

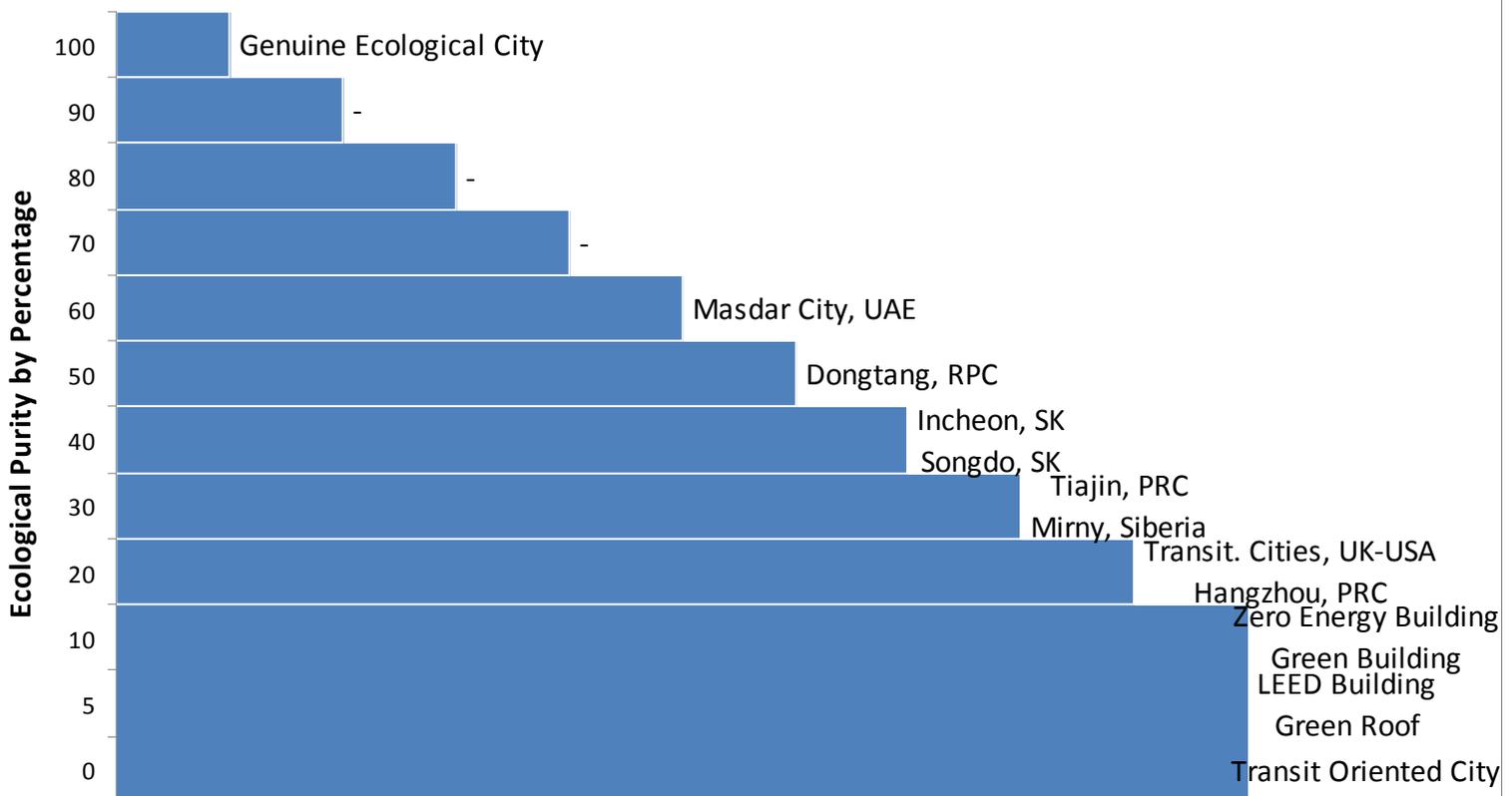
# NOT ALL ECO-CITIES ARE THE SAME

## Eco-cities Defined

There are a lot of names and ideas tossed around as to what is an eco-city. Many people equate eco-cities with sustainable cities, BUT they are not. The word eco-city is an abbreviation from ecology and city. Ecology is about the reality of Nature and the infinite relationships of the natural environment that exists with human co-existing in Nature. The word sustainable means to maintain or prolong in a similar manner. It would seem that the basic concepts known by the public need to be re-examined.

It is important to remember that a city is much more than a few buildings that are energy efficient. Eco-cities are a complete design package that exams every element of human interaction with Nature and position that interaction in way that humans have much less impact on the activities of other life forms. This re-orientation is mandatory to re-align Nature into Balance. Remember, Nature is always very to balance like a pendulum making very short swings. It is the involvement of human beings creating an un-natural environment that has thrown Nature into gigantic pendulum swings. We must now examine what we have done to upset Nature and how we can bring back into harmony.

## Ecological Level of Cities



**LEED** (Leadership in Energy & Environmental Design) is an internationally recognized green building certification system, providing third-party verification that a building or community was designed and built using strategies intended to improve performance in metrics such as energy savings, water efficiency, CO<sub>2</sub> emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts.

LEED is intended to provide building owners and operators a concise framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions. Since its inception in 1998, the U.S. Green Building Council has grown to encompass more than 14,000 projects in the United States and 30 countries covering 1.062 billion square feet (99 km<sup>2</sup>) of development area.

LEED has grown from one standard for new construction to a comprehensive system of six standards covering all aspects of the development and construction process. LEED was created to accomplish the following:

- Define "green building" by establishing a common standard of measurement
- Promote integrated, whole-building design practices
- Recognize environmental leadership in the building industry
- Stimulate green competition
- Raise consumer awareness of green building benefits
- Transform the building market

Unfortunately the LEED Program solves only one small problem in the complex ecological picture of why Greenhouse Gases are fatally damaging our environment. Primarily centered on commercial buildings, the improvements legislated by LEED make only a 0.5% correction in the scope of all the problems. It is a simplistic approach that does not look at all the parameters that creating the ecological wave of immanent catastrophe. Rather it is a distraction that makes people think that resolving this problem will solve all the ecological problems. Valuable time is being lost upgrading buildings when there are far more urgent problems that need addressing.

**Green building** (also known as **green construction** or **sustainable building**) is the practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's life-cycle: from site selection to design, construction, operation, maintenance, renovation, and demolition. This practice expands and complements the classical building design concerns of economy, utility, durability, and comfort.

Although new technologies are constantly being developed to complement current practices in creating greener structures, the common objective is that green buildings are

designed to reduce the overall impact of the built environment on human health and the natural environment by:

- Efficiently using energy, water, and other resources
- Protecting occupant health and improving employee productivity
- Reducing waste, pollution and environmental degradation<sup>[1]</sup>

Green buildings by their own definition reduce overall impact on human health and the environment. However, reducing impact of 1% of buildings in the world by reducing their bloated energy consumption does not solve the problem of human impact on the Earth. This is a very simplistic approach that DOES NOT understand the intricacies of ecology, Nature or human health. It is merely a distraction of city development to make people think they are doing something useful when they are not.

**Zero-Energy Buildings** are similar to a LEED in that they focus on energy reduction and incorporate one or more renewable energy generators into the building to offset energy consumption. There many inherent problems with this system that they do not discuss.

- Supplemental systems like photo-voltaics wear out after 15-20 years. The return on investment is barely paid off when a new system must be installed
- There is a huge ecological impact in fabrication and disposal of PV
- PV works best near the Equator where there is little cloud cover
- Wind generators are intermittent in generation due to wind variation and get blocked by other buildings
- Building consumption differs from electric generation requiring either an energy storage system or connection to the Grid.

**Transit-Oriented Development** is another urban concept that deals with mass transit as a theme, attempting to eliminate “Sprawl”. This is oriented around a mixed-use residential or commercial area while individual building may or may not be “green”. In this system, community pedestrian movement interacts with the public transit system. Communities are typically small with destinations being no more than 400-500 meters from the transit station. These micro communities are still low density with cars being used as auxiliary transportation. There is no self sufficiency or self-sustainability presumed in these plans. However, the concept can be incorporated into grander ecological scheme as one of the elements.

**Transition Cities** are an attempt to transform an existing neighborhood or village into a sustainable town. This mostly involves transforming suburban backyards and parks into permanent bed food gardens. It may even involve converting household plumbing into grey water re-use of water if there is a shortage. An alternative may involve collection of rainwater run-off. It is noble attempt to convert what is at-hand, but does not solve most of the major ecological problems created by humans during the last 200 years.

**Roof Top Gardens** was a concept made popular by Architect William McDonough to eliminate solar heat absorption and give occupants a park-like setting to relax. The concept does reduce heat levels, but can be structurally dangerous to the building. Roof

loads were never designed for the additional water and soil that are placed there. To provide the illusion of green roofs, artificial turf is used. That reduces weight load on the structure, but does not create an ecological environment.

Some people believe that entire food production systems can be integrated into this concept, but this is incorrect. It takes over 500 square feet of garden per person in a year round warm environment to provide sufficient food requirements. This does not include any meat consumption.

Several other environmental concepts have been pursued to reverse Global Warming and Greenhouse Gas generation. As stated earlier, simple environmental individual solutions do not solve the issues that are ecologically damaging the Earth. These two concepts relate to individual transportation.

## **Other Environmental Attempts**

**Bio-Fuels** are an attempt to produce gasoline locally without importation and the loss the money. Bio-fuels are considered environmentally advantageous because their combustion has less CO<sub>2</sub> emission. That is good, however there are many disadvantages.

- Photosynthetic energy enhancement is only 10% increase while using huge amounts of hydro-carbon based fertilizer, pesticides, farm implement energy use, refinery energy use and transportation energy use for delivery.
- Loss of organic materials from the soil reducing soil quality
- Consumption of over 1000 gallons of water to make 1 gallon of bio-fuel
- Diversion of food production for bio-fuel, raising cost of food

**Hybrid Cars** do not solve any problems. They predominately use gasoline. Sometimes their gasoline consumption is greater than simpler, smaller cars.

**Electric Cars** use energy created from coal fired electric generators that pollute the environment. The efficiency of electric generation and transmission on the Grid is under 25%. Air pollution is created in long distance, but with a single atmosphere we breathe the pollution and see the effects of GHG Global Warming.

**Carbon Trading** is a game like the game Monopoly. It is artificial and does very little to stop the environmental problems that are causing Global Warming and Greenhouse Gases. It places a cost for GHG generation that gets passed on to the consumer. It does NOTHING to actually stop the GHG generation. The fee or tax is collected in the First World then is given to non-GHG generators in the Third World for not generating GHG. It is like welfare but does not stop the generation of GHG it makes it more expensive. Theoretically increased costs will reduce consumption, but that seldom happens. The minute Second and Third World Countries start emulating First World GHG consumers wanting the advantages of the energy slave units that generate GHG then the entire system will fail.

The other problems with this system is that it only deals with CO2 generation which is only one of the ecological problems humans are subject Nature to.

### **Modern Cities are Anti-Nature**

Human life has bio-engineered itself away from the Reality of Nature. By removing our lifestyle patterns from the survival of hunter/gatherer activities through the use of agriculture we have changed Natural Patterns. Hunter/gatherers utilize more plants and animals so that their bodies receive greater nutrient diversity than what we receive today on our limited diets. Secondly a diverse diet and food planting reduces our dependency on one or two crops which endangers our survival if there is plant failure. Those failures can occur by excessive heat, lack of water, pest resistance to sprays or microbial disease.

Cities represent a concentration of humanity. The more humans there are in one place (larger cities) the more that realm moves away from naturalness. Large mega-cities of comprised of millions of humans are an abomination of Nature and a catastrophe waiting to happen. There is no self sufficiency. Long supply lines of water, food and energy must be imported. Break the supply of any of these items and there is collapse.

Agriculture was the start of this change away from natural patterns. Altering the timing of harvest through selection and plant breeding has resulted in a greater food harvest range for humans, but also for insects. Mono-cropping meant that specific plants that produced food humans preferred would also be available in large quantities for insects and disease that also preferred these plants. As the plants were selected for greater size and food production more nutrients and carbon-based organic matter were removed. Our 6,000 years of human bio-engineering has resulted in soil destruction in many of these original areas. Where rivers flood, soil nutrients are replenished, but in many areas away from river nourishment the soils are used for 10 -20 years and then left abandoned.

Many cities have unreliable water sources. When cities rely upon wells for their water they are facing certain doom. Underground aquifers that feed the wells eventually dry up or the water shifts to deeper aquifers. If they rely upon river water they are also subject to even greater seasonality. We are already observing how Global Warming is changing glacial storage of water. When the glaciers shrink they have less water to release late in the year. Instead of a 12 month supply of water in the river it may only last 8 months. That leaves four months with little or no water. In addition, rainwater that would have stored in glaciers may come right off the mountain and produce flooding.

Energy is the life blood of cities. Cities have expanded exponentially in the last 60 years. Their rapid growth has occurred through low density sprawl accompanied by massive road construction. Distances that are impossible to traverse by foot require the use of a car. When fuel is plentiful this is not such a problem. However, we are now looking at a PEAK OIL situation that is causing fuel prices to increase and may create shortages in the near future. What happens to these expanded cities and the life line of food and water that energy transports? When the city's life blood disappears, so does the city.

Physically cities have become “Asphalt Jungles”. With buildings facing on sidewalks that border the streets there is no soil, grass or plants left. Only an occasional tree in a planter or small park gives humans any kind of connection to Nature. When it rains the water quickly disappears down a slot in the road. We go to supermarkets and buy some cut and wrapped produce, but never see the plant. Meat is not something that is alive and grown from plants. Rather it is a chunk of butchered flesh wrapped in plastic. Worse yet is food from boxes or cans with a pretty pictured label on the front and a list of chemical ingredients on the back. City inhabitants work inside during the day and go home at night never seeing the sun. For many people this is their life. Remove any part of this pattern and the people die!

If a city moves back toward a more natural relationship with life these survival problems will disappear. Cities and their inhabitants do not need to be so removed and isolated from Nature. The pendulum can swing back from total un-naturalness to one that integrates more closely with Nature.

## **Harmonizing Humans with Nature**

Imagine a world where humans live in harmony with Nature. What would it be like?

- We won't pollute the air
- We won't plow the soil
- We won't extract any more oil out of the ground
- We will greatly reduce any more mining and recycle tailings
- We would limit coal extraction to a minimum from deep cavity mines, but not open pits.
- We won't deplete underground water aquifers
- We won't cut anymore trees
- We will plant millions of trees under supervision of restoration ecologists
- We won't contaminate any more soil with chemicals
- We will greatly reduce irrigation of soils
- We will not pollute rivers, lakes or the oceans
- We will respect the lives of all plants and animals
- We will continue to study other life forms to learn their secrets of life
- We will continue to identify new species of life
- We will actively reduce the human population to give more space to other life.
- We will not kill other humans
- We will kill life only for the food we need
- We will derive new medicines from Nature
- We will live in structures that minimize negative human impact on Nature
- We will reduce consumption of non-renewable resources
- We will attempt to recycle already used materials

## **Sustainability with a real Eco-City**

Let's revisit the classic and generally accepted definition of "Sustainability" as created by the Brundtland Commission in 1982 and approved by the United Nation's General Assembly in 1983.

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

A true eco-city allows for current inhabitants to live an excellent life with food, shelter, clothing, water, education and cheerful companionship of others; while reducing human interaction and creating ecological balance of the adjacent neighboring and long distance environments.

## **Why Have Land and Food Production**

Land will be a legacy. Land has been misrepresented. For over 4,000 years it has been sold or traded as a property. Wealth was created from the land, when actually wealth can only be built from human labor. Land needs to be retired from further trade and transfer. Land can only be considered God's creation.

Part of the design for an eco-city is to be self-sufficient in food production. This new system of living invites abundance. We will never be short on food of many varieties. Relying upon long distance food production has high energy costs in transportation, packaging and production techniques that create artificial food. It is better to watch to growth of food since it is so much a part of human health. Food will be one of our exports. We will use healthy food to heal people and the environment.

### **Perfect City and System to Harmonize**

The ARC City and the In-Harmony System were created using the principals of Systems Design Management. Using this process we analyzed the problems facing an ecological city of the future (requiring the parametric criteria to define and understand the holistic relationship of the hypothetical damaged environment); next we applied systems engineering to define a series of solutions that solves all or most of the identified problems; next we applied system architecture in a conceptual model that defines the system components containing all the solutions, the externally visible properties of those components, the relationships between them, and provides a plan from which products can be procured, and systems developed, that will work together to implement the overall system.

As such we believe the In-Harmony System to currently be the one and only ecological solution to humans co-habiting the Earth in a more harmonious way. For any other solutions to appear it will be necessary for the system design practitioner to have a similar background yet superior skill level. This combination will be extremely difficult to find.

### **Features an Eco-City Should Have**

One of the reasons that complete Ecological Cities have never been achieved is due to the absence of System Design Analysis. This design process utilizes holistic thought which emulates Nature. Most people have been trained in areas of specialized thought or paradigms (separation) but they never learn how to integrate multiple realities into a new matrix. It is due to this lack of attaining a multi-disciplinary training that inhibits most eco-city designers from understanding all the processes needed to create a complex new reality.

Furthermore, eco-city designers must have a thorough understanding of ecology which is a complicated subject that requires the knowledge of the multiple levels of natural interaction in all plant and animal life to their surroundings. In addition, it also requires sensitivity to the philosophy that all Life is Sacred and must be protected no matter what its utilitarian value.

Humans have been given unique skills and powers never before realized by any other Earth species. Our greatest powers have been that of awareness to cognitively understand the Natural Order and the ability to bio-engineer the Reality around us (a right and left brain duality). Unfortunately we have not utilized both powers equally. We have modified our realm which is predominately based on left-brain linear thinking. Humans have been creating an artificial reality for the last 6,000 years that is increasingly moving

away from Nature. We must now change our focus to allow our Pendulum of Reality to return to greater proximity with Nature.

Based on these new understandings, we are designing this eco-city with the following features and design elements:

- Water Collection & Storage Systems
- Adjacent Food Production & Storage
- Renewable Energy Generation & Storage
- Recycling Systems for Water & Sewage
- Landscape & Greenery throughout
- Recreational Activities Inside & Outside
- Non-polluting Mass Transit Systems
- Vertical Lifestyle based on use of elevators (low energy usage)
- Energy efficient, futuristic lighting
- VAC controlled & purified HVAC with geothermal heat sinks
- Artistic Spatial Design – these design principles are a necessary part of creating form and spatial definition: order, beauty, unity, harmony, texture, context  
scale, proportion, symmetry, balance, rhythm, contrast
- Activities and work similar to present Civilization
- Community Laundry Systems using recycled, purified water
- Community Food Preparation to eliminate Solid Waste

### **Increasing Biodiversity into our Reality**

As the dominant large species on land, humans must be creating biodiversity not eliminating it. Evolution has taught us that the more complex an organism is, the more it requires a complex support system. Being the top species is like climbing to the top of a mountain. It is best to have a broad plateau to exist that provides a stabile reality. The edges are constantly eroding away. It is much better to have a large plateau of diversity than a precarious point with little diversity for support. The supporting life is also constantly evolving. If we depend on only a few sources for our existence, they will invariably be altered and removed. So the more Biodiversity we surround ourselves with, the safer our existence.

Our food system has a major problem with Biodiversity. There are over 70 different plants that are used by indigenous people around the world to provide food for their diet. Yet, we have narrowed our food system down to 5 major foods: corn, rice, wheat, potatoes & soybeans. Not only have we reduced the sub-species, but we are reducing or eliminating gene pools of other varieties with genetically modified plants that have no genetic history to resist periodic annihilation. We have made these genetic modifications to improve production efficiency and profits. The current modern food system could easily have 30-40% worldwide loss (from corn devastation) within one or two year's time.

Not only have we intentionally narrowed our food biodiversity we have altered our food production techniques with Green Revolution techniques so that we isolate these

individual plant varieties into mono-cropped fields covering thousands of square miles. This leaves them extremely vulnerable to both bird, insect and microbial pests. This vulnerability is counteracted by use of poisons to ward off natural biodiversity that wants to feed on these huge unnatural mono-crops.

We have removed these specialized plant varieties from their natural source of nourishment within the soil. Modern farming considers the soil as a lifeless medium for plant roots to be anchored, water to be osmotically absorbed into the roots with chemical fertilizers dissolved into solution. Mechanized farming tills the soil so that porous structure is destroyed preventing water translocation and destruction of the most populous living environment on Earth. These specialized artificial food varieties have no connection to traditional plant growth and rely upon chemicals to stimulate tissue growth much the same as human athletes use anabolic steroids to produce muscle tissue growth.

To add to the food problem are the methods and technology of modern meat and dairy production. Animals are raised as commodities. They are genetically bred for fast tissue growth and feed genetically modified corn and soybeans. Two year growth cycles are reduced to 6-8 months just to generate higher profits. Animals are raised with no physical movement and must stand in their own excrement all day. They are fed and injected with hormones and antibiotics so they will not die pre-maturely. Their lives are so timed that there is a two week window to slaughter them before they fall over dead. Dairy cows are injected with milk forming hormones so they produce twice as much milk per day per animal. They are in constant pain from having udders so large they sometimes touch the ground. Chickens are kept in an artificial environment under electric lights so that they can be tricked into 2-12 hours days of laying eggs instead of 1-24 hour cycle, thus doubling egg production. All of this for the sake of profit and feeding a human population that has doubled its demand for cheap meat and dairy.

These forms of industrial food production are creating new human diseases unknown a hundred years ago. Cancers, heart attacks, strokes, diabetes and other forms of body degeneration are all relatively new and are occurring in quantities never before seen. Somewhere between 20-30 years after modern food production practices are introduced into an existing food production culture these diseases start to appear.

The human body has evolved over a million years. Food supplies dictated body evolution based on blood type:

- Blood group **O** is believed to be *the hunter*, the earliest human blood group. Originating 30,000 years ago, this blood group eat a higher protein diet
- Blood group **A** is called *the cultivator* dating back 20,000 years ago with the dawn of agriculture. The diet uses vegetarian and is free of red meat.
- Blood group **B** is *the nomad* has a strong immune system and a flexible digestive system. This 10,000 year old group is the only one who thrives on dairy products.
- Blood group **AB** is *the enigma* is less than 1,000 years old. They are a hybrid between blood types A and B utilizing both diets.

In all of the above types, the greater the food biodiversity, the better were the survival chances. It is best to mix foods based on digestive patterns. Biodiversity provides high variety of food crops, livestock, forestry, and fish; which are all important food sources of human species. A wide range of species provides many thousands of food products, such as, fruits, vegetables, nuts, meat coming from genetically diverse sources. Foods grown in biodiverse organic environments have been found to contain more vitamins and nutrients. Naturally produced food, high in nutrients is much more filling than industrial grown food. It is necessary to eat twice as much commercially grown food to achieve satiation which results in over-eating, obesity and nutrient deficiencies in people.

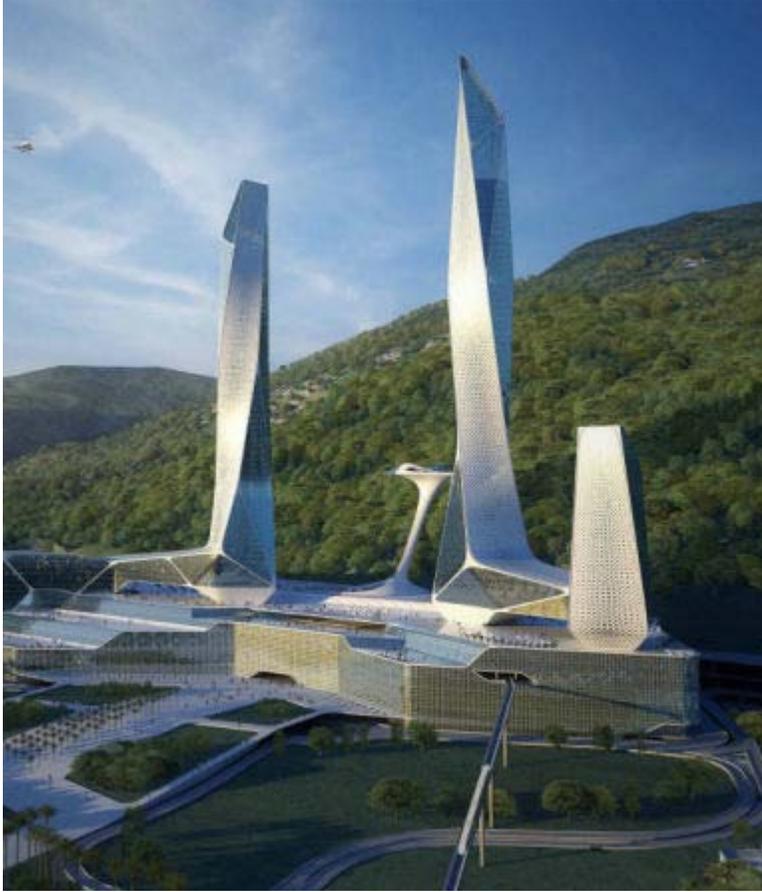
Relying on too few species of crops and animals is a threat to the survival of the Human Race. The Great Irish Potato Famine occurred when potatoes were introduced into Ireland and became the major food source of most of the Irish people. The wind-borne Potato blight fungus spread throughout the country in 1845-1847, causing almost complete failure of the potato crop. It is estimated that 1 million people died of starvation, cholera and typhoid.

Organic permanent-bed gardening creates a wide range of biologically diverse populations in natural ecosystems. In agricultural ecosystems they maintain essential ecological functions which are necessary for the production of food. This is demonstrated with nutrient cycling, decomposition of organic matter, eroded or degraded soil rehabilitation, pest and disease regulation, maintaining water quality, and pollination. Maintaining this diversity of species and increasing it with biodiverse plant strains found in other parts of the World will widen the diversity of food source. By enhancing ecosystem functions there will be increased nutrient availability, improved water use and soil structure, and natural control of pests.

## **Images of other cities that are not Ecological**



**Auroville, India** – This is a planned city inaugurated in 1968 to be a spiritual community. It was originally designed to house 50,000 people with adjacent food gardens and renewable energy on the 20 hectare site. This ratio of people to land would have worked very well to create sustainability. However uncontrolled development has led to most of the food production land being occupied by retail stores, offices and workshops. Original plans for a self-sustaining community became altered as development kept taking more and more land.



**Penang Global City Center, Asymptote Arch**

This 256 acre development is centered on the idea of creating a new and powerful image for the city of Penang Malaysia. The complex includes two iconic, sixty-story towers housing luxury residential units and five-star hotels, the Penang Performing Arts Center, a high-end retail and entertainment complex, an observatory, a world-class convention center and a vast public arena in the form of a plinth that serves as an entrance to the PGCC and connects it to the city beyond.



### **Dontang Eco-City, Shanghai China**

This project was cancelled! It was brandished as an eco-city, but was not even a sustainable city. The ultimate population of 350,000 people would exceed available land even for a vegetarian lifestyle and would not support animal production. The residential structures were designed as medium density, however the ratio of people to land would dictate that higher density living was needed to allow for more open land space. It did not have a safe water supply. It was on an island the size of Manhattan at the delta of the Yellow River. It is in the middle of a “dead zone” of life on the river. People would live in the middle of a river contaminated with toxic industrial waste and agricultural fertilizer runoff. People commute to the mainland with cars, but can walk to all points in the city even though distances make it far (30 minute walk). There is solid waste generation with little ability to recycle. There no water conservation methods. There are tokenery efforts at renewable energy wind generation



**Bahrain WTC Towers, Bahrain U.A.E.**

**The twin towers** have three, 32-yard diameter propellers that supply about 11-15 % of the buildings' energy needs, or about 1100 to 1300 megawatts per year. The shape of the towers creates an airflow tunnel through the buildings for improved energy generation output and each turbine will be suspended on a bridge connecting the buildings. These are beautiful buildings and may have a transit oriented effect. However they are not sustainable and certainly not ecological. They do not have energy storage so all the wind energy created on the building would have to go into the "Grid" and off wind generation relying upon Grid Power.



**Tianjin Eco-City, China.** This city is currently being developed brandished as ecological, but it is not even sustainable. The population of 350,000 people is way too large for the 10 sq. miles of land. It cannot support food production, it draws water from outside. It draws power externally and requires only 15% of it to be renewable. It requires cars for both inter-city and intra city transport. The city is landscape beautifully and is a step in the right direction. It creates a nice reality for the inhabitants to have a mixture of Nature in the midst of their city reality.



**Tianjin Eco-City, China**

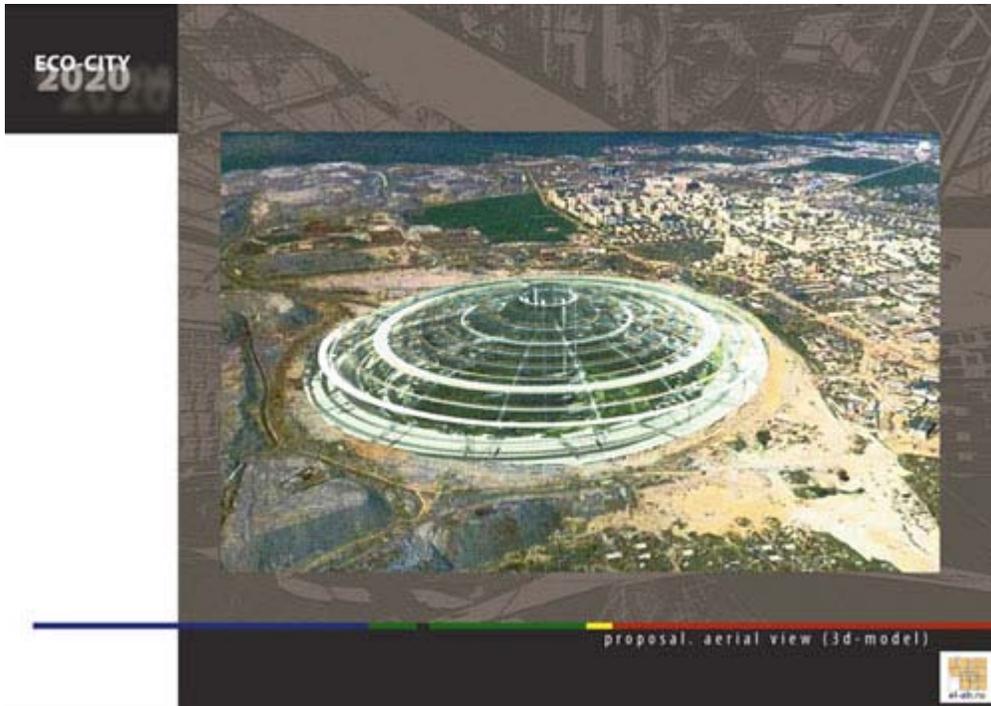


**MBC Korean Headquarters** – This is a beautiful building complex with a lawn. There is little that can be considered sustainable, much less ecological



**Full Moon Bay, Baku Azerbaijan** - Heerim Architects

This project does not claim to be ecological, but it is a beautiful futuristic design with a park included.



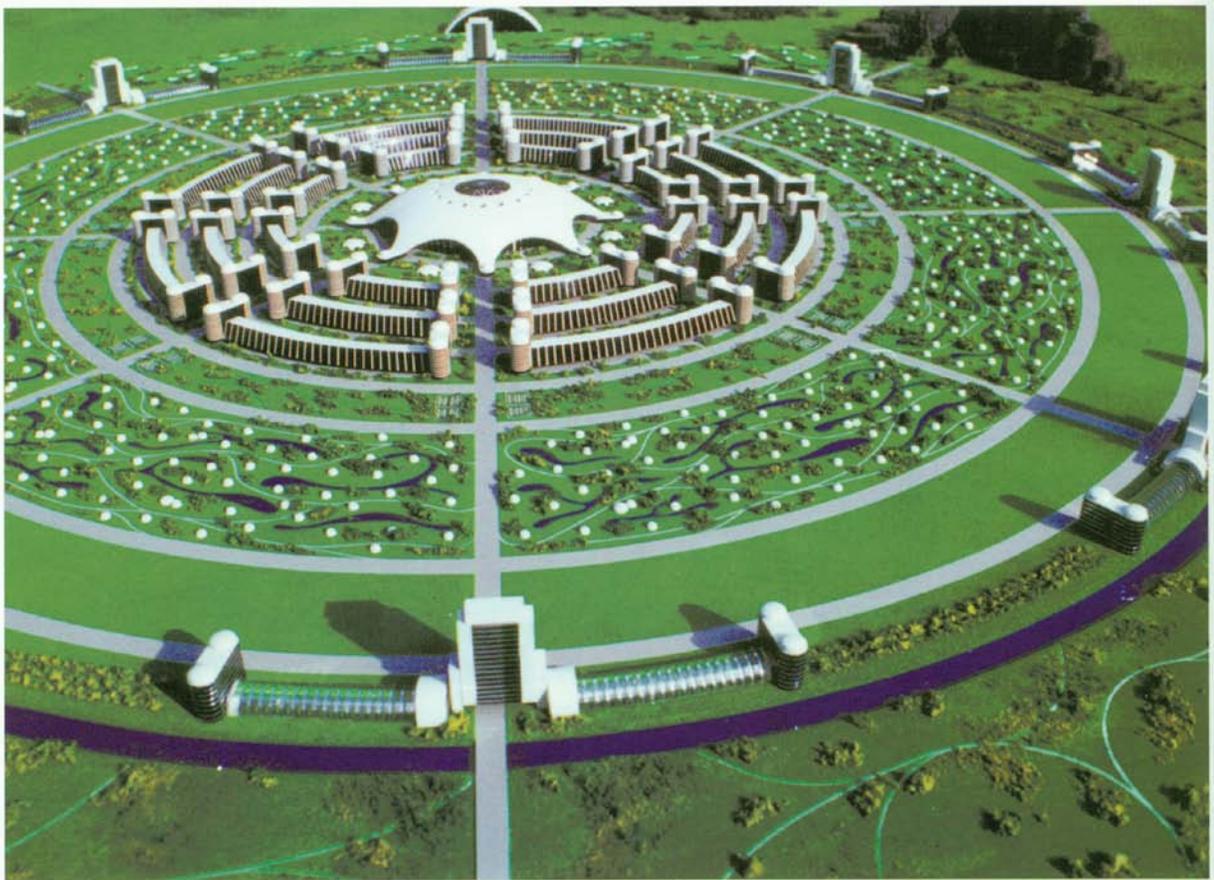
**Eco-city 2020 Mirny, Yakutia, Siberia, Russia** Eco-city designed by AB Elise Architects  
It is built from a retired quarry/crater with a diameter of about a kilometer and a depth of 550 meters. It creates a great amount of open space. It is designed for 100,000 people. As mega-structure and recycler of space it succeeds very well. There is a major problem with heat loss through the clear ceiling. There will be heating in the Siberian winter daytime, but heat loss at night will be dramatic. It will need to have supplemental green house food production of almost 20 square miles before it can achieve any sustainable levels. It will have adverse ecological impact on the adjacent areas.



**Gwanggyo, Korea – MVRDV** This project has little features of an eco-city. It is more green edging instead of concrete or glass. There is a park on the project, but overall it meets very little of the green concept except the towers have plants growing on the balconies.



**Masdar City, Abu Dhabi** – This is a sustainable city, but not an ecological city. It exists because of oil money and oil energy. It uses a PV energy system on the roof which generates power. It has no energy storage so it must rely upon the Grid for nighttime energy supply. It has only partial food production with not enough land to take of all food needs. It obtains all water from desalinization of the Persian Gulf. There is some waste recycling but not enough to deal with solid waste generation. It has some green energy factories that produce photovoltaic electric panels. It requires individual powered “pod car” transportation as it is too large to walk from end to end.



## CIRCULAR CITY

A theoretical planned city by designer Jacque Frescoe. It has a futuristic pattern of living, but is short on common area features; there is no food production or factories. You would need a car or electric cart to move around. Parking could be an issue. There is no provision for waste recycling or energy generation. It has less ecological impact on the adjacent areas than other developments, but it stops short of sustainability and complete sustainable footprint.

## **Facing an Uncertain Future with a Good Eco-City**

No one knows for sure what the Future will bring, not the scientists and certainly not the politicians. We are told that Climate Change may be severe, but what does that mean? So what if it gets a little hotter! We just turn the A/C/ up. We just pay for a little more energy. No problem, we have good jobs and can afford a higher electric bill.

There could be food shortages from something simple as the plant blossoming being one week earlier, but the bees or birds are not there in time. No pollination means no fruit or wheat flowers. Heat can change the rain patterns causing draught or flooding depending on the location. You may turn on your faucet and find there is no water.

Increased heat can also change habitat patterns for mosquitoes and diseases they may carry. This is also true for other insects and diseases that move independent of each other, but in most cases like heat they will expand their territory.

Greenhouse gases may cause increased pollen and mold to be in the air. Breathing these microscopic spores may cause illness or at least discomfort.

Heat may cause glacial ice to melt or slide off of land and crash into the oceans. Depending on how much ice slips, there could be a rise in ocean levels from 4" to 18". This will affect millions who live on the coast and barrier islands.

Energy is one of the key issues for the future. Oil may have 25-35 years before it runs out. What do we do then to power cars? Bio-fuels may only be temporarily used as there are many disadvantages to them that are becoming evident. Electric cars may be working, but where will we get electricity? Coal-fired electric plants are a serious problem. Coal is serious polluter of Green House Gases. For coal powered electrical generation to be cleaned up the technology may cause prices to double from the cost of filtering the smoke. Those costs will also affect transportation costs. Hidden costs of living in the city include water and sewer pumping which also uses electricity.

Living in most modern cities is a tenuous situation. Food, water and energy are brought in long distance. If any one of those items fails for more than a week, most city dwellers will be in big trouble. There are other major problems that we won't detail now because they are quite scary. Needless to say... Cities are fine to live in the good times, but there may be serious survival problems down the road when any services are interrupted.

By definition an eco-city is totally sustainable, while sustainable cities are not ecological. Being self sustaining, a good eco-city is a very safe bet. It is safe for you, your children and your grandchildren. They are great retirement centers where good medical care is only a few away by taking the elevator. The ARC City is designed to last 1,000 years (good long term investment). The building is the strongest building in the world (by design). It can withstand hurricane, tornadoes and earthquakes with no problem. There is a water collection system the will supply pure rainwater for all 25,000 habitants with a 4 month supply kept underground. Food is no problem as we will have both greenhouse

food production 365 days a year, plus outside crops and orchards for at least one crop per year. We will have renewable energy generation equipment for all the building needs (industrial needs will be imported on the Grid). There is an energy storage system that will keep a three month supply on hand.

The Eco-city has all the modern convenience and security of the finest city centers. There is public transit to other cities. Intra-city transit is all done by foot. The city goes up instead of out, with over 50 high speed, energy efficient elevators going to residential and office areas. Being only 400 meters in diameter, it goes up 38 stories from the main floor, with over 4 million square feet of common area for shopping, restaurants, schools, churches, recreation and fitness. There is office space on the top 5 floors and over 8 million square feet of high bay factories and workshops underground. Most importantly the city is very safe. Persons entering the city by train all go through airport quality screening. Residential floors all have security so that only people living on that floor and their approved guests are present. A security wall goes all the way around the perimeter so that no one enters or leaves the 6,000 acre grounds without going through a security portal. We anticipate zero crime and will tolerate nothing else.