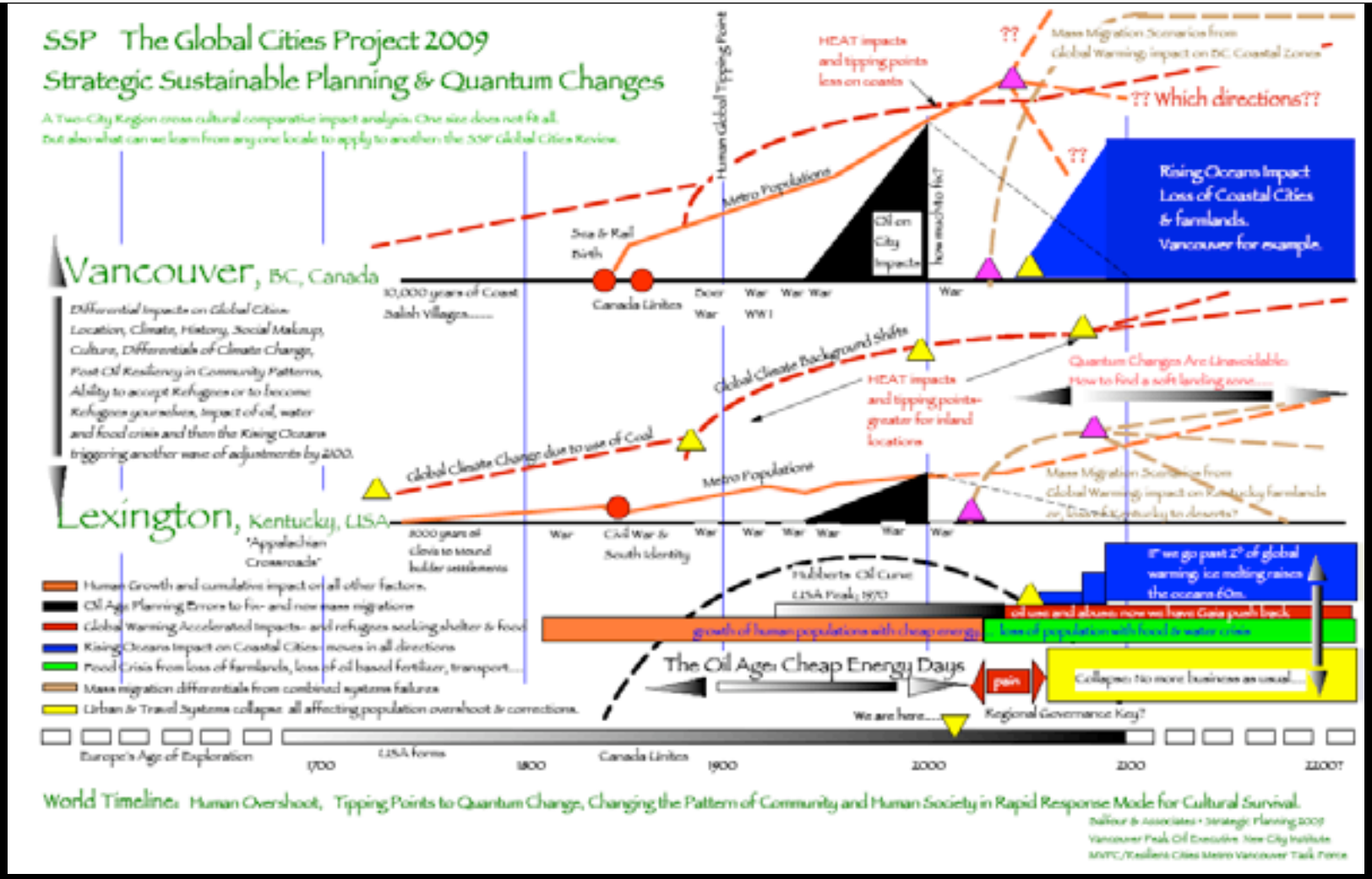


more


Psst: ..... there are no resources left to do all of this any more.....

# International Context

How does each area respond to Global Impacts like mass migration, new settlement forced by decline in oil, water, food, & social opportunity?



SSP The Global Cities Project 2009
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Vancouver, BC, Canada
Differential Impacts on Global Cities:
Location, Climate, History, Social Makeup,
Culture, Differentials of Climate Change,
Post Oil Resiliency in Community Patterns,
Ability to accept Refugees or to become
Refugees yourselves, Impact of oil, water
and food crisis and then the Rising Oceans
triggering another wave of adjustments by 2100.
Lexington, Kentucky, USA
"Appalachian Crossroads"
Human Growth and cumulative impact on all other factors.
Oil Age Planning Errors to fix- and new mass migrations
Global Warming Accelerated Impacts- and refugees seeking shelter & food
Rising Oceans Impact on Coastal Cities- moves in all directions
Food Crisis from loss of farmlands, loss of oil based fertilizer, transport...
Mass migration differentials from combined systems failures
Urban & Travel Systems collapse all affecting population overshoot & corrections.
Human Global Tipping Point
HEAT impacts
and tipping points
less on coasts
??
Mass Migration Scenarios from
Global Warming impact on BC Coastal Zones
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& farmlands.
Vancouver for example.
Metro Populations
Sea & Rail
Birth
Oil on
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how much to fix?
10,000 years of Coast
Salish Villages.....
Canada Unites
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War
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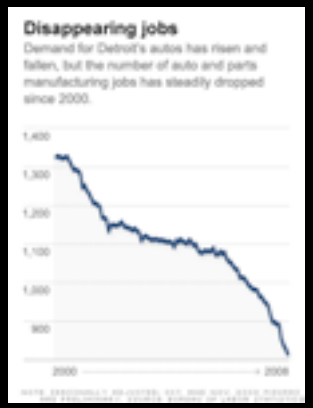
War
War
War
Global Climate Background shifts
Global Climate Change due to use of Coal
HEAT impacts
and tipping points-
greater for inland
locations
Quantum Changes Are Unavoidable:
How to find a soft landing zone...
Metro Populations
Mass Migration Scenarios from
Global Warming impact on Kentucky farmlands
or, Kentucky to deserts?
3000 years of
clovis to mound
builder settlements
War
Civil War &
South Identity
War
War
War
War
War
War
If we go past 2° of global
warming, ice melting raises
the oceans 60m.
Hubberts Oil Curve
USA Peak, 1970
oil use and abuse: now we have Gaia push back
growth of human populations with cheap energy
loss of population with food & water crisis
The Oil Age: Cheap Energy Days
pain
Collapse: No more business as usual....
We are here....
Regional Governance Key?
Europe's Age of Exploration
1700
USA Forms
1800
Canada Unites
1900
2000
2100
22007
World Timeline: Human Overshoot, Tipping Points to Quantum Change, Changing the Pattern of Community and Human Society in Rapid Response Mode for Cultural Survival.
Balfour & Associates • Strategic Planning 2009
Vancouver Peak Oil Executive New City Institute
MVPC/Resilient Cities Metro Vancouver Task Force

# Global Impacts Incoming




- End of Cheap Energy,  with a new Post Oil Economy (fewer) cushy jobs, more need to produce locally.
- End of Key Resources: no more Business as Usual
- Climate change over 4° Celsius just from present abuse of the earth
- Rising Oceans within a century: loss of cities and farmlands
- Mass Migration inevitable as refugees seek "New Edens".

Rising Oceans, 60 meters from shifting Antarctic Ice Sheets

# What Places at High Risk?

- Nation States at risk of loss of lands: Netherlands, Bangladesh, Gulf Emirates, Balkan States, all small island nations, US Eastern Seaboard....
- North American Provinces and States at risk of submergence: PEI, Arctic Coast of Nunuvaat, Florida, south Texas, Louisiana, Rhode Island, Mexican Riviera, San Juan Islands, Guam, ....
- Cities essentially will be lost: New York, London, Oslo, Cairo, St. Petersburg, Shanghai, Tokyo, Mumbai, Venice, Athens, Istanbul, Vancouver, Juneau, LA, Halifax, Prince Rupert, Caracas, Havana, .....

No place is alone: impacts from other areas will touch us all.

# Lands lost to Deserts growing.

- US Southwest: no aquifer, high heat, no water, no energy but solar!
- Southern Europe: the Sahara is crossing the Mediterranean Sea
- China: the Gobi desert marches south
- Australia may have to be evacuated, only two zones left with life.
- Amazon loss of jungle, replaced by desert as we grow soy for pigs...
- Shift of population towards the Poles: but to less productive lands.

Convergence of disasters puts more people into smaller viable areas.

# The Attractant Areas: No Support

- The bread baskets that feed the world are under assault, and dying.
- The new areas for climate refugees cannot sustain the shifts of people.
- Forms of new community cannot repeat the errors of the past.
- The scale of community at each new place has to respect the carrying capacity of the local area.

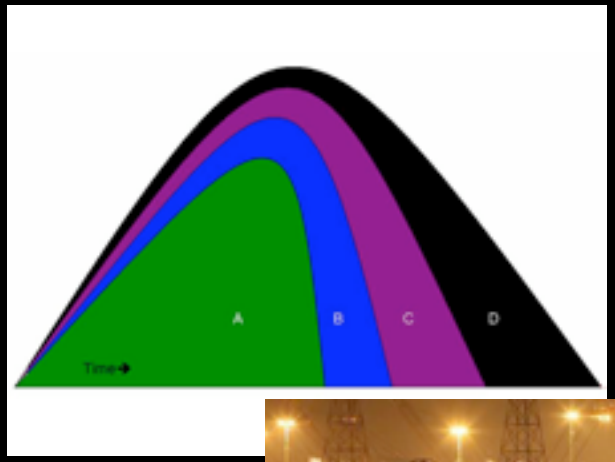
Linear Planning: Are we really planning for the long range or just pretending things will work out?

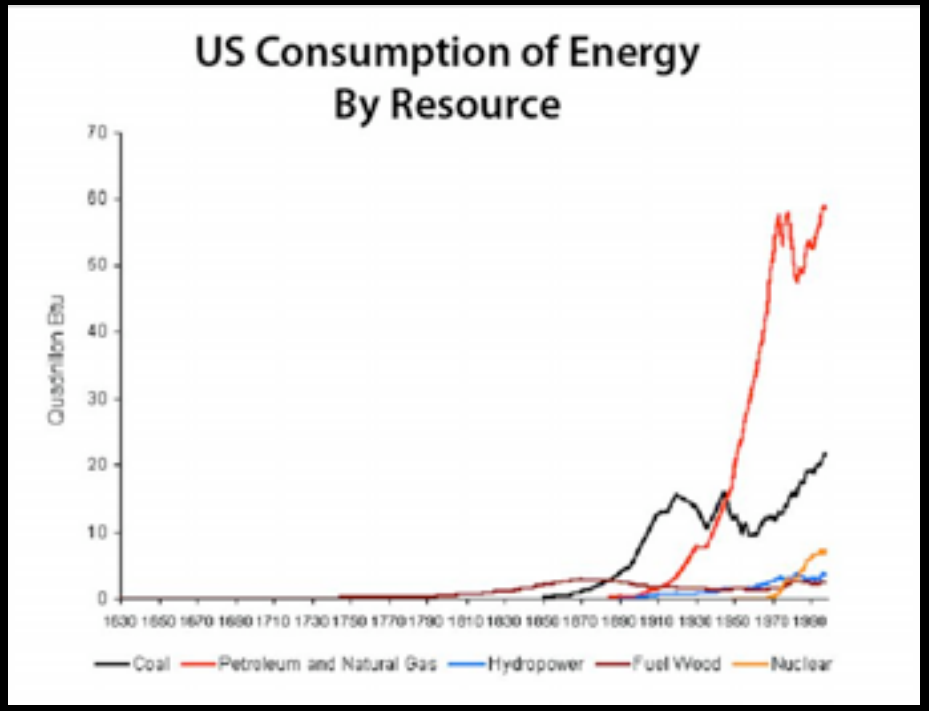
Long Range Impacts of Mass Migration large scale scenarios:

# Lexington & Vancouver

| Lexington | | Vancouver |
|---|---|---|
| Kentucky: farmlands can support 100x more people but for water shortfall. | ⇔ | BC can support 10x more people but best farmlands will be lost to oceans. |
| Warmer climate will increase crops and options at first but then will be at risk of desertification. | ⇔ | Warmer climate will increase crops and options at first but then will be at risk of desertification. |
| Water Storage plans essential but increase of violent storms. | ⇔ | Wetter winters, dry summers, acid rain from China.... |

# Global Impacts: Peak Oil

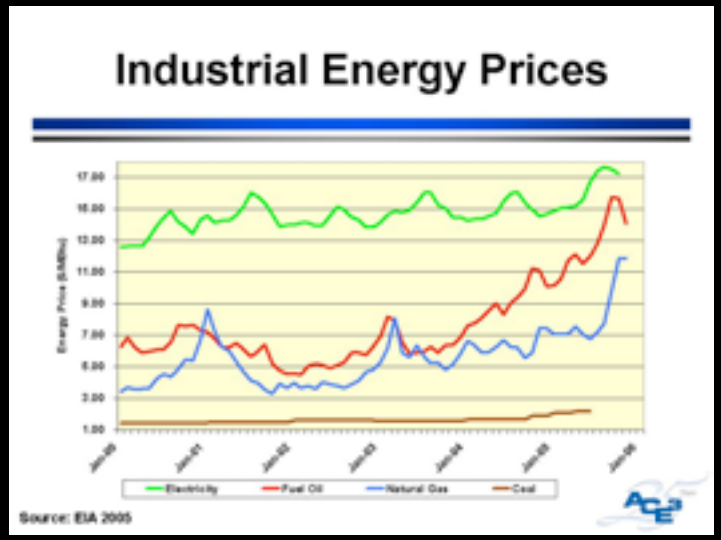


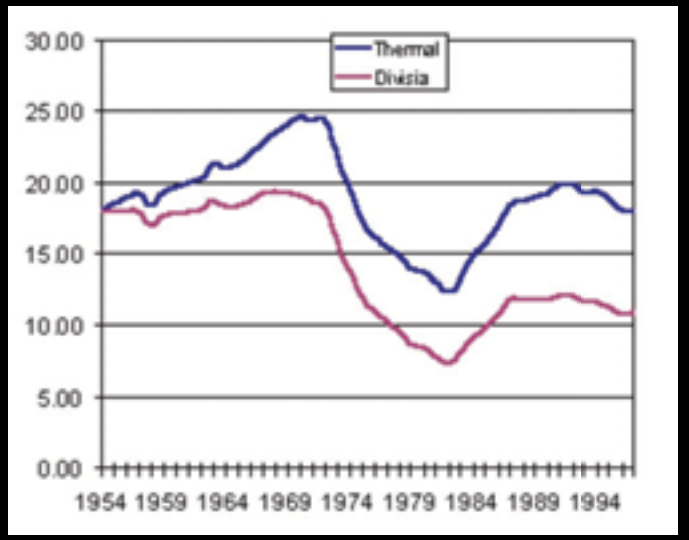




EROI article by Nate Hagens.

# End of Oil Economy

You cannot change your pattern of community fast enough: you should have started in 1970.




"The Divisia EROI is consistently much lower than the thermal equivalent EROI. The principal reason for this is the difference in the fuel mix, and hence fuel quality, between the numerator and denominator of the EROI. The outputs are the crude, unprocessed forms of oil and natural gas. The inputs are electricity and refined fuels such as gasoline and other distillate fuels. The latter are higher quality than the former, and have higher prices. Refined fuels and electricity are, therefore, weighted more heavily in the Divisia formulation."(1)

EROI article by Nate Hagens.

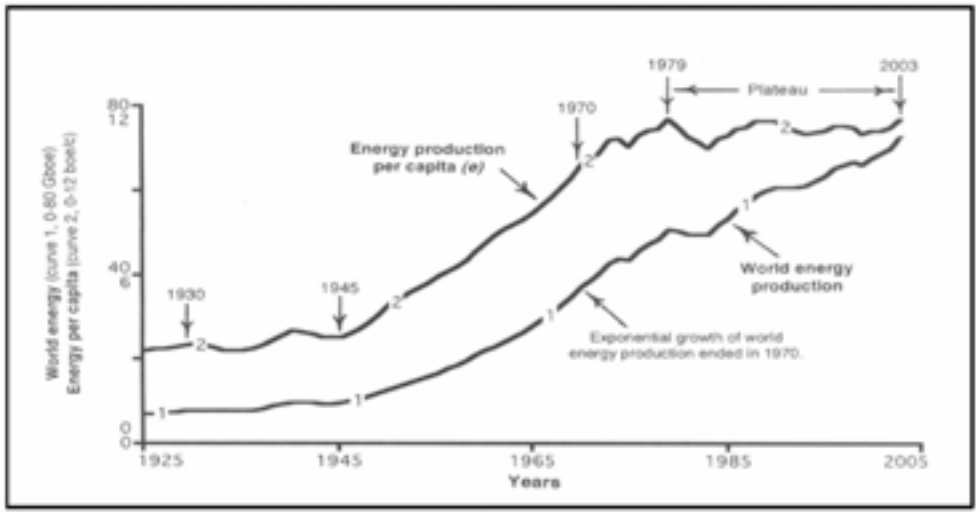
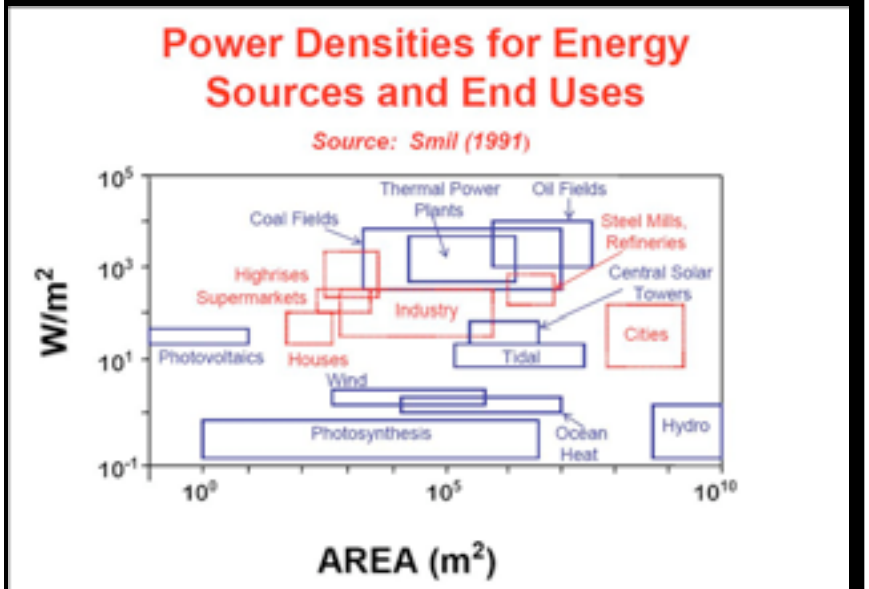



Figure 2. World energy production and energy production per capita. Data sources: 1) for energy – Romer (1985) for 1850-1964 and British Petroleum (2004) for 1965-2003; 2) for population – UN (2004) for 1850-1949 and USCB (2004) for 1950-2003.

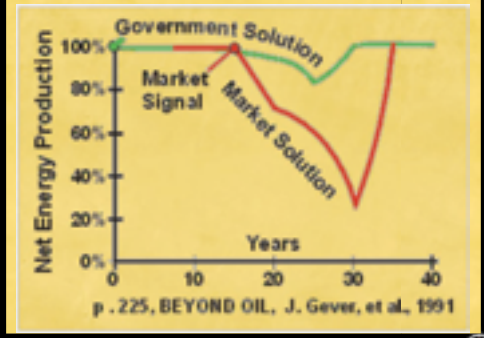



"Energy gain, or EROI, varies with the quality (transformity) of a resource deposit and with the efficiency of the technology used to locate, extract, process, distribute and exploit the resource. As the ease of obtaining or using a resource declines, more energy must be devoted to these activities, causing energy gain to decline. Where an energy budget is substantially constant, allocating more resources to energy production reduces the amount of energy available for other activities. The potential impacts of such a situation on a human system include less leisure time, a lower standard of living, higher taxes, and an increase in childhood mortality. In an animal population, allocating greater effort to energy production may mean less winter fat, increased embryo resorption, lower birth weights, or the like.Tainter(3)

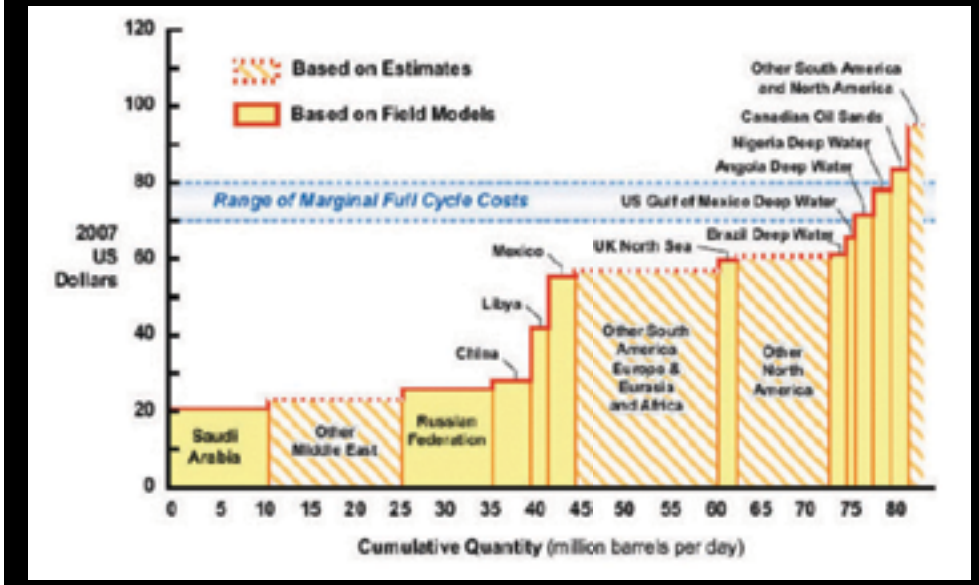
It is fundamentally impossible to maintain a constant level of net energy while the aggregate energy profit ratio drops. Only after the energy profit ratio and the need for new fuel related level off can net energy supplies return to the desired level (4).(This book, Beyond Oil, is 20 years old, but is probably the best book on the concepts of net energy, agriculture and society)

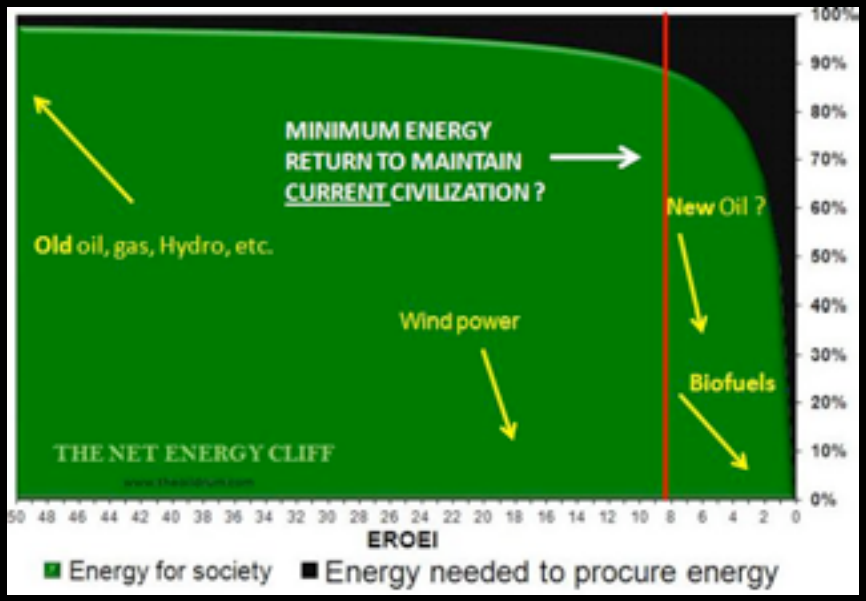
EROI article by Nate Hagens.

Graphic: Cutler Clevelands EROI.

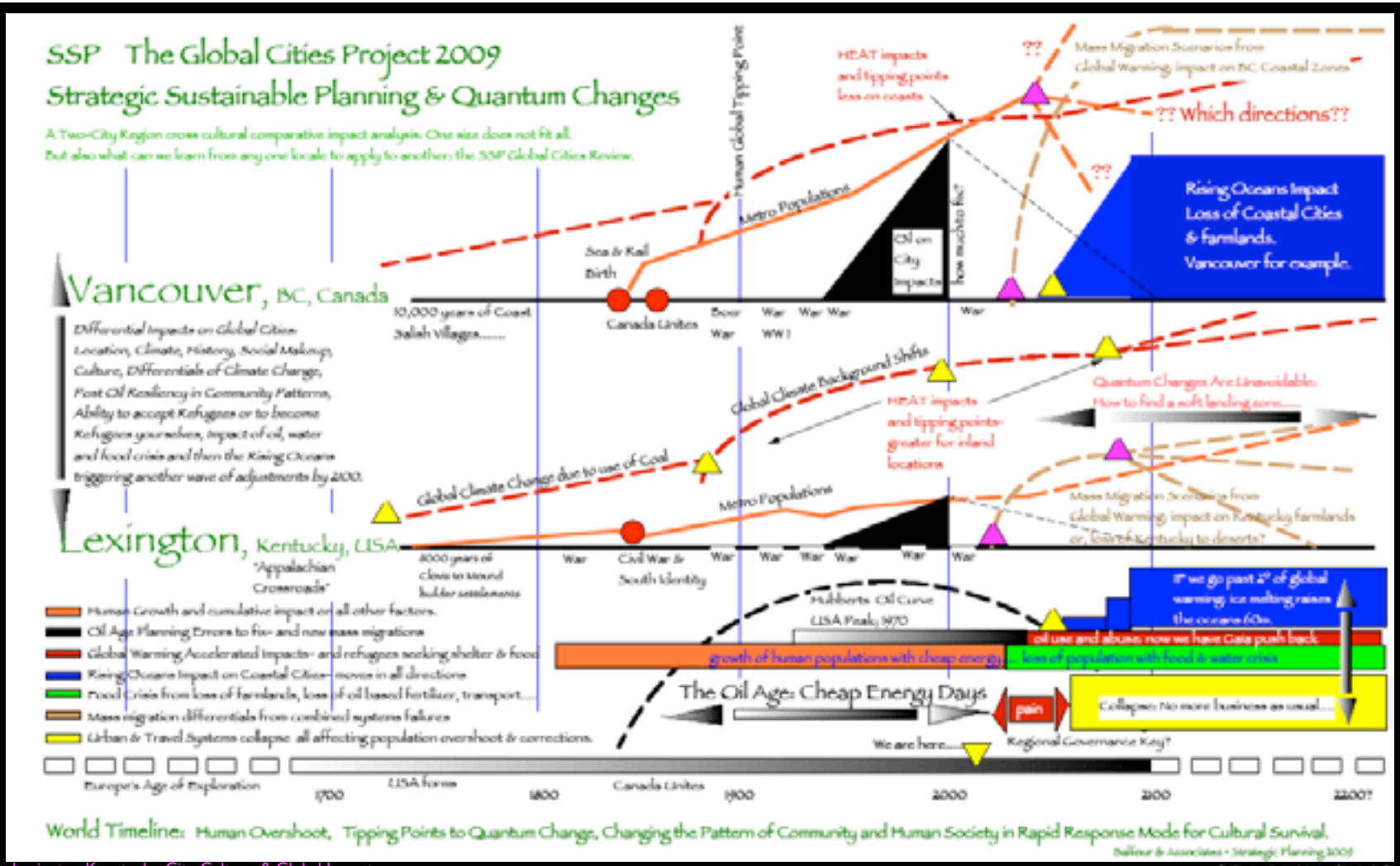


# So, How does the end of energy affect my Pattern of Community?




Our towns were designed on the oil plateau: We are now on a cliff edge...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8000 years of clovis to mound builder settlements
War
Civil War & South Identity
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USA Peak: 1970
oil use and abuse: now we have Gaia push back
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World Timeline: Human Overshoot, Tipping Points to Quantum Change, Changing the Pattern of Community and Human Society in Rapid Response Mode for Cultural Survival.
Balfour & Associates • Strategic Planning 2009


"The problem with NIMBY is that it prevents change - for better or worse."

# Myth Busting 1

Just some quick examples.

1. Density is bad? (NIMBY rule).

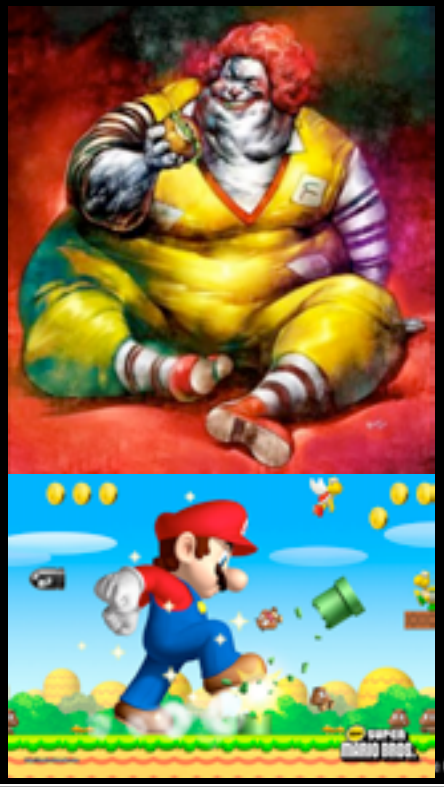
This attitude is based on fear and lack of knowledge about how good design affects lifestyle and city safety. The negative impact of this attitude forces development out to the wrong places, creating sprawl, loss of farmland, transportation waste, pollution, loss of life and living, a false and unsustainable economy.

And inside the city we get wasted and underutilized sites, city services not used, tax inbalances and increased social stratification and tendency to ghetto formation. Crime and density data from poor projects and US neglect of inner cities in the 1960s has been reversed in both Canadian cities and in rediscovered US city centres in 1990s.

# From Global Impacts to Current Planning: all the rules have changed.

If your community operations and your personal lifestyle is based on energy equivalent to having a hundred slaves at your command, and the energy quickly disappears, how do you think you are going to keep doing all the things you have got used to?

The oil age pattern of community is designed on massive consumption of energy to disperse land use and community support activity from food to everyday business like going to school. We have to adjust to a new pattern not in decades but in months; we better get started to lessen the pain.




# Myth Busting II

2. Density is the solution? Wrong. Not always. There is a size where a city will shortly be too big to keep supplied. (The largest 100 cities for instance.

Green fingers of farm forest and field are needed to make for smaller towns and the green spaces to feed them locally.

Marbelization or a lacework pattern of town with country is a closer to historic sustainable pattern, like Europe, Asia, New England and Quebec townships.

# Myth Busting III

3. Vancouver is all built out. Hardly.

In high density and commercial zones, the lots are severely underutilized. The main penninsula of the Metro area could easily take 4x the population and be more livable, protecting the farmlands for production. The mountain sides have yet to be really taken seriously for properly designed settlements.

Vancouver due to mass migration pressures and the new certainty of ocean rising, MUST move to rail transport and to mountain side communities.

# Myth Busting IV

4. High rises must be an efficient form! Wrong.
High rises have a 2 to 3 times more exposed envelope to finish and to insulate against heat and cold compared to mid rise.

The myth of more views for more units also does not hold true once you go beyond a two block infill of apartments.

Mid rise also provides for more garden oriented units at grade as families live in cities plus more opportunity for penthouses, roof gardens & green roofs for community spaces too.

# Myth Busting V

4. High rises are the only dense solution. Wrong.

Mid rise courtyard buildings can equal 30 storey tower forms. This is true due to bylaws for towers stress big setbacks with wasted ground planes, whereas courtyard and street oriented buildings use the setback and use the centre of the block for useable public space. Closer street orientation also provides for eyes on the street or self policing of the neighbourhood.

# Myth Busting VI


5. We can always import food. Wrong.

The cost of transport exceeds the cost of the food.
As we surge through post peak oil pricing,
increasingly foods will not be affordable if imported.
Food security is based on local supply and control
over your most necessary items for life.
External current large food supply areas are under
threat of climate change and water shortages.
Everybody in this case is now at risk of famine unless
we move to local food security immediately.

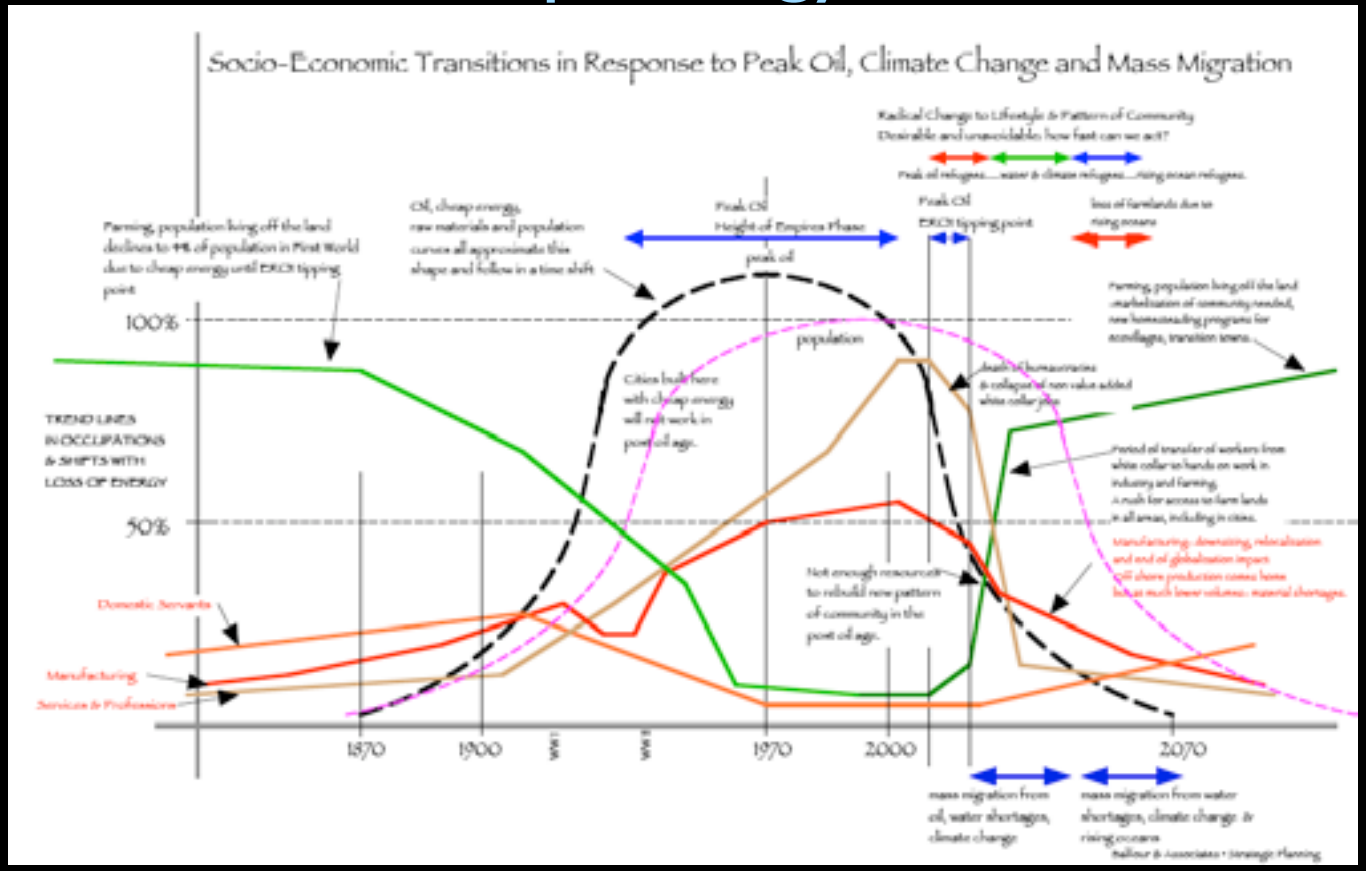
# Myth Busting VII

J. Hatch Pix

Vancouver has no place to grow. Wrong

97% of BC is hills and mountains.
only 3% of BC is farmland
If even 10% of the hill areas are buildable, and they are,
this is still 3x the area of the farmlands.

# The End of Cheap Energy: Work & Lifestyles



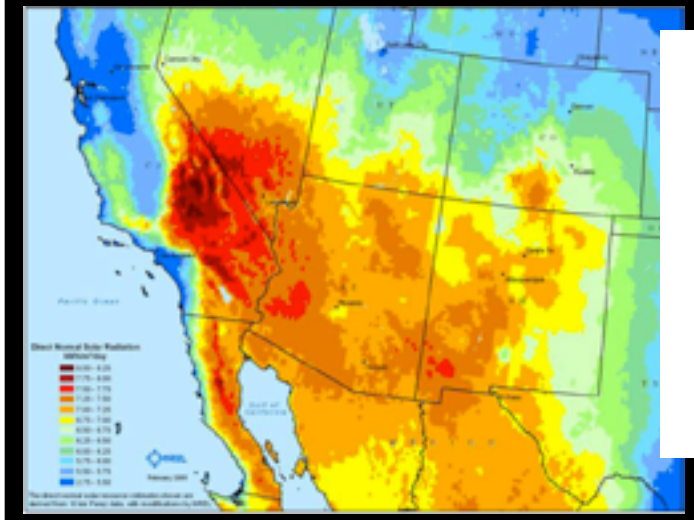

## Energy Efficiency

- ***Buildings*** (40%) – envelope design, daylighting, better lights, building and appliance efficiency standards
- ***Transportation*** (30%) - lighter weight vehicles, public transportation, better propulsion, PHEVs
- ***Industry*** (30%) – heat recovery, better motors, CHP

# Some Technical Rescue Hopes

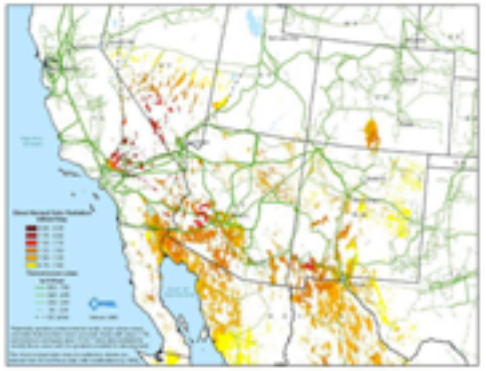
American Solar Energy Society

# Solar



## Deployment of 80,000 MW of CSP

Southwest Solar Resources (With all Filters)
Result: 7,000 GW (7X U.S. capacity)!



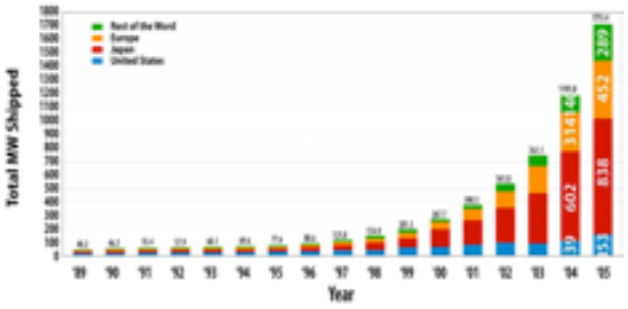
Source: Western Governors' Association study

## CSP Savings

- Dispatchable power with 6 hr of storage
- 80,000 MW, 6 to 13¢/kWh

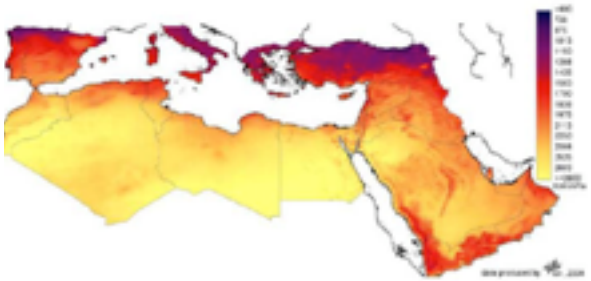
Savings: 63 MtC/yr

## Worldwide PV Shipments




# Long Distance Transmission

## But...The Vulnerability of Grids




"Concentrating Solar Power for the Mediterranean Region," German Aerospace Center (DLR), 2005