Consciousness and Knowledge: Achieving Peace, Prosperity And Life-support Sustainability

An ELSI/Heartland Coalition Publication

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Cover picture Commentary

This is our home. Of all the planets we have found so far, ours is the only one with a life-support system. This system recycles the air we breathe, the water we drink and the food we eat. It also protects us from numerous rays, frequencies, fields, forces, etc. coming from space and considerable space debris.

Space debris is mostly burned up by friction with our planet's atmosphere. We see this as "shooting stars". The earth's magnetic field blocks or blunts various forms of cosmic radiation. If not for our planet's life-support system and earth's magnetic field, the Earth would be as lifeless as Mars appears to be.

Introduction
Please Share Worldwide!!!

www.jimbell.com

Hi, I'm Jim Bell,

Since these words are going out to the world, we probably haven't met until now. So whoever you are and wherever you live, it's nice to make your acquaintance.

I'm sending this out because I care.

I believe that when enough of us care about the well-being of our descendants and theirs, it will be easy to create world peace and bring everything we do for work or play into prosperity and life-support system harmony.

To share what I've discovered toward the above, I often use the San Diego/Tijuana Region, where I live, to show specific examples of how a particular region can become more life-support sustaining. The initial foundational focus for this region or any region is to become renewable energy, water and food self-sufficient. The more a region or even a country becomes self-sufficient in these essentials, the more it controls its economy and way of life.

The specifics of a region or country becoming renewable energy, water and food self-sufficient are dependent on its climate, renewable energy resources available locally and other particulars. Nevertheless, the principles behind making the San Diego/Tijuana Region sustainable can be applied worldwide.

My larger vision is that the economic, health and environmental benefits that the San Diego/Tijuana Region will gain by becoming renewable energy, water and food self-sufficient will be so positive, that the whole world will want to emulate them. The more this happens, the greater the chances that we can bring all human activities into life-support harmony.

Who will be first?

Whether or not the San Diego/Tijuana Region pioneers this effort, any region or country that does will take world leadership in the development and refinement of this vital new emerging industry; the industry of helping regions and countries around the world become sustainable, beginning with becoming renewable energy, water and food self-sufficient.

TELLING IT LIKE IT IS!!!

A Jim Bell & Common Sense Commentary
Sept. 2014 - Update

We humans are something special and rare.

Unlike any other species of life, we can choose to bring all human activities into peace, prosperity and life-support sustainability, or we can continue to damage our planet's life-support system until it fails.

Ultimately, choosing sustainability is about consciousness. If enough of us become conscious enough, it will be easy to create world peace and prosperity. It will be easy to leave our descendants a life-support sustaining world.

Unfortunately, at our present average level of consciousness, our quest to become more conscious will be cut short if we continue to live and make livings in ways that hurt others and cause life-support system harm.

This will result in a human and life in general dieback.* If serious enough, human extinction and even the extinction of life itself becomes a possibility.

*(A dieback is a drastic drop in the population of any particular species of life, or life in general, over a relatively short time period.)

Some people believe that a life-support failure has already begun. They offer evidence that:

+ As of mid-2012, an estimated 15%, or 1/6, of the world's population (more than one billion people) is malnourished or starving. Seventy percent of us (4.9 billion people) are unemployed or under-employed, have zero or next to zero access to healthcare and healthcare insurance, and are poorly nourished, clothed and housed.

+ Human activities are causing the extinction of an estimated 27,000 species of life each year. This corresponds to the rate of extinction around 65 million years ago when "the age of the dinosaurs" came to an end.

There are a number of theories as to its cause, but a consensus of extinction event scientists is leaning toward it being caused by an asteroid as large as 10 kilometers (6.2 miles) in diameter that struck the Yucatan Peninsula in Mexico around the same time.

Over the past 100 years and especially during the past 50 years, the rapid rate of species extinctions has been, and is still being caused by past and ongoing human assaults; assaults on each other as in war and its preparation and assaults on our planet's life-support system. It seems that the human family has become its own asteroid.

Human beings have generally been hard on our planet's life-support system. But prior to the 1800s, the world's population was still relatively small and the human capacity to change the earth was limited to what human and animal power could accomplish.

But with the industrial revolution came the development of powerful machines like bulldozers, steam shovels, tractors, trains and ships and cheap energy to run them. Through the use of these technologies, coupled with the use of dynamite, invented in 1867, the average negative impact on our planet's life-support system, per capita, greatly increased and is still increasing to this day.

Added to the still ongoing industrial revolution, came the chemical revolution. The soldiers of this revolution are chemists. Over the last 80 to 90 years, chemists have been paid to create an estimated 80,000 to 150,000 chemical compounds that never existed on our planet before chemists created them.

Many of these chemical compounds have been and continue to be added to our common planetary life-support system, our common environment, our common air, water and food.

We are now in the midst of biological, biochemical and electronic revolutions. Not surprisingly, these new revolutions are turning out to be just as damaging, and possibly more so, to human and life-support systems' health, than the industrial and chemical revolutions, established before them.

The result is that our bodies and our planet's life-support system are awash with chemical compounds that our bodies and life-support system have had zero experience responding to or processing. Since an estimated 1,000 new chemical compounds are being added to our common environment each year, we are breathing, drinking, eating, wearing, living in, etc., more human-created chemical compounds than ever before in history. This is especially hard on fetuses, infants and the young because they are exposed to these chemical compounds when they are most vulnerable to being harmed by them.

Not only is our average negative per capita impact on each other and our planet's life-support system still growing, the number of humans alive on our planet is growing as well. This growth is credited primarily to medical discoveries made by Louis Pasteur in the 1800s. Since Pasteur's discoveries, coupled with the general advance in prenatal, pediatric and medical care, the world's population has increased from less than a billion people in 1800 to 7.1 billion in 2013. If population growth continues as now, the world's population will grow to 8.1 billion people in 11 to12 years.

But even with all the above given, the bottom line question for those who love their children and grandchildren, for those who feel connected to the human family's future, and for those who feel connected to the beauty, majesty and sustainable productive potential of our planet's life-support system, is:

What should we do to give our children and future generations their best chance to live in a prosperous, peaceful and life-support sustaining future?

On the most fundamental level, answering this question comes down to consciousness. If we, as individuals, and as part of the human family, become conscious enough, it will be easy to resolve human differences without violence or its threat; it will be easy to develop economies and ways of life that are beneficial to everyone and completely life-support sustaining.

Obviously, achieving the above is our task and challenge, but how can this be accomplished?

The answer is simple. We need to develop economies and ways of life that are peaceful, prosperous and life-support sustaining. Here's how:

Step One - Become renewable energy self-sufficient.

When a home, community, city, county, region, state or country becomes renewable energy self-sufficient, it controls its energy supply and price, its economy, its way of life and almost everything else we need or want -- no matter what happens to the price and supply of energy on national and global markets.

Renewable Energy Self-sufficiency in the San Diego/Tijuana Region – 2020

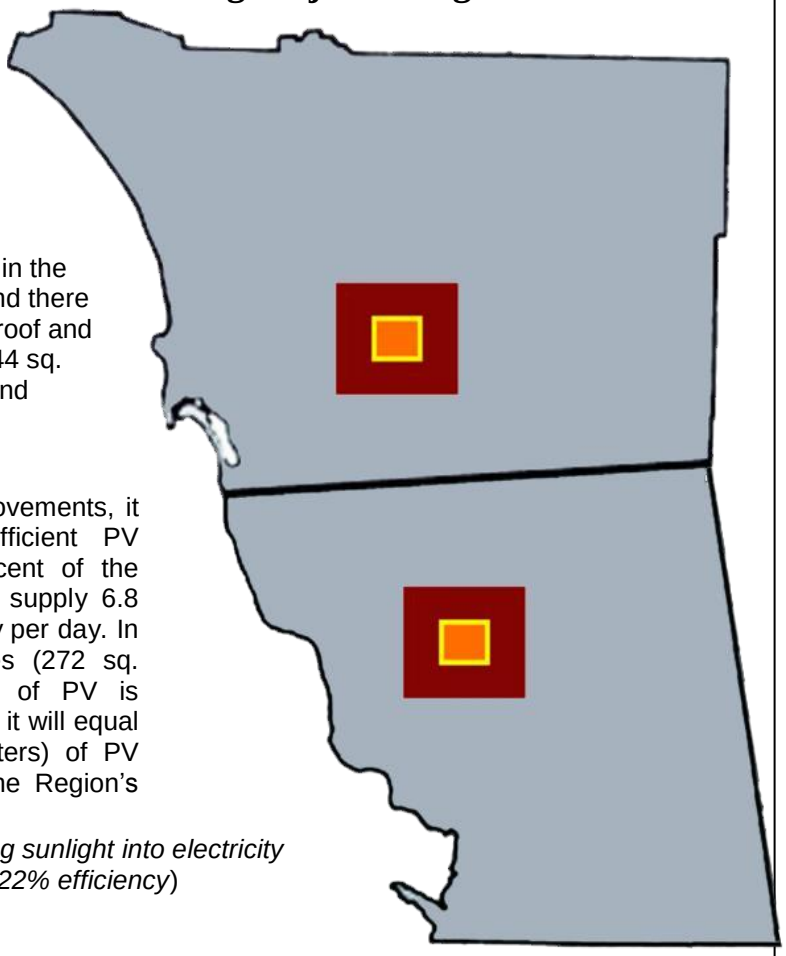
The San Diego/Tijuana Region's land area is 8,522 sq. miles or 22,072 sq. kilometers. The region's estimated 2020 population is 6.8 million people

Assuming that 6.8 million people live in the San Diego Tijuana Region in 2020 and there are 1,000 sq. ft. (92.5 sq. meters) of roof and parking lot per capita, there will be 244 sq. miles or 632 sq. kilometers of roofs and parking lots in the Region

.

With zero efficient energy use improvements, it would require installing 20%* efficient PV (photovoltaic) panels on 43% percent of the Region's roofs and parking lots to supply 6.8 million people with 40 kWh of energy per day. In 2020 this will equal 105 sq. miles (272 sq. kilometers). If the same amount of PV is installed on both sides of the border, it will equal 52.5 sq. miles or (136 sq. kilometers) of PV panels installed on each side of the Region's border.

**Twenty percent efficient at converting sunlight into electricity (Commercial PV panels now exceed 22% efficiency*)



By increasing energy use efficiency by an average of 40%, only 26% of the region's roofs and parking lots would need to be covered by 20% efficient PV panels to make the region renewable energy self-sufficient. In 2020, 26% coverage of the region's roofs and parking lots will equal 31.5 sq. miles on each side of the border.

ASSUMPTIONS:

+ Energy use per capita per day with zero energy use improvements ---------- 40kWh per capita per day
(16 kWh electricity, 24 kWh equivalents, in liquid and gaseous fuels)
+ Energy use per capita per day with a 40% increase in energy use efficiency ---------- 24kWh
+ Yearly average of productive sunlight per day in the San Diego/Tijuana Region ---------- 5 hours

Additionally, solar energy in its various forms is free and even delivered free. The only cost to benefit from it are the labor and materials required to increase energy use efficiency and manufacture and install renewable energy collection devices to produce electricity, hot water, etc. Given that our inventors/developers are still getting better at saving energy and converting various forms of solar energy into

electricity, and other renewably generated fuels, the cost of efficiency improvements and renewably generated energy, will continue to fall.

To make renewable gaseous and liquid fuels, renewably generated electricity can be used to gasify or pyrolyze (heat up in a closed low oxygen chamber) clean wood wastes and landscape trimmings. In the San Diego/Tijuana Region where I live, the sustainable thinning of overgrown chaparral will contribute additional high energy materials for gasification. Thinning chaparral will also improve its habitat value for wildlife by opening it up for new plant growth. Additionally, thinning will reduce the severity and number of wildfires that occur in the Region today.

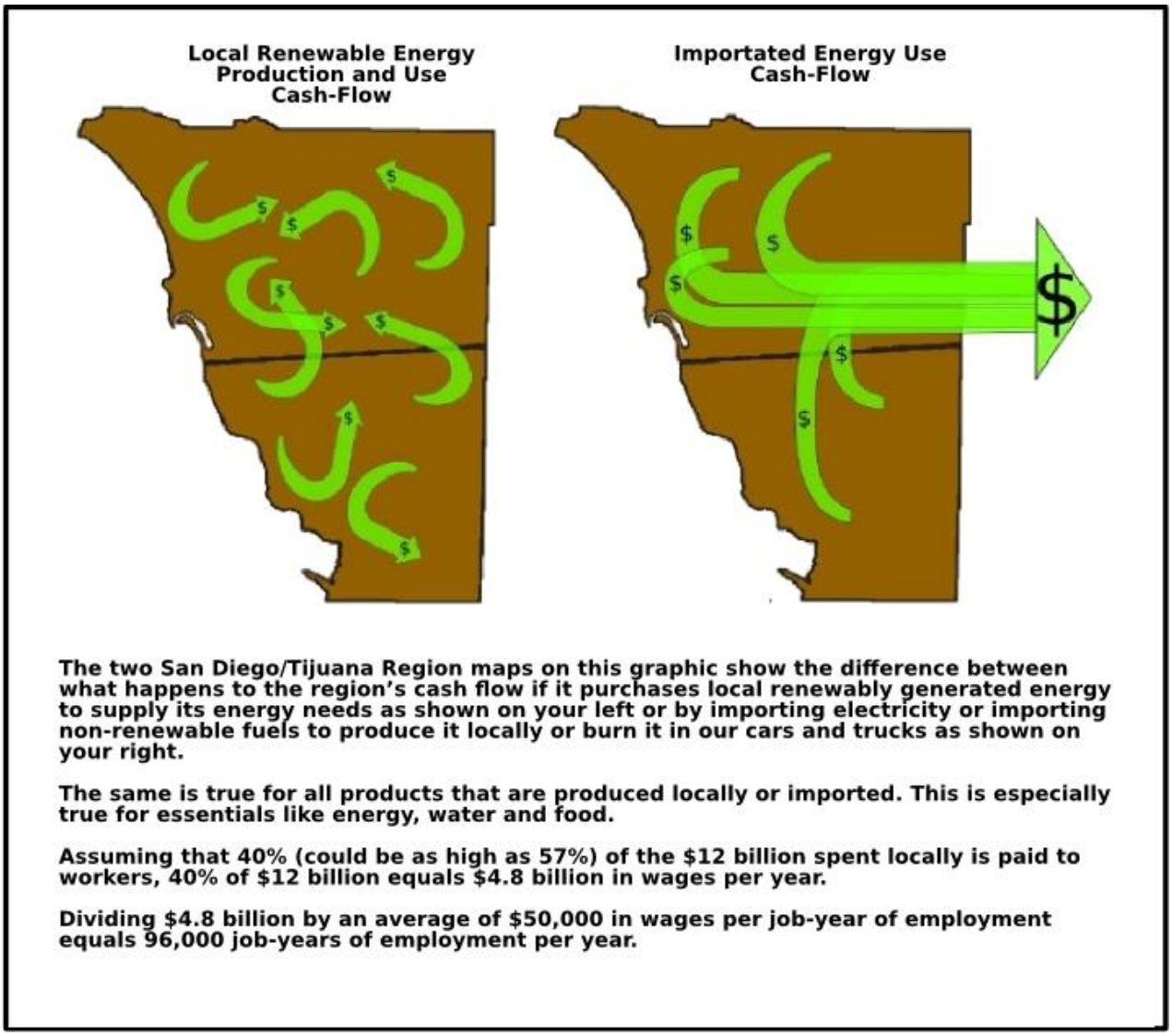
Once the gaseous and liquid fuels in the woody feed-stock are driven off, the mixture is distilled into renewably generated oil and liquid and gaseous fuels. Charcoal and soil amendments are the final products of the pyrolysis process.

Every level of becoming renewable energy self-sufficient creates opportunities. In the San Diego/Tijuana Region there is an abundance of direct sunlight, wind, biomass (plant and animal (including human) wastes), ocean currents, tidal differences, and waves. All these renewable energy sources can be used to make electricity and liquid and gaseous fuels.

But even if direct sunlight was the region's only renewable energy resource, it could become renewable energy self-sufficient by coupling a 40% increase in energy use efficiency and covering 26% of the region's roofs and parking lots with 20% efficient PV panels, (see previous graphics assumptions).

The most efficient commercially available PV panels to date are 22.5% efficient.

As a bonus, purchasing local renewably generated energy to supply the San Diego/Tijuana Region's energy needs will convert the region's current $6 billion negative-energy-purchase-cash-flow, (to pay for energy imports), into a $6 billion positive-energy-purchase-cash-flow. Assuming an economic multiplier benefit of, for every dollar spent on locally generated renewably energy, one additional dollar is spent in the region's local economy. This equals $12 billion in local economic activity per year. Buying locally generated renewable energy will create $12 billion of local economic activity per year, versus a $6 billion cash-flow loss.



Step Two - Become renewable water self-sufficient.

Water is essential to life. It is essential to the water-rich lifestyle most people in the developed world already have and that people in the developing world would like to have. To make the math easy to understand, the following assumptions are used in the calculations that follow:

+ The population of the Greater Tijuana part of the region is more or less the same as the population of San Diego County, currently, 3,100,000 people.

If this is true, the San Diego/Tijuana Region has a population of 6,200,000.

+ Also assumed is that everyone in the Tijuana part of the region would like to use the same amount of water per capita as is used per capita in San Diego County, around 180 gallons per capita per day.

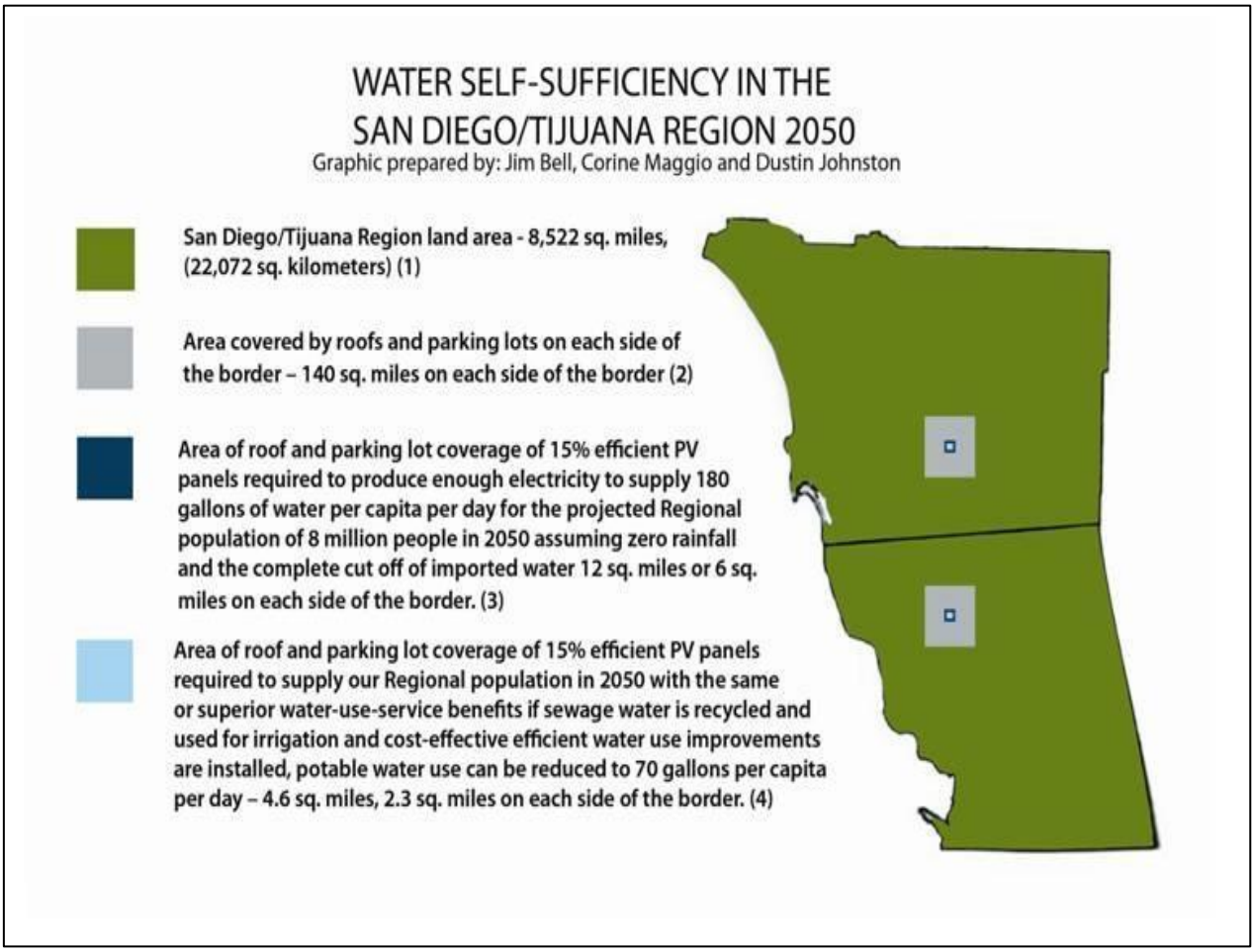
+ Given the assumptions above and assuming the worst case scenario of zero rainfall, zero recycled wastewater and zero imported water, can the San Diego/Tijuana Region become freshwater self-sufficient using renewably generated electricity to convert seawater into freshwater through reverse osmosis (RO)?

The answer is a resounding yes. Installing commercially available 20% efficient PV panels over 4% of the roofs and parking lots on either side of the San Diego/Tijuana Region, will produce 23,039,200 kWh of electricity per day or 11,519,600 kWh of electricity per day on each side of the region's border. Generating 23,039,200 kWh per day times 365 days per year equals 8,409,308,000 kWh per year. Multiplying 8,409,308,000 kWh per year times 65 gallons of freshwater per kWh of electricity consumed, equals 546,605,020,000 gallons of freshwater per year. Dividing 546,605,020,000 gallons by 7.48 gallons per cu, ft. equals 73,075,537,430 cu. ft. of water. Dividing 73,075,537,430 cu. ft. of water by 43,560 cu. ft. per acre foot equals 1,677,583 acre feet of water each year or 838,792 acre ft. of freshwater on each side of the border. (One acre ft. = 4,034 cu. meters.)

For reference, the San Diego County side of the region currently uses around 610,000 acre ft. of fresh water per year including county based agriculture.

If the region used cost-effective and life-support-system-effective ways to use water more efficiently, (low water use toilets, using graywater and disinfected recycled sewage water for irrigation, drip irrigation, collecting and storing rainwater runoff, etc.), only 1.5% of the roofs and parking lots in the region would need to be covered with 20% efficient PV panels to make the whole region completely renewable water self-sufficient.

To protect sea life from the RO process, sand filtered seawater will be extracted from wells close to the ocean. This way, eggs and small fish will be kept out of the RO process. Since the wastewater from the RO process will be twice as salty as seawater, it will be evaporated in shallow open ponds so salt and other minerals left behind can be mined. If any RO waste water needs to be returned to the ocean, it would be diluted by sand-filtered seawater to be no more than 20% saltier than natural seawater before being released into the ocean, diffusely.

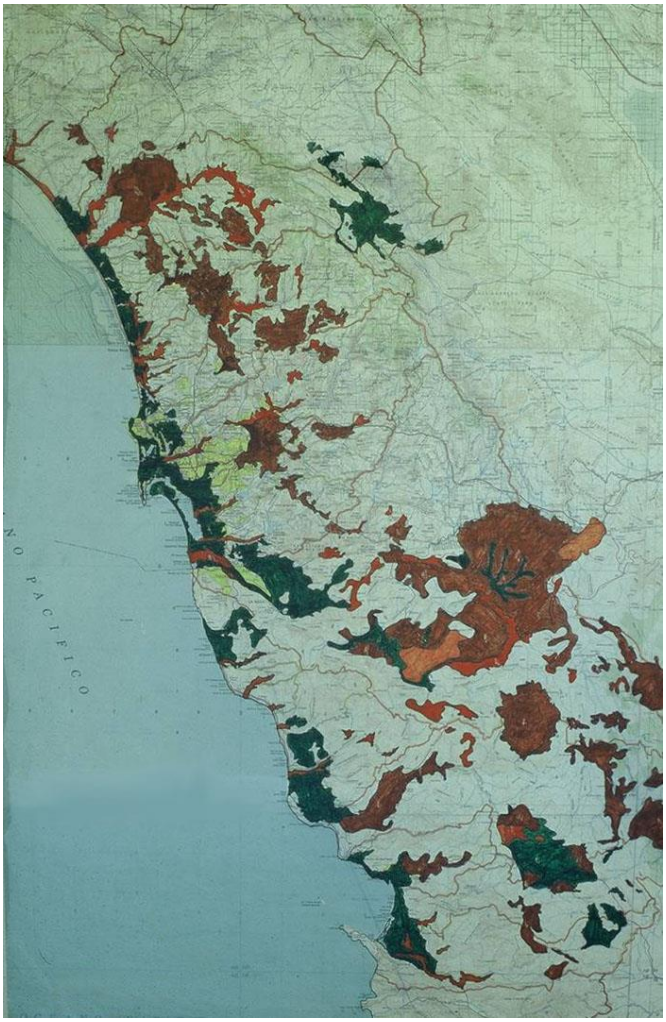


Step Three – Become renewable food self-sufficient.

With renewable energy and water self-sufficiency, comes the ability to be renewable food self-sufficient. It also allows for the growth of a great deal of fiber and lumber for local use and trading.

To make the San Diego/Tijuana Region and our planet permanently food self-sufficient, it is essential that we protect our agricultural soils from further development and other misuse. My research indicates that we still have enough agricultural soil in our region and on our planet to feed everyone a nutritious diet of tasty, sustainably-grown food with lots of variety.

Unfortunately, this will not be true for our region or world for long, if we do not protect and preserve our best agricultural soils for life-support sustaining agriculture and the sustainable production of wood and fiber.



There are 8 agricultural soil classifications in the San Diego/Tijuana Region. The map above only shows the region's 4 best agricultural soils, Red-1, Orange-2, Green-3, Brown-4. Knowing where your region's best agricultural soils are located comes under the heading of determining "where it's appropriate to do what." To develop a truly life-support sustaining future, we need to know about all the region's natural assets like local renewable energy, water and agricultural resources shown in the graphic. We also need to know its hazards like floodplains that flood and are subject to liquefaction during strong earthquakes like Mission Valley.

Step Four - Create a Real Free-Market Economy by Adopting "True-Cost Pricing" or "Cradle to Cradle Pricing".

Today, almost everything humans do causes human and life-support system harm. More precisely, it's not so much about what we do, but about HOW we are doing it.

The ways we support ourselves now depend on converting ever more renewable resources into nonrenewable and often, toxic trash, and in general, using renewable resources in ways that make them difficult to renew.

This begins by artificially reducing the cost of virgin materials versus using recycled materials by using our taxes to subsidize the harvesting and mining of them. The cost of virgin materials is further reduced by exempting material extractors from clean-up and repair after the extraction process is completed. The result is ravaged landscapes, overflowing landfills and ever more destruction of virgin land for raw materials to replace those we despoil and bury.

With true-cost-pricing or cradle-to-cradle pricing, the real cost of all products and services offered in the marketplace would be calculated by an independent unbiased body. This body would be charged with:

+ Determining the true-cost or cradle-to-cradle-cost of all marketplace offerings.

+ Calculating how much money should be added to each product's/service's retail price to cover paying for the health and life-support damage each product or service is causing or will eventually cause. This money will be held in reserve to pay for health and life-support system costs as they manifest. If products/services are ultimately determined to be human and life-support system benign, or even positive, no additional money would be added to their retail price.

Consumer Reports Magazine might be a good group to hire for this job. They carry zero product advertising in their magazine. They are also well known for their unbiased product/service/best value for its cost comparison studies. All they would need to add to their current analysis are human health costs and life-support damage costs.

Currently, the public pays these costs through taxes, health costs, property damage (acid rain), etc. In effect, the public is caught in the ironic position of actually subsidizing, with the taxes we pay, the very products and processes that are harming them, their property and their common life-support system.

Additionally, these subsidies retard the development and the commercialization of technologies that are more health and ecologically benign or even positive by artificially reducing the retail cost of ecological, health and socially damaging products and services.

With true-cost or cradle-to-cradle pricing, products and services with the lowest true and cradle-to-cradle cost would also have the lowest retail market price. As technologies become more ecologically sophisticated there is no reason for commonly used products to be any more expensive to purchase than they are now. In fact, in spite of the subsidies that health and life-support damaging products receive, the market price of some "Green" products is already lower than the harmful, often subsidized, products they replace. Most of them work better too.

Plus, it is always less expensive to prevent ecological, health and social problems than to fix them after they have been created.

Other true-cost/cradle to cradle pricing benefits include:

+ Incentivizing designers and manufacturers to create products and services that are in harmony with human and life-support system health.

+ The elimination of solid waste disposal. With true-cost-pricing or cradle to cradle pricing, everything sold in the marketplace would be designed to be reused, recycled or composted. When all costs are included, this is the most cost-effective thing to do.

+ The elimination of the pollution of the air we breathe, the water we drink and food we consume.

+ The more that people purchase locally produced items, especially essentials like energy, water and food, the more local jobs and business opportunities there will be.

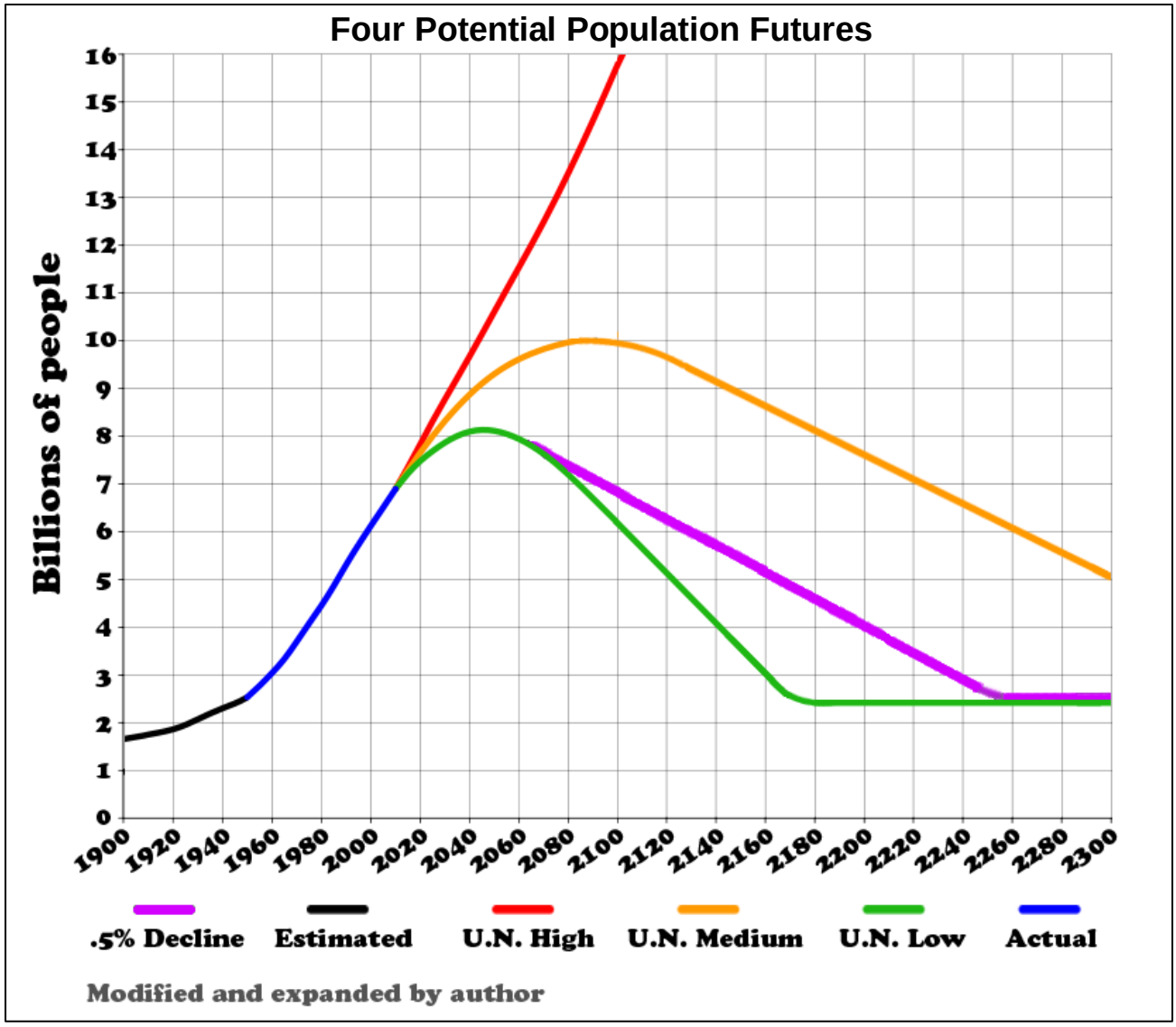
There is a general view that the free enterprise system is the antithesis of a healthy environment. With true-cost/cradle to cradle pricing, free market forces will be powerful tools toward creating a more secure life-support sustaining future for everyone.

Step Five – Reduce Population

The only just way to reduce population is for:
+ Women to be completely free to direct their own lives and especially their sexual lives.

+ Every man becomes an ally to ensure that women have every freedom available to men to direct their own lives, culturally and under the law, and the right to pursue fulfillment in any field of endeavor open to the human family.

+ The world's women to freely choose to have an average of no more than two birth children during their reproductive lives. Since some women would choose to bear zero children and others only one, some women could bear three or more and still meet the average of two births per woman goal. If the average number of children born per woman was two worldwide, the world's population would decline by ½% per year. This would mean that for every 1,000 deaths, there would be only 995 births. A ½% rate of population decline (shown as violet on the graph) would reduce the world's population from 8.1 billion to around 2.7 billion people in 200 years. The world's population around 1960 was 2.7 billion. Even if, for every 1,000 deaths there are only 999 births, the world's population would decline, but at a much slower rate.



Step Six – Protecting the Human Family from Natural Threats

In addition to bringing the human family into human and life-support harmony, there are naturally occurring threats to human and life-support system health and wellbeing. Terrestrial threats include increased volcanic activity or a super-volcano eruption. Such occurrences have the potential to blast enough fine particles of dust and ash into earth's upper atmosphere to reduce or even preclude food production for one or several years. Since we haven't yet developed ways to eliminate such threats and since volcanic activity can occur without much warning, storing a secure supply of food, water, clothing, shelter and the like is vital to minimize the negative impact that volcanic activity can cause to the human family.

Until a few years ago, storing energy, water, food and other essentials was our only option toward preparing for the occasional collisions with earth-orbit-crossing space-objects large enough to cause significant human and life-support system trauma if they collide with earth.

But, space exploration has shown us that we already have the technology and know-how needed to locate all collision bound space objects large enough to cause serious human and life-support system damage if they collide with us.

We also have the technology and knowhow to alter their course enough to avoid such collisions if we discover them soon enough.

If we start in earnest to create a Space Debris Defense System (SDDS), in ten years, we'd be able to nudge collision bound space objects, as large as 500 to 1,000 meters in diameter, off their collision course with earth. As our SDDS capabilities grow, the courses of much larger space objects could be altered enough to avoided collisions with earth.

As a bonus, developing a SDDS will pay for itself by being able to capture desirable close-passing-space-objects into earth or moon orbits for scientific study and mining.

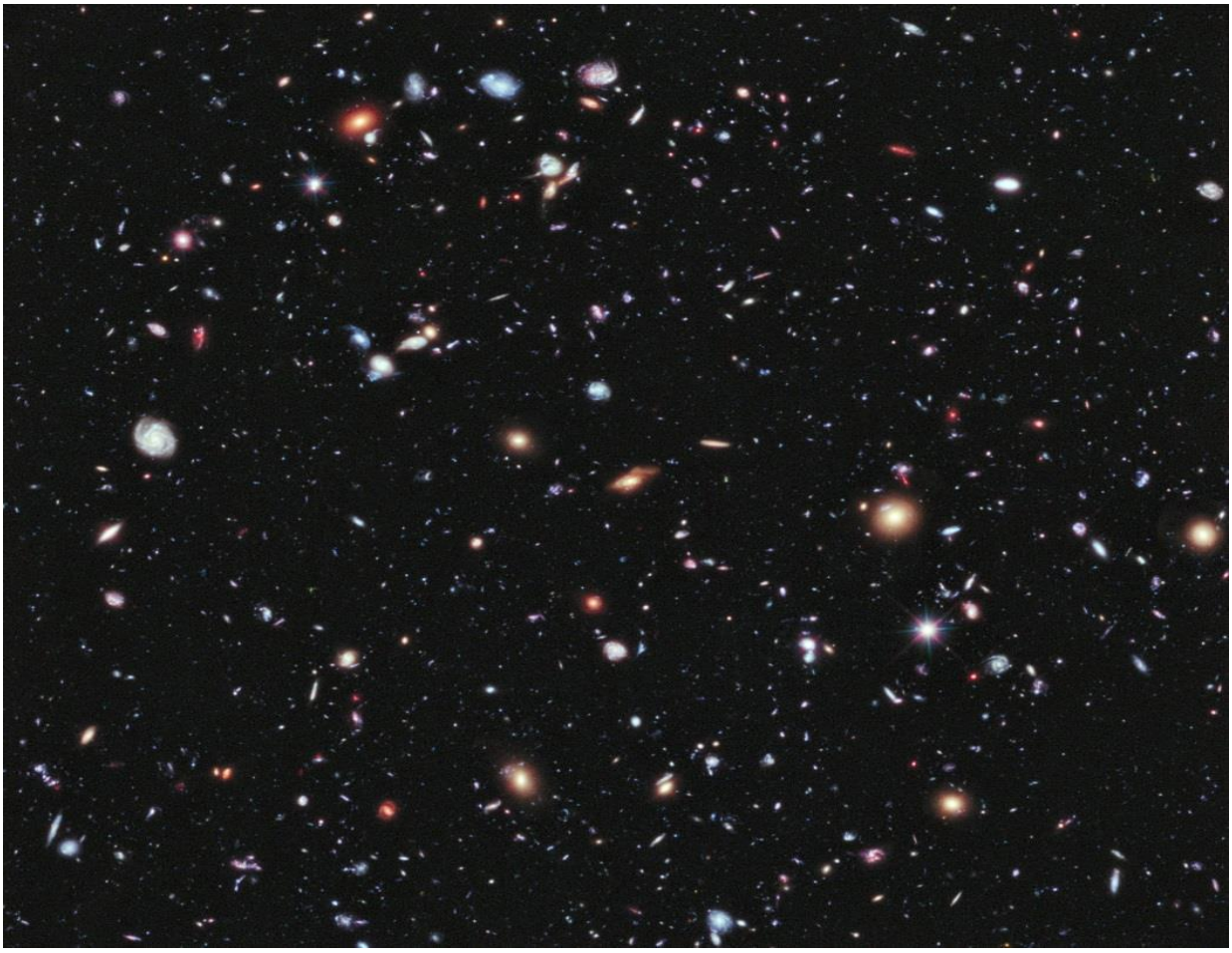
Final Thoughts:

Bottom line, if we want to leave the birthright of a happy, healthy, prosperous, life-supporting sustainable future to our children and future generations, these 6 steps and becoming more conscious are the minimum we must do, and the sooner the better.

We've come so far, why blow it now? We know what can be done. All we have to do is, do it. If those living over the next 60 years or so develop life- support sustaining economies and ways of life planet-wide, there is little to stop us from accomplishing anything we can imagine on this planet and beyond, including the eventual sustainable colonization of other planets in our own galaxy and in the universe beyond, starting with getting it right here first.

For details on an investment strategy to make the San Diego County side of the Region renewable energy, water and food self-sufficient, go to www.jimbell.com and click on "Green Papers". Although this paper focuses on electricity, the same strategy, with slight modifications, can be used to make the whole region renewable energy, water and food self-sufficient as well. The paper shows that even at 2005 prices and PV efficiencies of 10%, becoming renewable electricity self-sufficient in San Diego County, would add billions of dollars to its economy and create over 400,000 job-years of employment. Now, commercially available PV panels are twice as efficient as the 2007 paper assumes and are less expensive too. This strategy can work almost anywhere on our planet, modified for climate, renewable energy sources available and other local conditions.

To Support This Work, Send Donations to the:
Ecological Life Systems Inst. (ELSI),
4862 Voltaire St., San Diego, CA 92107-2108 or
call 619-758-9020 or visit jimbell,com for more information.



Hubble Extreme Deep Field Photograph

This picture was taken from earth by pointing the Hubble Space Telescope at a small seemingly empty area of space. After 2 million seconds of exposure, empty space yielded the estimated 5,500 galaxies in the picture above. Some of these galaxies are calculated to be 90% as old as the universe itself.

This Deep Field Photograph shows that even if earth, our sun and solar system or even our own Milky Way galaxy disappeared from the universe, it wouldn't cause a ripple in the bigger scheme of things.

But, no matter how insignificant we may be, to our out credit, out of potentially billions of species of life that have already existed and gone extinct and an estimated 7.8 million species of life that are alive today, we are the only form of life that can understand the message written in this paper and act on it.

Will we? I don't know. I do know that we have the potential to do it. But if we don't do it soon, our chance to do it will be lost.

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+ As of mid-2012, an estimated 15%, or 1/6, of the world's population (more than one billion people) is malnourished or starving. Seventy percent of us (4.9 billion people) are unemployed or under-employed, have zero or next to zero access to healthcare and healthcare insurance, and are poorly nourished, clothed and housed.

+ Human activities are causing the extinction of an estimated 27,000 species of life each year. This corresponds to the rate of extinction around 65 million years ago when "the age of the dinosaurs" came to an end.

There are a number of theories as to its cause, but a consensus of extinction event scientists is leaning toward it being caused by an asteroid as large as 10 kilometers (6.2 miles) in diameter that struck the Yucatan Peninsula in Mexico around the same time.

Over the past 100 years and especially during the past 50 years, the rapid rate of species extinctions has been, and is still being caused by past and ongoing human assaults; assaults on each other as in war and its preparation and assaults on our planet's life-support system. It seems that the human family has become its own asteroid.

Human beings have generally been hard on our planet's life-support system. But prior to the 1800s, the world's population was still relatively small and the human capacity to change the earth was limited to what human and animal power could accomplish.

But with the industrial revolution came the development of powerful machines like bulldozers, steam shovels, tractors, trains and ships and cheap energy to run them. Through the use of these technologies, coupled with the use of dynamite, invented in 1867, the average negative impact on our planet's life-support system, per capita, greatly increased and is still increasing to this day.

Added to the still ongoing industrial revolution, came the chemical revolution. The soldiers of this revolution are chemists. Over the last 80 to 90 years, chemists have been paid to create an estimated 80,000 to 150,000 chemical compounds that never existed on our planet before chemists created them.

Many of these chemical compounds have been and continue to be added to our common planetary life-support system, our common environment, our common air, water and food.

We are now in the midst of biological, biochemical and electronic revolutions. Not surprisingly, these new revolutions are turning out to be just as damaging, and possibly more so, to human and life-support systems' health, than the industrial and chemical revolutions, established before them.

The result is that our bodies and our planet's life-support system are awash with chemical compounds that our bodies and life-support system have had zero experience responding to or processing. Since an estimated 1,000 new chemical compounds are being added to our common environment each year, we are breathing, drinking, eating, wearing, living in, etc., more human-created chemical compounds than ever before in history. This is especially hard on fetuses, infants and the young because they are exposed to these chemical compounds when they are most vulnerable to being harmed by them.

Not only is our average negative per capita impact on each other and our planet's life-support system still growing, the number of humans alive on our planet is growing as well. This growth is credited primarily to medical discoveries made by Louis Pasteur in the 1800s. Since Pasteur's discoveries, coupled with the general advance in prenatal, pediatric and medical care, the world's population has increased from less than a billion people in 1800 to 7.1 billion in 2013. If population growth continues as now, the world's population will grow to 8.1 billion people in 11 to12 years.

But even with all the above given, the bottom line question for those who love their children and grandchildren, for those who feel connected to the human family's future, and for those who feel connected to the beauty, majesty and sustainable productive potential of our planet's life-support system, is:

What should we do to give our children and future generations their best chance to live in a prosperous, peaceful and life-support sustaining future?

On the most fundamental level, answering this question comes down to consciousness. If we, as individuals, and as part of the human family, become conscious enough, it will be easy to resolve human differences without violence or its threat; it will be easy to develop economies and ways of life that are beneficial to everyone and completely life-support sustaining.

Obviously, achieving the above is our task and challenge, but how can this be accomplished?

The answer is simple. We need to develop economies and ways of life that are peaceful, prosperous and life-support sustaining. Here's how:

Step One - Become renewable energy self-sufficient.

When a home, community, city, county, region, state or country becomes renewable energy self-sufficient, it controls its energy supply and price, its economy, its way of life and almost everything else we need or want -- no matter what happens to the price and supply of energy on national and global markets.

Renewable Energy Self-sufficiency in the San Diego/Tijuana Region – 2020

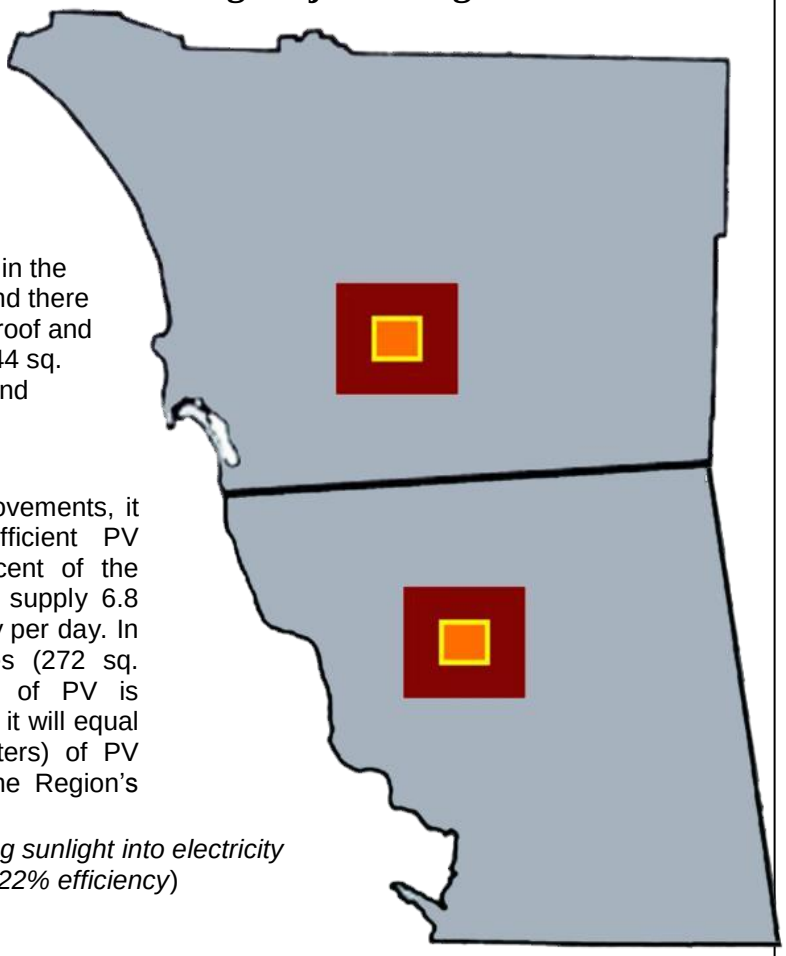
The San Diego/Tijuana Region's land area is 8,522 sq. miles or 22,072 sq. kilometers. The region's estimated 2020 population is 6.8 million people

Assuming that 6.8 million people live in the San Diego Tijuana Region in 2020 and there are 1,000 sq. ft. (92.5 sq. meters) of roof and parking lot per capita, there will be 244 sq. miles or 632 sq. kilometers of roofs and parking lots in the Region

.

With zero efficient energy use improvements, it would require installing 20%* efficient PV (photovoltaic) panels on 43% percent of the Region's roofs and parking lots to supply 6.8 million people with 40 kWh of energy per day. In 2020 this will equal 105 sq. miles (272 sq. kilometers). If the same amount of PV is installed on both sides of the border, it will equal 52.5 sq. miles or (136 sq. kilometers) of PV panels installed on each side of the Region's border.

**Twenty percent efficient at converting sunlight into electricity (Commercial PV panels now exceed 22% efficiency*)



By increasing energy use efficiency by an average of 40%, only 26% of the region's roofs and parking lots would need to be covered by 20% efficient PV panels to make the region renewable energy self-sufficient. In 2020, 26% coverage of the region's roofs and parking lots will equal 31.5 sq. miles on each side of the border.

ASSUMPTIONS:

+ Energy use per capita per day with zero energy use improvements ---------- 40kWh per capita per day
(16 kWh electricity, 24 kWh equivalents, in liquid and gaseous fuels)
+ Energy use per capita per day with a 40% increase in energy use efficiency ---------- 24kWh
+ Yearly average of productive sunlight per day in the San Diego/Tijuana Region ---------- 5 hours

Additionally, solar energy in its various forms is free and even delivered free. The only cost to benefit from it are the labor and materials required to increase energy use efficiency and manufacture and install renewable energy collection devices to produce electricity, hot water, etc. Given that our inventors/developers are still getting better at saving energy and converting various forms of solar energy into

electricity, and other renewably generated fuels, the cost of efficiency improvements and renewably generated energy, will continue to fall.

To make renewable gaseous and liquid fuels, renewably generated electricity can be used to gasify or pyrolyze (heat up in a closed low oxygen chamber) clean wood wastes and landscape trimmings. In the San Diego/Tijuana Region where I live, the sustainable thinning of overgrown chaparral will contribute additional high energy materials for gasification. Thinning chaparral will also improve its habitat value for wildlife by opening it up for new plant growth. Additionally, thinning will reduce the severity and number of wildfires that occur in the Region today.

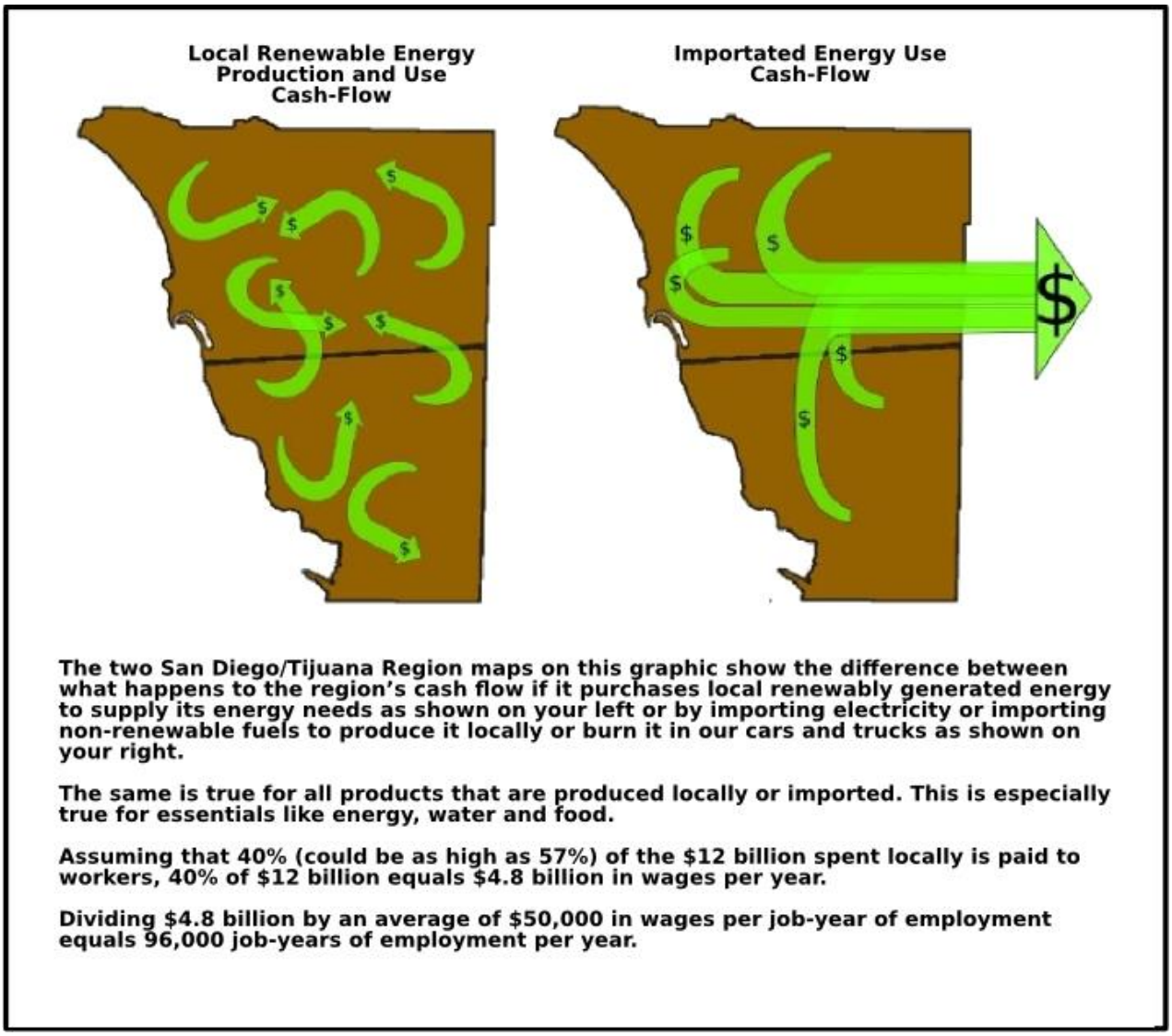
Once the gaseous and liquid fuels in the woody feed-stock are driven off, the mixture is distilled into renewably generated oil and liquid and gaseous fuels. Charcoal and soil amendments are the final products of the pyrolysis process.

Every level of becoming renewable energy self-sufficient creates opportunities. In the San Diego/Tijuana Region there is an abundance of direct sunlight, wind, biomass (plant and animal (including human) wastes), ocean currents, tidal differences, and waves. All these renewable energy sources can be used to make electricity and liquid and gaseous fuels.

But even if direct sunlight was the region's only renewable energy resource, it could become renewable energy self-sufficient by coupling a 40% increase in energy use efficiency and covering 26% of the region's roofs and parking lots with 20% efficient PV panels, (see previous graphics assumptions).

The most efficient commercially available PV panels to date are 22.5% efficient.

As a bonus, purchasing local renewably generated energy to supply the San Diego/Tijuana Region's energy needs will convert the region's current $6 billion negative-energy-purchase-cash-flow, (to pay for energy imports), into a $6 billion positive-energy-purchase-cash-flow. Assuming an economic multiplier benefit of, for every dollar spent on locally generated renewably energy, one additional dollar is spent in the region's local economy. This equals $12 billion in local economic activity per year. Buying locally generated renewable energy will create $12 billion of local economic activity per year, versus a $6 billion cash-flow loss.



Step Two - Become renewable water self-sufficient.

Water is essential to life. It is essential to the water-rich lifestyle most people in the developed world already have and that people in the developing world would like to have. To make the math easy to understand, the following assumptions are used in the calculations that follow:

+ The population of the Greater Tijuana part of the region is more or less the same as the population of San Diego County, currently, 3,100,000 people.

If this is true, the San Diego/Tijuana Region has a population of 6,200,000.

+ Also assumed is that everyone in the Tijuana part of the region would like to use the same amount of water per capita as is used per capita in San Diego County, around 180 gallons per capita per day.

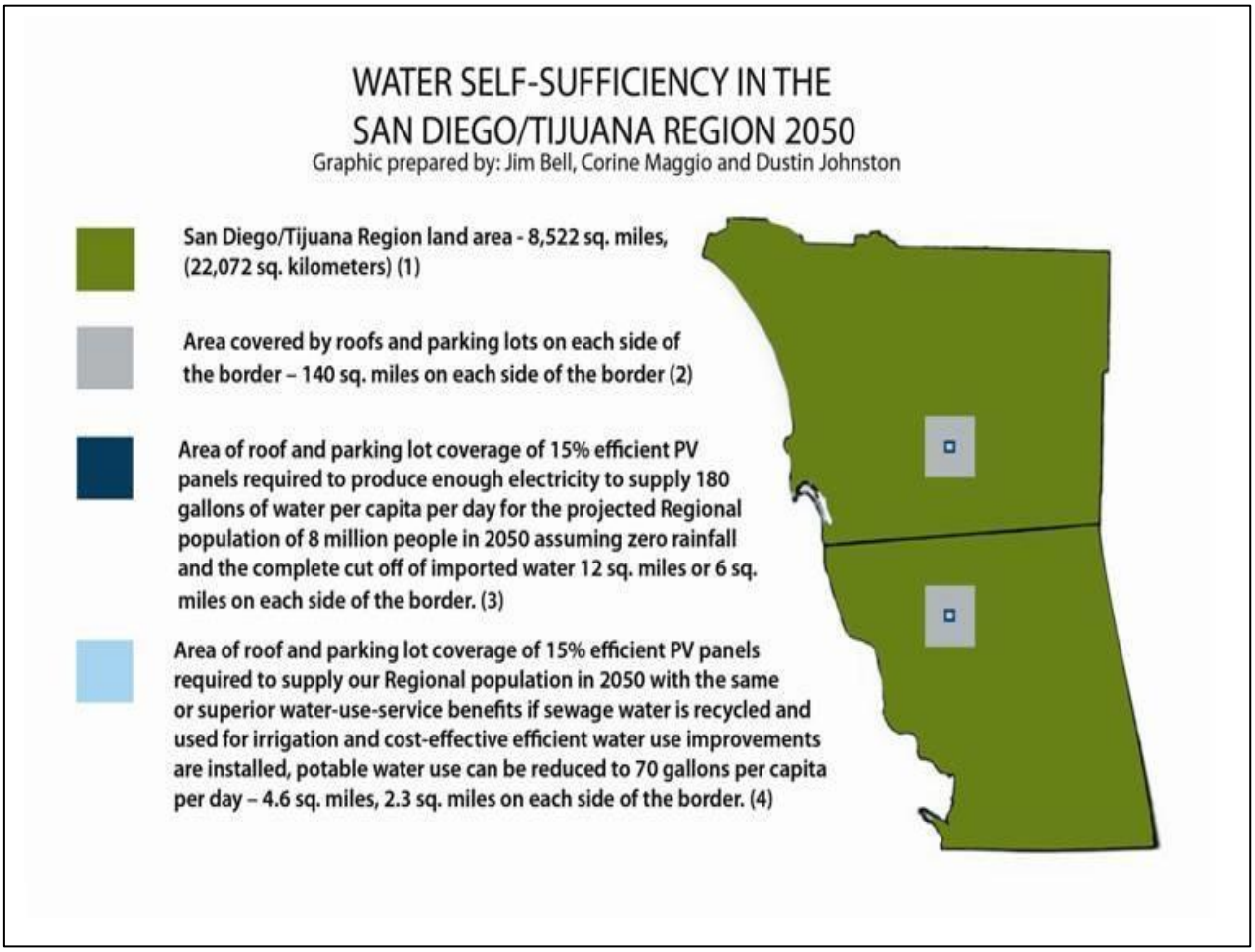
+ Given the assumptions above and assuming the worst case scenario of zero rainfall, zero recycled wastewater and zero imported water, can the San Diego/Tijuana Region become freshwater self-sufficient using renewably generated electricity to convert seawater into freshwater through reverse osmosis (RO)?

The answer is a resounding yes. Installing commercially available 20% efficient PV panels over 4% of the roofs and parking lots on either side of the San Diego/Tijuana Region, will produce 23,039,200 kWh of electricity per day or 11,519,600 kWh of electricity per day on each side of the region's border. Generating 23,039,200 kWh per day times 365 days per year equals 8,409,308,000 kWh per year. Multiplying 8,409,308,000 kWh per year times 65 gallons of freshwater per kWh of electricity consumed, equals 546,605,020,000 gallons of freshwater per year. Dividing 546,605,020,000 gallons by 7.48 gallons per cu, ft. equals 73,075,537,430 cu. ft. of water. Dividing 73,075,537,430 cu. ft. of water by 43,560 cu. ft. per acre foot equals 1,677,583 acre feet of water each year or 838,792 acre ft. of freshwater on each side of the border. (One acre ft. = 4,034 cu. meters.)

For reference, the San Diego County side of the region currently uses around 610,000 acre ft. of fresh water per year including county based agriculture.

If the region used cost-effective and life-support-system-effective ways to use water more efficiently, (low water use toilets, using graywater and disinfected recycled sewage water for irrigation, drip irrigation, collecting and storing rainwater runoff, etc.), only 1.5% of the roofs and parking lots in the region would need to be covered with 20% efficient PV panels to make the whole region completely renewable water self-sufficient.

To protect sea life from the RO process, sand filtered seawater will be extracted from wells close to the ocean. This way, eggs and small fish will be kept out of the RO process. Since the wastewater from the RO process will be twice as salty as seawater, it will be evaporated in shallow open ponds so salt and other minerals left behind can be mined. If any RO waste water needs to be returned to the ocean, it would be diluted by sand-filtered seawater to be no more than 20% saltier than natural seawater before being released into the ocean, diffusely.

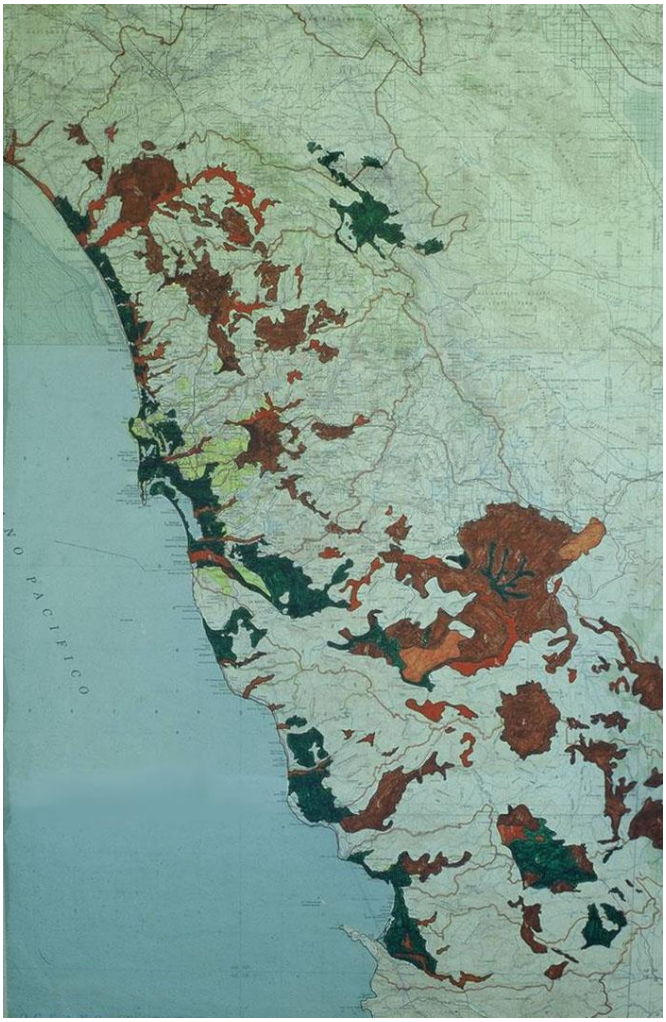


Step Three – Become renewable food self-sufficient.

With renewable energy and water self-sufficiency, comes the ability to be renewable food self-sufficient. It also allows for the growth of a great deal of fiber and lumber for local use and trading.

To make the San Diego/Tijuana Region and our planet permanently food self-sufficient, it is essential that we protect our agricultural soils from further development and other misuse. My research indicates that we still have enough agricultural soil in our region and on our planet to feed everyone a nutritious diet of tasty, sustainably-grown food with lots of variety.

Unfortunately, this will not be true for our region or world for long, if we do not protect and preserve our best agricultural soils for life-support sustaining agriculture and the sustainable production of wood and fiber.



There are 8 agricultural soil classifications in the San Diego/Tijuana Region. The map above only shows the region's 4 best agricultural soils, Red-1, Orange-2, Green-3, Brown-4. Knowing where your region's best agricultural soils are located comes under the heading of determining "where it's appropriate to do what." To develop a truly life-support sustaining future, we need to know about all the region's natural assets like local renewable energy, water and agricultural resources shown in the graphic. We also need to know its hazards like floodplains that flood and are subject to liquefaction during strong earthquakes like Mission Valley.

Step Four - Create a Real Free-Market Economy by Adopting "True-Cost Pricing" or "Cradle to Cradle Pricing".

Today, almost everything humans do causes human and life-support system harm. More precisely, it's not so much about what we do, but about HOW we are doing it.

The ways we support ourselves now depend on converting ever more renewable resources into nonrenewable and often, toxic trash, and in general, using renewable resources in ways that make them difficult to renew.

This begins by artificially reducing the cost of virgin materials versus using recycled materials by using our taxes to subsidize the harvesting and mining of them. The cost of virgin materials is further reduced by exempting material extractors from clean-up and repair after the extraction process is completed. The result is ravaged landscapes, overflowing landfills and ever more destruction of virgin land for raw materials to replace those we despoil and bury.

With true-cost-pricing or cradle-to-cradle pricing, the real cost of all products and services offered in the marketplace would be calculated by an independent unbiased body. This body would be charged with:

+ Determining the true-cost or cradle-to-cradle-cost of all marketplace offerings.

+ Calculating how much money should be added to each product's/service's retail price to cover paying for the health and life-support damage each product or service is causing or will eventually cause. This money will be held in reserve to pay for health and life-support system costs as they manifest. If products/services are ultimately determined to be human and life-support system benign, or even positive, no additional money would be added to their retail price.

Consumer Reports Magazine might be a good group to hire for this job. They carry zero product advertising in their magazine. They are also well known for their unbiased product/service/best value for its cost comparison studies. All they would need to add to their current analysis are human health costs and life-support damage costs.

Currently, the public pays these costs through taxes, health costs, property damage (acid rain), etc. In effect, the public is caught in the ironic position of actually subsidizing, with the taxes we pay, the very products and processes that are harming them, their property and their common life-support system.

Additionally, these subsidies retard the development and the commercialization of technologies that are more health and ecologically benign or even positive by artificially reducing the retail cost of ecological, health and socially damaging products and services.

With true-cost or cradle-to-cradle pricing, products and services with the lowest true and cradle-to-cradle cost would also have the lowest retail market price. As technologies become more ecologically sophisticated there is no reason for commonly used products to be any more expensive to purchase than they are now. In fact, in spite of the subsidies that health and life-support damaging products receive, the market price of some "Green" products is already lower than the harmful, often subsidized, products they replace. Most of them work better too.

Plus, it is always less expensive to prevent ecological, health and social problems than to fix them after they have been created.

Other true-cost/cradle to cradle pricing benefits include:

+ Incentivizing designers and manufacturers to create products and services that are in harmony with human and life-support system health.

+ The elimination of solid waste disposal. With true-cost-pricing or cradle to cradle pricing, everything sold in the marketplace would be designed to be reused, recycled or composted. When all costs are included, this is the most cost-effective thing to do.

+ The elimination of the pollution of the air we breathe, the water we drink and food we consume.

+ The more that people purchase locally produced items, especially essentials like energy, water and food, the more local jobs and business opportunities there will be.

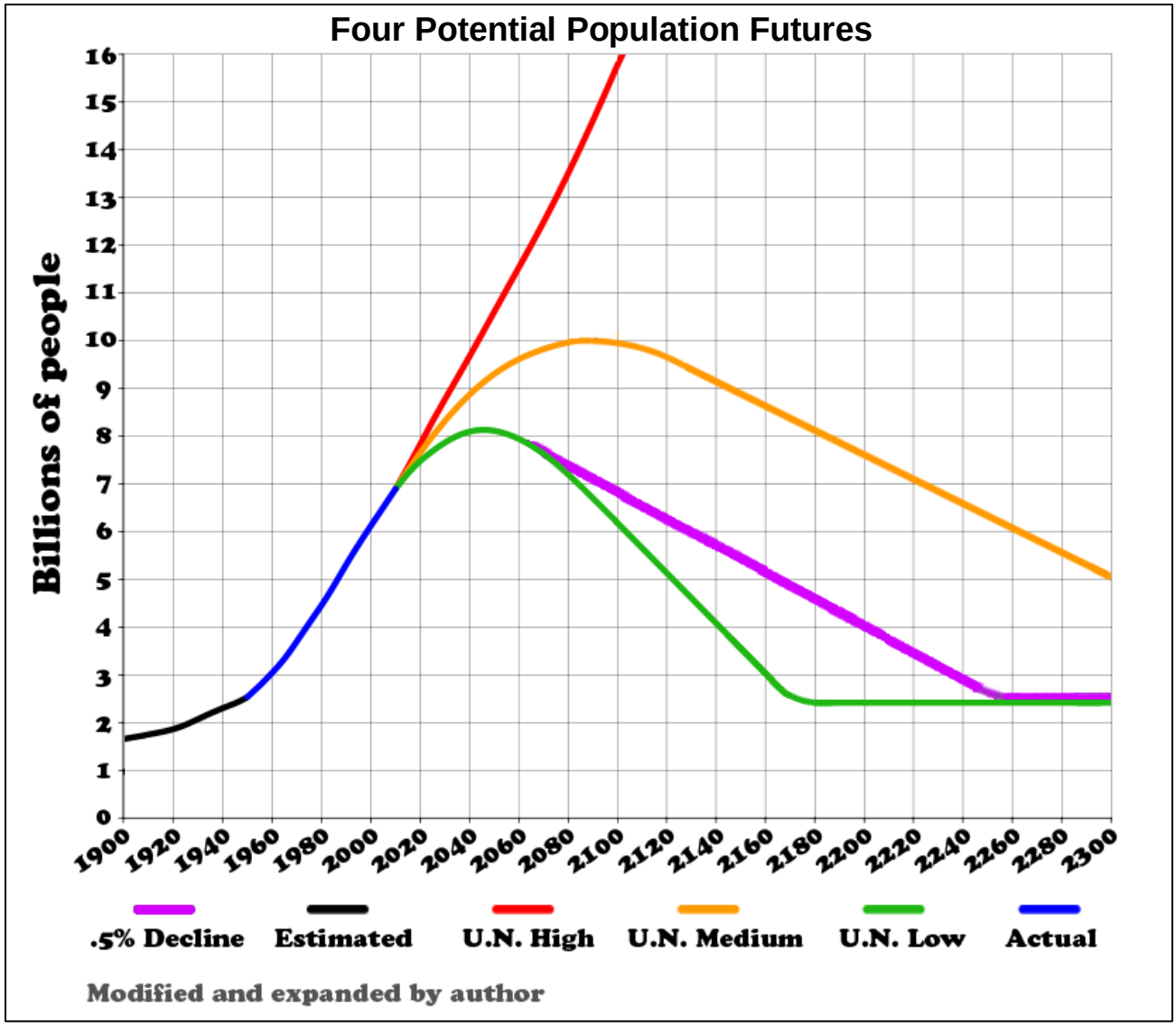
There is a general view that the free enterprise system is the antithesis of a healthy environment. With true-cost/cradle to cradle pricing, free market forces will be powerful tools toward creating a more secure life-support sustaining future for everyone.

Step Five – Reduce Population

The only just way to reduce population is for:
+ Women to be completely free to direct their own lives and especially their sexual lives.

+ Every man becomes an ally to ensure that women have every freedom available to men to direct their own lives, culturally and under the law, and the right to pursue fulfillment in any field of endeavor open to the human family.

+ The world's women to freely choose to have an average of no more than two birth children during their reproductive lives. Since some women would choose to bear zero children and others only one, some women could bear three or more and still meet the average of two births per woman goal. If the average number of children born per woman was two worldwide, the world's population would decline by ½% per year. This would mean that for every 1,000 deaths, there would be only 995 births. A ½% rate of population decline (shown as violet on the graph) would reduce the world's population from 8.1 billion to around 2.7 billion people in 200 years. The world's population around 1960 was 2.7 billion. Even if, for every 1,000 deaths there are only 999 births, the world's population would decline, but at a much slower rate.



Step Six – Protecting the Human Family from Natural Threats

In addition to bringing the human family into human and life-support harmony, there are naturally occurring threats to human and life-support system health and wellbeing. Terrestrial threats include increased volcanic activity or a super-volcano eruption. Such occurrences have the potential to blast enough fine particles of dust and ash into earth's upper atmosphere to reduce or even preclude food production for one or several years. Since we haven't yet developed ways to eliminate such threats and since volcanic activity can occur without much warning, storing a secure supply of food, water, clothing, shelter and the like is vital to minimize the negative impact that volcanic activity can cause to the human family.

Until a few years ago, storing energy, water, food and other essentials was our only option toward preparing for the occasional collisions with earth-orbit-crossing space-objects large enough to cause significant human and life-support system trauma if they collide with earth.

But, space exploration has shown us that we already have the technology and know-how needed to locate all collision bound space objects large enough to cause serious human and life-support system damage if they collide with us.

We also have the technology and knowhow to alter their course enough to avoid such collisions if we discover them soon enough.

If we start in earnest to create a Space Debris Defense System (SDDS), in ten years, we'd be able to nudge collision bound space objects, as large as 500 to 1,000 meters in diameter, off their collision course with earth. As our SDDS capabilities grow, the courses of much larger space objects could be altered enough to avoided collisions with earth.

As a bonus, developing a SDDS will pay for itself by being able to capture desirable close-passing-space-objects into earth or moon orbits for scientific study and mining.

Final Thoughts:

Bottom line, if we want to leave the birthright of a happy, healthy, prosperous, life-supporting sustainable future to our children and future generations, these 6 steps and becoming more conscious are the minimum we must do, and the sooner the better.

We've come so far, why blow it now? We know what can be done. All we have to do is, do it. If those living over the next 60 years or so develop life- support sustaining economies and ways of life planet-wide, there is little to stop us from accomplishing anything we can imagine on this planet and beyond, including the eventual sustainable colonization of other planets in our own galaxy and in the universe beyond, starting with getting it right here first.

For details on an investment strategy to make the San Diego County side of the Region renewable energy, water and food self-sufficient, go to www.jimbell.com and click on "Green Papers". Although this paper focuses on electricity, the same strategy, with slight modifications, can be used to make the whole region renewable energy, water and food self-sufficient as well. The paper shows that even at 2005 prices and PV efficiencies of 10%, becoming renewable electricity self-sufficient in San Diego County, would add billions of dollars to its economy and create over 400,000 job-years of employment. Now, commercially available PV panels are twice as efficient as the 2007 paper assumes and are less expensive too. This strategy can work almost anywhere on our planet, modified for climate, renewable energy sources available and other local conditions.

To Support This Work, Send Donations to the:
Ecological Life Systems Inst. (ELSI),
4862 Voltaire St., San Diego, CA 92107-2108 or
call 619-758-9020 or visit jimbell,com for more information.

Hubble Extreme Deep Field Photograph

This picture was taken from earth by pointing the Hubble Space Telescope at a small seemingly empty area of space. After 2 million seconds of exposure, empty space yielded the estimated 5,500 galaxies in the picture above. Some of these galaxies are calculated to be 90% as old as the universe itself.

This Deep Field Photograph shows that even if earth, our sun and solar system or even our own Milky Way galaxy disappeared from the universe, it wouldn't cause a ripple in the bigger scheme of things.

But, no matter how insignificant we may be, to our out credit, out of potentially billions of species of life that have already existed and gone extinct and an estimated 7.8 million species of life that are alive today, we are the only form of life that can understand the message written in this paper and act on it.

Will we? I don't know. I do know that we have the potential to do it. But if we don't do it soon, our chance to do it will be lost.