

# Index

Introduction . . . . .	page 2
Energy Bibliography and Websites .	page 3
The Short Fossil Energy Age . . . . .	page 4
Our Addiction to Oil . . . . .	page 5
Ecological Devastation . . . . .	page 7
Population Bibliography . . . . .	page 8
Ecological Devastation Bibliography	page 8
Population and Exponential Growth	page 9
The Survival Plan. . . . .	page 10
Education . . . . .	page 11
Conservation . . . . .	page 11
Delusions (that will not save us) . .	page 12
Negative Population Growth (the ultimate issue)	page 13
Non-Fossil Energy Sources . . . . .	page 14
Action on a National Level . . . . .	page 15
The Low-Energy Community . . . .	page 17
Personal Action . . . . .	page 18
Graphic Summary . . . . .	page 19

# Introduction

Dear Reader,

May 2007

**This document attempts to summarize the complex, interwoven, imminent multiple crisis facing civilization.**

With a better understanding of the urgency of diverse but interrelated issues of finite energy, population-growth, and ecological concerns; hopefully, realistic solutions can be implemented in time for survival. Many disparate (desperate) voices are telling us that we are, in many ways, at a tipping-point in history. When combined, the facts, synergism, and conclusions are undeniable.

Modern civilization is already slipping over a cliff. The information presented herein is accepted math, science, and history. The only hope for a successful outcome is for many individuals to readily understand the seriousness of our situation and to disseminate this message as quickly and widely as possible. Action on a personal and national level is urgently needed. Counter argument, denial, defeatism, and/or disinterest waste valuable time and focus.

This 20-page summary is an attempt to subsume the vast information sources including books, web sites, and news articles. By combining everything into an easily reproducible form, hopefully, a large enough number of concerned readers will extend and expand the chain of communication into a ground swell of public activism ... especially considering the short time available to affect the outcome. Steadily escalating costs of energy and food are now causing concern among main-stream Americans.

**PLEASE GET INVOLVED. This movement is non-religious and non-political. It is the best hope for our future.**

There is no explicit author for this booklet. There is no copyright or ISBN number. You, as an integral link in a rapidly growing chain of communication, must provide the reproduction and distribution functions (marketing is everything!). If each recipient were to reach just five additional new active readers and conveyors of this document each month, after twelve months 470 million people would be aware of the crisis and a survival plan. This booklet can be reproduced for about 30 cents. It can be mailed with a tape closure (not stapled) for 39 cents. It can be left in a convenience store or public place like any free "mini tab".

## The Energy Crisis: Bibliography and Web Sites

Following are a few of the contemporary works, which explain energy and expand and validate the concept of Peak Oil. This theory was proposed in the 1950's by the late M.K. Hubbert, hence the term "Hubbert's Peak" for the apex of oil production. Oil provides about 40% of our total energy.

### **Books:** (all available on Amazon.com and in bookstores)

- Campbell, C.J., *The Coming Oil Crisis*, Multi-Science, 1997 - This is the basic original book defining the peak oil crisis.
- Campbell, C.J., *The Essence of the Oil and Gas Depletion*, 2003
- Deffeyes, K., *Hubbert's Peak*, Princeton University Press, 2001
- Deffeyes, K., *Beyond Oil*, Hill and Wang, 2005
- Heinberg, R., *The Party's Over*, New Society Publishers, 2003
- Heinberg, R., *Powerdown*, New Society Publishers, 2004
- Howe, J.G., *The End of Fossil Energy, Third Ed.*, McIntire Publishing, 2006
- Simmons, M., *Twilight in the Desert*, Wiley and Sons, 2005
- Savinar, M., *The Oil Age is Over*, Morris Publishing, 2005
- Pfeiffer, D.A., *The End of the Oil Age*, self-published, 2004
- Darley, J., *High Noon for Natural Gas*, Chelsea Green, 2004
- Kunstler, J.H., *The Long Emergency*, Atlantic Monthly, 2005
- Cooke, R., *Oil, Jihad and Destiny*, wizwire.com, 2004

### **Web Sites:** (Start at the top and link ad infinitum)

- asponews.org – Association for the Study of Peak Oil and Gas
- 321energy.com – hourly market price of energies plus editorials
- energybulletin.net – same as above
- theoildrum.com – the daily beat by concerned experts
- peakoil.net and peakoil.ie – basic UK sites
- peakoilcrisis.com – another excellent starting point
- aspo-usa.org - U.S. branch of ASPO
- odac-info.org – UK source of world activity
- postcarbon.org – comprehensive US site
- oilcrash.com – the same concerns in New Zealand
- energyskeptic.com – all related issues including "Peak Soil"
- mcintirepublishing.com/energybook – honest answers
- bartlett.house.gov – Congressman Bartlett's site for peak oil action
- greatchange.org – an original site
- dieoff.com – the pessimistic view of the Oil Age
- oilcrisis.com – very comprehensive long-standing site
- lifeaftertheoilcrash.net – a young lawyer's realistic assessment
- powerswitch.org.uk – dedicated to raising awareness
- wolfatthedoor.org.uk – more UK concerns
- drydipstick.com – a peak oil mega-directory
- peakoilaction.org – working to raise awareness
- oilcrashmovie.com – new for 2006 with audio
- globalpublicmedia.com – public broadcasting of peak oil
- petropeak.com – straight talk on all petro-issues
- survivingpeakoil.com – delivers as promised
- financialsense.com – recent business viewpoint about oil

## The Short Fossil Energy Age

**The Industrialized World is just concluding a 150 year party provisioned by a seemingly unlimited supply of finite fossil energy; oil, natural gas, and coal. As with any living species with a surplus of food-producing resources, population increased exponentially in lock-step with consumption resulting in the concurrent devastation of all world ecosystems.**

By 2005, it became obvious that world oil production could not continue to satisfy rapidly increasing demand. About 75 million barrels per day of conventional oil (one billion barrels every 13 days) has not been exceeded into 2007. The term “Peak Oil”, long predicted by oil geologists, now appears to be fact and no longer theory. Rapidly rising oil and gasoline prices have sparked public concern and made energy a mainstream topic. This, in spite of attempts by Exxon-Mobil, and others in the industry, to convince us that we still have two trillion barrels of conventional oil left but with one trillion yet to be found somewhere. Discovery peaked in 1965. We are now consuming over six barrels of oil for every new barrel discovered.

Closely following the imminent depletion of oil (40% of our total energy) are natural gas (23%) and coal (23%). Natural gas reserves are isolated and limited. Precarious pipelines and complex LNG shipping further impede smooth world market supply lines. Coal was thought to be more plentiful but incurs a high cost in energy and ecological impact to mine. In 2007, a new study by E.W.G. (Energy Watch Group) in Germany, titled *Coal: Resources and Future Production* claims that world coal reserves are much less than previously estimated. Coal production, primarily from two countries; U.S. and China is also expected to peak in about 20 years.

In addition, because of the long carbon backbone in the solid coal molecule, huge amounts of CO<sub>2</sub> as well as other pollutants are released during burning or conversion into “clean” coal or synthetic liquid fuels. Together, the consumption of the three fossil fuels releases most of the 13 billion tons of CO<sub>2</sub> added to the atmosphere each year. Extensive forest burning contributes most of the balance.

Clearly, the handwriting is on the wall. Our short, high-energy Industrialized Age, made possible by fossil energy, is stretched to the limit and will clearly take modern civilization down with it unless we take drastic action immediately. (See the back cover for a visual summary.)

Page 3 lists just a few of the rapidly expanding number of books and web sites dealing with fossil energy. Peak Oil is the publically visible tipping point, which sheds light on the other two intertwined parts of the triple-crisis of civilization: population-growth and eco-devastation.

## Our Addiction to Oil

(This and the following page are a summary of the many books and web sites listed on page 3.)

**Convenient and high-energy content oil has infiltrated into every corner of modern life. In the U.S., with one-twentieth of the world's population, we presently consume over 20 million barrels every day, which is about one-fourth of the total world production. Of this, one-half (400 million gallons per day) is used for gasoline alone. Oil runs our whole economy. It makes and transports the food we eat. It puts our planes into the air and moves our military. It is the source for plastics, chemicals, rubber, asphalt for our roads, and thousands of other products we take for granted and have come to depend on in the last 150 years.**

What will we do as the short Oil Age runs down? Each gallon, equals the energy of three strong people working for a week yet today we use it with no regard for the inevitable shortfall and our children's future. What will run our snow plows or power our trains, our 18-wheelers, and fuel our race cars a few years from now? How will we heat our homes next winter as the price of heating oil climbs towards \$3.00 per gallon? Clearly we are confronted by a dilemma of unprecedented magnitude.

To make matters more urgent, parts of the developing world (China and India) are scrambling to catch a piece of the fleeting Oil Age. Because of their lower labor costs, we send our dollars for their products, which allows them to outbid us in the world oil market. This imbalance of payments is exacerbated by the direct flow of dollars to oil-producing countries of which many don't like their dependency on us as their dominant customer. Most oil-producing countries are now experiencing a decrease in annual production. They are over their peak. Should they sell now at a good profit or save diminishing reserves as prices climb even higher? The record profits recorded by shareholder and nationalized oil companies are more an indication of dwindling supply than greed. Just as with increased demand for real estate, or any finite commodity, prices soar and the owner benefits. The economists still argue that the higher price will encourage exploration. Prices will then drop assuming more is found. But, 2005 was a year of record-low discovery in spite of record-high drilling efforts. The old giant fields in Mexico, Alaska, Saudi Arabia, Kuwait, and the North Sea are all in decline. Many smaller new fields can no longer make up the shortfall.

## Our Addiction To Oil (*cont.*)

**By 2005, the first indications of peak oil awareness (headlined by the title of this page from President Bush in his 2006 State of the Union Address), started appearing in Washington. On Dec. 8, 2005, the House Energy and Commerce Subcommittee on energy held its first full-scale congressional hearing on peak oil. A bipartisan caucus co-chaired by Rep. Roscoe Bartlett (R-Maryland) and Rep. Tom Udall (D-New Mexico) along with 16 other congressmen prepared resolution 507 beginning with the following paragraph:**

*Expressing the sense of the House of Representatives that the United States, in collaboration with other international allies, should establish an energy project with the magnitude, creativity, and sense of urgency that was incorporated in the 'Man on the Moon' project to address the inevitable challenges of 'Peak Oil'. (See [www.energycommerce.house.gov/108hearing](http://www.energycommerce.house.gov/108hearing) for complete transcript.)*

On March 29, 2007, the GAO (General Accounting Office) issued an 83 page report (GAO-07-283) titled, *Crude Oil, Uncertainty About Future Oil Supply Makes it Important to Develop a Strategy for Addressing a Peak and Decline in Oil Production*.

Each time the price of oil and gas ratchets a little higher, the mainstream media gives sporadic attention. Unfortunately, the public hears a blend of obfuscation and short-term excuses such as inadequate refinery capacity or terrorist activity in producer countries. (See "We Were Warned" on CNN, March 18 and 19, 2006.) As usual, media coverage is "balanced" by conflicting optimism. See page 12 for the usual delusions. Very rarely is the concept mentioned that the world just might be running out ... forever! Very few, big business, the media or most elected leaders can fathom or admit that the oil party is about to end. We're now faced with a giant hangover.

As with any addiction or terminal-illness prognosis, the first reaction is denial. How can this be? Our entire economy (and our personal plans) are built on never-ending growth fueled primarily by oil. As reality sets in and logic rears its ugly head, the next response will be ... depression, "gloom and doom". Next, we obviously must begin the weaning process without substitution of hopeless quackery. Finally, a proactive search for honest answers and solutions brings back some optimism even if the best first hope is only to encourage others to join a mass movement of public awareness and action. Remember, our addiction to oil is only a visible part of the other interrelated problems of continued population growth and ecological devastation.

# Ecological Devastation

**The destruction of almost every natural eco-system on the planet is a direct result of population growth exacerbated by fossil energy consumption. Environmentalism has long been a growing concern by itself signaling the spreading collapse of interrelated world systems. History is replete with localized ecological disasters, but now, with the globalization and accelerated resource depletion made possible by fossil fuels, there are no longer isolated areas unscathed by expanding human presence and environmental destruction. Examples:**

- Unsustainable, intensive agriculture leads to top soil loss, erosion, desertification, and lower water tables. The result is decreased per-capita food availability even with increases of fertilizers, irrigation, pesticides, herbicides, and genetically-modified crops designed for mono-culture. All of these were made possible with fossil fuels and are now augmented as we begin growing biofuels.
- Over-hunting, over-grazing, over-fishing. Large parts of the ocean are becoming dead zones. Mass extinction of species is accelerating.
- Extensive deforestation of all parts of the world. For instance, the Brazilian rain forest is being reduced by 10,000 square miles per year primarily for sugar-cane ethanol. The resultant burning contributes to over 20 % of atmospheric CO<sub>2</sub>. In the world, 121,000 square miles are deforested each year.

- Pollution is causing a world-wide health crisis.

In the last 100 years, the consumption of fossil fuels has introduced so much CO<sub>2</sub> into the atmosphere that local climate change and world-wide global warming are becoming apparent. Thirteen billion tons of CO<sub>2</sub> are released into the atmosphere each year. Recent studies show the Arctic ice cap open, Greenland ice is breaking up, and Antarctica is diminishing in size and ice volume. The world may have passed the time for corrective action against possible scenarios as CO<sub>2</sub> climbs towards 400 ppm and China builds a new coal-fired power plant every week. Inferred results follow:

- Ocean level increases measured in meters, whereas only a few inches already cause coastal flooding.
- Possible shut-down of the Atlantic conveyor belt that relies on cold salt-water density to bring a habitable climate to N. Europe.
- Increased water temperature which in some areas now remains above 80 degrees all winter. The number of hurricanes and intensity are increasing.
- Heat waves and drought are more prevalent.
- Glaciers the world over are disappearing.

Humankind, led by the U.S. and China, is only repeating, in a very short period and on a global basis, the sins which caused the longer-term demise of many ancient but more localized civilizations.

## Population and Growth: Bibliography

**Since Malthus 200 years ago, many voices have been telling us that population growth (which in effect drives consumption growth) cannot continue indefinitely, especially when supported by a finite resource base. Nature cruelly restricts further numbers whenever the ceiling of food (energy) is breached. Are humans smarter than yeast which multiply, overshoot their food supply, and then collapse?**

- Malthus, T.A., *On The Principle of Population*, Oxford, 1798  
Ehrlich, P., *The Population Bomb*, Ballantine Books, 1968  
Ehrlich, P., *The Stork and The Plow*, Yale Press, 1995  
Catton, W.R., *Overshoot*, U. of Illinois Press, 1982  
Bartlett, A., *The Essential Exponential*, U. of Nebraska, 2004  
Grant, L., *Too Many People*, Seven Locks, 2000  
Grant, L., *The Collapsing Bubble*, Seven Locks, 2005  
Cohen, J., *How Many People Can The Earth Support?*, Norton, 1995  
Meadows, D., *Limits of Growth: The 30 Year Update*, Chelsea Green, 2004  
Stanton, W., *The Rapid Growth of Human Populations, 1750-2000*, Multi-Science, 2003  
Bergstrom, G., *The Hungry Planet*, MacMillan, 1972

## Ecological Devastation: Bibliography

**These are just a few of the respected authors warning about human devastation of all parts of the delicate earth eco-system. Is anyone listening?**

- Brown, L., *Plan B*, Norton, 2003  
Youngquist, W., *GeoDestinies*, National Book, 1997  
Ponting, C., *A Green History of the World*, Penguin, 1991  
Pimentel, D., *Food, Energy, Society*, University of Colorado, 1996  
Diamond, J., *Collapse*, Viking, 2005  
Gelbspan, R., *Boiling Point*, Perseus, 2004  
Hartmann, T., *The Last Hours of Ancient Sunlight*, Three Rivers, 2004  
Linden, E., *The Winds of Change*, Simon and Schuster, 2006  
Laszio, E. and Seidel P., *Global Survival*, Select Books, 2006  
Wilson, E.O., *The Future of Life*, Knoff, 2003  
Jensen and Draffan, *Strangely Like War*, Chelsea Green, 2003  
Houghton, J., *Global Warming: Complete Briefing*, Cambridge, 2004  
Carroll, J., *Sustainability and Spirituality*, New York Press, 2004  
Kolbert, E., *Field Notes From A Catastrophe*, Bloomsbury, 2006  
Gore, A., *The Earth in Balance*, Houghton, 1992  
Flannery, T., *The Weathermakers*, Grove/Atlantic, 2006  
Lynas, M., *High Tide*, Picador, 2004  
Tamminen, T., *Lives Per Gallon*, Island Press, 2006

## Population and Exponential Growth

**For 90,000 years, our species (Homo sapiens) lived as nomadic hunter-gatherers. Despite potential to increase rapidly, population was harshly limited by the delicate balance between sporadic food supplies, climate, and personal energy for foraging.**

About 10,000 years ago, superior intellect, helped by the additional energy of draft animals, began the food production of grains and animal protein. On this basis, population continued to increase but still at very low levels now limited by arable land availability, crop failure, tribal conflicts, disease, and the usual vagaries of climate. In addition, although not readily obvious, any non-sustainable interference with, or efforts to maximize, carrying capacity invariably resulted in a cut-back in output and localized or widespread famine. Still, there was enough additional food supply through agriculture to allow a higher population level, culture, trading, exploration, cities, organized religion, and, of course, warfare as dissimilar societies interacted at their boundaries.

In 1798, Thomas Malthus proposed that human population, like any biological species, tends to increase exponentially until checked by “misery” caused by finite food and fuel resources. Any successful attempt to mitigate this inherent limitation only allowed additional population to re-establish the same misery at a slightly higher level. The cruel practice of harnessing human labor by slavery also allowed a very few to flourish as others were suppressed.

Then, unanticipated by Malthus, the Industrial Age began based on inventions which utilized vast quantities of previously stored fossil energy. As would be expected, world population then exploded six-fold as the new energy sources as well as continuing advances in technology provided increased food supplies and longer life expectancy. Unchecked population has continued to grow exponentially for the last 150 years always led by a surplus of fossil energy. This is about to change because it is not possible for 7 billion people to survive on this planet without the temporary fossil energy base for food production. There is clearly not enough incoming annual solar energy to make up for finite fossil fuels and crop land lost to eco-devastation. The consensus among population experts (see page 8) is a comfortable, sustainable carrying capacity of a non-fossil-fueled world be limited to about two billion people.

**These and many other respected authors have been warning for years of imminent “peak population”. Few would listen as there has been enough excess food to keep the party going until now ... except for about half of the world, which has already slid over the cliff of diminishing food, ravaged resources, and localized climate change.**

# The Survival Plan

**The first half of this booklet described a critical mass of three crises facing civilization. The second ten pages, starting with education and resource conservation, offer solutions for survival from a personal to a national level.**

**Most Americans have yet to comprehend or even believe the urgency and magnitude of our dilemma, but the long time-span required for correction dictates we must implement action long before the combined crises become overwhelming.**

Some of the actions defined are logical no-brainers. Others are totally contrary to human nature where short-term comfort and profit are far more enticing than long-term survival. Smoking and obesity kill nearly one million Americans a year, yet the obvious corrective actions are less acceptable than the pleasure of the moment. These may be “someone else’s problems” whereas the triple-crisis of fossil-energy depletion, population, and eco-devastation will bring us all down collectively ... you, us, our kids,..everyone. The Titanic has already hit the (peak) iceberg, and we’ll all need lifeboats ... right or left, rich or poor.

The following solutions constitute a collection of concepts available in the references listed on pages 3 and 8. Also included on page 12 is a short summary of common mirages or erroneous answers that only give false hope and waste valuable time. They are either technically wrong, or at cross-purposes; for instance, using valuable food bioenergy for frivolous biofueled transportation.

The proposed solutions just might work only if they become a mass movement of Americans, and hopefully, world citizens. This might be called a “save-civilization movement”. The implication of such a movement is already infiltrating part of the religious community, for instance:

- The book, *Sustainability and Spirituality*, (page 8) defines the synergism of these two concepts combined in a doctrine of ecology and ethics.
- A critical and religiously oriented assessment of the threats posed by climate change was given by Sir John Houghton to the National Association of Evangelicals in March 2005 ([www.creationcare.org](http://www.creationcare.org)) and page 8 for book.
- Protecting Creation is an interfaith program that addresses environmental-justice concerns by the National Council of Churches. ([www.nccecojustice.org](http://www.nccecojustice.org))

## Education

**Civilization has reached a perfect storm of terminal illnesses. There are already serious symptoms which cry out for attention. The earlier the correct diagnosis, the better hope for successful treatment. As stated before, population growth and eco-devastation, as exacerbated by cheap, plentiful energy, have been with us for years, but so far have been problems “somewhere-else” on the planet. Now that peak oil, signaling fossil-energy depletion, is out of the closet, we need a precise understanding of our dilemma.**

The human psyche tends to externalize or ignore facts which are remote, unpleasant or economically impossible to estimate. Although history, math, and science tell us we are traveling an unsustainable path, we continue blindly along, as creatures of habit and pleasure, oblivious to our direction and fate.

We need an honest diagnosis of our collective, synergistic ills and a prognosis which prompts us to action. The respected references offered on pages 3 and 8 form the basis for this short summary and are the best sources for further research. Every individual, parent, teacher, political leader, theologian, and media member should strive to understand the details and magnitude of our pending decline and potential collapse as a civilization. Once the seriousness sinks in, each should alert as many others as possible even if it means only passing along this document. First, we must be aware, before we can begin action including personal planning for survival.

## Conservation

**Once we understand that our life-supporting resources, especially fossil energy, are fast depleting or being destroyed, the first thing we should do, obviously, is conserve what we have left. This is the most difficult pill to swallow as it signals the demise of the fossil-fuel based growth-and-consumption party we’ve been on for longer than any living human memory.**

Initial conservation would actually be easy for us Americans since we presently waste so much. The other industrialized nations like Japan or western Europe use only half as much energy per capita as the U.S.. In the long run, nothing will save us if we don’t also reduce population on a path similar to declining fossil energy. Growth, as we know it, will inevitably reverse.

We need strong leadership to guide us equitably on the journey to a new low-energy, sustainable civilization starting with the honest facts of why we need to ration our precious, remaining, non-renewable, fossil fuels ... we need to end our “addiction to oil”. Read on for the treatment program. Get involved. Make a difference.

# Delusions That Will Not Save Us

(but waste valuable time and dollars while we chase them down)

**With the onset of peak oil and higher energy prices, there is a flurry of new and, in many cases, revived old panaceas. Some have a touch of legitimacy. Some are pure snake oil, some are only a way to profit either from selling books or from ill-directed research grants and tax incentives.**

For instance:

- **Hydrogen:** Now quieting down. Most processed hydrogen comes from natural gas, or if from renewables, it is a terribly inefficient way to use precious non-fossil-sourced electricity. In addition, it is very dangerous and technically-difficult to handle and store in compressed or cryogenic form.
- **Biofuels (exclusive of wood):** Sunlight is very dilute and sporadic. Expecting annual solar energy to replace millions of years of concentrated solar energy stored in fossil fuel is erroneous. As the fossil fuel base (nitrogen fertilizer, diesel fuel, irrigation- energy, etc.) for our food supply winds down, we will need all the biomass energy we can find just to feed ourselves. Also, biofuel production (esp. ethanol from corn) requires about as much fossil energy input as the resultant energy yield. The energy returned on energy invested (EROEI) is too close to unity to be worthwhile. Also intensive monoculture of crop land is not sustainable and biodiesel yields are miniscule.
- **Wood:** Somewhere between dilute annual sunlight-energy and concentrated fossil fuels is wonderful wood. But, it takes 50 to 100 years to grow a reasonable tree. Harvest at a quicker rate only depletes the forest, soils, and ecological balance. This signals the end of a dependent society, is happening the world over, and is exacerbated by increasing population and fossil-fuel powered harvesting equipment. (See *Strangely Like War* on page 8.)
- **There's Plenty Left:** We are now using about 6 barrels of oil (at one billion barrels, worldwide, every 13 days) for every single new barrel discovered. Natural gas is not far behind and can't be shipped overseas except as liquid natural gas (LNG). Coal reserves are suspect (see page 4). Tar sands are plentiful but contribute heavily to eco-devastation and are near an EROEI of unity, especially as natural gas for processing becomes scarce.
- **Efficiency Will Save Us:** Only if we concurrently reduce consumption. In most cases, improved efficiency increases consumption due to increased value and numbers of consumers. ("Jevon's Paradox") In the long run, ultimately we must survive with no fossil energy.
- **Other Sources:** Nuclear, hydro, geothermal, solar, and wind are all legitimate. Except for solar and wind, all are limited by site-availability or, in the case of nuclear, problematic fuel and waste issues. Most remaining energy sources will yield only electricity which is not conducive to easy personal transportation.
- **"Pie In The Sky":** Abiotic oil, nuclear fusion, methyl hydrates, shale oil, perpetual motion machines, etc. None are proved and time is running out.

## Negative Population Growth, The Ultimate Issue

**Population growth cannot continue. This taboo subject is the most critical and toughest challenge to face humankind, a species out of control while ravaging the earth's remaining resources. No other living creatures consciously ponder their future survival ... hence a difficult life as maximized numbers always stretch the limits of their environment and finite food sources. Are we up to the task of controlling our future? We will never get another chance on this planet because the artificial resource base of peak of fossil energy is being depleted forever.**

**Respected population experts (page 8) tell us that even 1.5 children per couple will not start population downward until long after fossil energy declines and our environment is irreversibly destroyed. Only one child per couple will provide the time (50 Years) to mitigate a transition to sustainability. How can this be done?**

1. Again, as delineated on page 15 and 16, we need a massive national commitment, including rationing, education, and economic incentives for things that work, not extra tax credits for additional children. Who would bring a child into a future doomed without negative population growth? Respect the math and science. Less new babies is the only hope for today's children.
2. Hopefully, with the cooperation of all religious and ethnic communities, as well as peer pressure, all methods of contraception will be encouraged. A vasectomy after one child might be much more acceptable than undependable and/or unacceptable birth control. China's unsuccessful attempt at one child per couple led to a large plurality of male children. This obvious infanticide has been documented throughout history even through the Victorian Era.
3. Like any living species, humans gravitate toward resources. "We want what you have." Immigration (legal and illegal) is a huge problem throughout the affluent western world. The first Europeans were (usually unwelcome) immigrants to the American continents. They multiplied and prospered, in many areas on the backs of slave labor, while fossil energy and vast natural resources expanded the party.

If the U.S. is successful in implementing a long-term national survival plan based on population reduction, obviously we will need very rigid immigration laws to support our progress. (See item 8 on page 16.)

## Non-fossil Energy Sources

The total U.S. energy consumption in 2004 can be broken down as follows:

<b>Fossil Fuels</b>	<b>Non-fossil Fuels</b>
Oil 40% (7.3 billion barrels per year)	Nuclear 8%
Coal 23%	Hydro 2.9%
Natural Gas 22.7%	Wood 2.1%
	Biowaste 0.5%
Total Fossil Fuels 85.7%	Ethanol 0.3%
(source: EIA, DOE)	Geothermal 0.3%
	Solar 0.06%
	Wind 0.14%

The Three fossil fuels represent a non-renewable “bank account” being drawn down at an annual rate leading to complete depletion or the point of negative energy return on investment (EROEI) in less than one lifetime. This prediction can be challenged but more optimism will just postpone the reality of the “Triple-Crisis.” New unexpected discoveries might provide extra time and a better chance to effect a transition protocol to less population and a much lower-energy future. However, the desperate consumption of additional fossil fuels will only compound the ecological issues. A sustainable future can only happen with sustainable, clean energy.

### *Nuclear*

The best source for continued, clean electricity on a large scale. However, sufficient finite fissionable uranium must be found and ultimately mined and processed without cheap fossil energy. This scenario also assumes that acceptable waste disposal and protection from terrorism can be assured. Also, nuclear, like all other non-fossil energy sources except biofuels, produces only direct electricity. No matter what energy sources we use we will need a complete rethinking of our transportation system.

### *Hydro*

Limited to acceptable sites nearly all of which have been used. Climate change has reduced water flow and electrical output in the last decade. Considerable fossil energy is required to replace or repair dams, which ultimately fill with silt. Reversible pumped hydro at 85% efficiency (as well as nuclear) can be used to smooth the sporadic output of solar and wind.

### *Biofuels*

Only for absolutely essential needs as liquid fuels, plastics, lubricants, etc.; and with full understanding of the required energy input and the deleterious effect on crop land and food supply. See pages 7 and 12 for more details. Waste products will decline as a source of fuel because the original energy sources are finite and depleting.

### ***Geothermal, Tidal, Wave, etc.***

All are site specific and cannot be scaled up to be major energy sources.

#### ***Wind***

A true, clean source that can be considerably expanded, especially while fossil fuels are still available for manufacture and installation. Sporadic electrical output could be smoothed by working in concert with solar PV and other available sources.

### ***Solar PV (photovoltaic) Plus Solar-Thermal and Concentrating Solar Power***

PV is the best modern technology providing direct electricity on a local or centralized basis. Very dilute and sporadic but infinitely scalable and especially applicable to residential use as well as direct solar-powered vehicles. In all cases, the weak output needs to be coupled with battery storage. PV electricity is our best bet for a long clean future. Small urban and suburban farms could use 120 volt tractors with integral solar-panel arrays and large battery-packs. Huge commercial farms might better use a large portable separate array of 4 to 8 kilowatts peak power (300 to 600 square feet). This concept would allow working up to 3 acres almost on a one to one energy basis as an alternative to biodiesel as long as there is direct sunlight. The high cost and availability of PV will require a 50 year scale-up from present minuscule levels of less than 1-tenth of 1 percent of our total energy. We need massive investment in solar PV and lead/acid battery recycling facilities. Lithium or nickel batteries have raw material supply, cost, and recycling issues yet to be resolved.

#### ***Solar Thermal and Passive***

Needs to be fully integrated into all existing and new building design as other heat sources, including wood, will become very scarce and are polluting.

## Action on a National Level

The personal actions suggested on page 18 can only lead to survival if they are integrated with a national master plan and all citizens contribute equitably to the common goal. This concept is contrary to the tradition of individual freedom and genetically-hardwired human tendency for acquisition, population growth, personal pleasure, competitive or economic success, and aggressive resource consumption regardless of long-term consequences or negative effects on others. We need leadership that reflects the long term interests of every citizen. Earlier civilizations failed to accept these rules otherwise they would be here now.

1. **Commit all possible attention.** Our energy adaptation in the next decades (not centuries) is more important than terrorism, epidemics, social security, health care, space exploration, military spending, or any other national program. In most of these cases, these other issues are interactive with fossil-energy depletion (peak oil), population growth, and ecological devastation. We need a “Manhattan Project” to address the triple-crisis and define timely solutions.
2. **Immediate rationing of all fossil energy.** Leaving supply and demand to inflationary market-forces is devastating to the poor and does not control consumption by the wealthy. With rationing, we can equitably buy time to transition to a sustainable modern economy. Decreasing consumption to control energy cost on a predictable basis (a Depletion Protocol or Five Percent Per Year Reduction Plan as some have suggested) is our best hope.
3. **Implement massive education** at all levels to raise public awareness of the seriousness and perils of the triple-crisis including the need for urgency to act before it is too late. The warnings are everywhere. We need as much time as possible if there is any hope for mitigation to a soft landing. A convincing argument is especially needed to control population.
4. **Subsidize development and transition to truly sustainable renewable energies** long before they can compete on even footing with residual fossil fuels. Focus on legitimate long-range goals such as solar-panel and battery manufacturing instead of accelerating heroic efforts to find and consume the last remaining fossil fuels...our children’s inheritance.
5. **Define and support population relocation** from unsustainable, energy-dependent, food deficient megalopolis centers to self-sufficient low-energy communities as defined in page 17.
6. **Support revitalization of the family-farm system** so that it can supply all citizens as the fossil-energy, artificial-support system winds down. These family farms will be an integral part of the low-energy community.
7. **Begin the definition and long transition of our transportation system** from an immensely wasteful, petroleum-based “petro-insanity” to a very-efficient, short-distance, sustainable network. Ultimately, our transportation needs will have to be fueled only by renewable electricity sources.
8. **Re-establish our national security effort at our borders.** Control immigration to insure negative population growth (page 13). This will become more apparent if we, as a nation, are successful on a survival path and the rest of the world does not follow.

We will have to reduce our military presence throughout the world as much lower energy availability leads to reduced globalization. The best way to answer these issues is to **consider our future bargaining power without fossil energy.** Whether we like it or not, we will no longer have the means to support military activity throughout the world. We will have to draw the line somewhere, better at our borders than trying to defend our states, communities, or homes.

## The Low-Energy Community

A key component in a low-energy sustainable future is a localized community center with the following objectives:

1. Strive for a balance between peripheral agricultural land which can supply almost all the food for the farmers and community center inhabitants. Local food will ultimately rely completely on manual or draft animal work, solar-powered tractors, and biofuels made locally; in lieu of food with all co-products returned to the soil. Fossil-fuel based fertilizer, herbicides, pesticides, and high-energy irrigation will end.
2. Transportation energy will become unavailable except for electric or muscle power. Therefore, the furthest distance to a community center would be a radius of about 20 miles. Present U.S. arable land of about 300 million acres will not be able to provide for 300 million inhabitants at today's rate of 10 energy units of fossil fuel input for each single energy unity of food output. An ideal community would have about a 20 mile radius (800,000 acres) with one-half (400,000 acres) arable land to support 250,000 people (1.6 acres per capita) with approximately 200,000 in non-agricultural roles. This leaves 50,000 people to live on 10,000 farms, each with approximately 80 acres with one-half tillable. The other half of the land could be forest, green space, and recreation area. On this basis, a downsized U.S. population of 250 million people could live on 1,000 such community centers utilizing 800 million acres or about one third of the total U.S. land area.
3. Each urban community center could provide the energy-mixing hub for surrounding, self-generating residential electricity as well as centralized energy sources. It would also be the social activity and manufacturing center as well as the nexus for intra-city electric-rail travel and shipping, and may also connect to traditional water-travel routes.

The above model is only an idealized form. Obviously our present urban and rural structure will have to gravitate in this direction as any other arrangement has to be compromised by the available food supply and limited by local and long-distance travel requirements.

**Food production and travel (movement of people and/or commerce) will be the greatest challenges of the future. Domestic heating and power are a little less serious but still very difficult. Reduced population (see page 13) is essential to implementing a 50-year plan based on relocalized community living. Traditional walkable urban centers are better starting points for the low-energy community concept.**

## Personal Action

Hopefully you have read this far and can appreciate the seriousness, magnitude, and complexity of the “Triple-Crisis.” Our best hope is to enact massive change on a national level. But, national redirection only happens as a response to a ground swell of combined personal action ... a protest movement or a revolution. Nothing will happen if individuals do not take their fate into their own hands. In addition, there are many things individuals should do to be ready for the coming crises whether they be power shutdowns, food shortages, or climate-caused catastrophes. Remember, don’t plan on calling someone on your cell phone to come and save you. Everyone will be too busy saving themselves.

Below are actions you can take immediately:

1. Continue to educate yourself about energy, population, and ecology. Don’t be misled into complacency by the delusions (page 12). Join with others for support.
2. Drastically decrease your personal gasoline consumption. (One-eighth of the world’s petroleum goes to American motoring). This will save money as prices steadily rise. If you can’t afford a hybrid, buy one of the many cars that gets 35 mpg and drive half as far. This is the easiest first step and will be safer when there are fewer big cars.
3. Tighten up and heat only a core area of your home (kitchen, bathroom, laundry, living area) to less than 65 degrees F. for the winter months. Wear much warmer clothes. Three hundred square feet per person would be luxurious for 99% of the world. Rearrange water pipes and insulation accordingly. In hot climates, move the living area to a cooler zone (cellar, breezy area) to minimize air conditioning. When the weather cooperates, you can expand back into the rest of your home.
4. Grow a garden. Dig up the lawn, fertilize and build up the soil. Start now. It takes a few years to get up to speed. Remember one acre could be a commercial farm in China. Learn where food comes from and how to store it. A good part of suburbia is built on good farm land. Buy a copy of *Mother Earth News*.
5. Get the kids involved and start your own solar photovoltaic system. A couple 150 watt panels, charge controller, batteries, and 1000 watt 120-volt inverter costs about \$3000. Don’t worry about intertieing with the grid as this will be your personal back-up system. Check state incentives.

**Finally, and most importantly, keep this movement expanding by reproducing this survival handbook ... by ones, hundreds, thousands. Mail them out or leave them anywhere. Add your comments or opinions. This is an anonymous work-in-progress that must reach great numbers of Americans in a very short time. Thanks for becoming proactive.**

# WHY IS GAS SO EXPENSIVE?

## The Triple-Crisis of Civilization

Finite-Energy • Population-Growth • Eco-Devastation

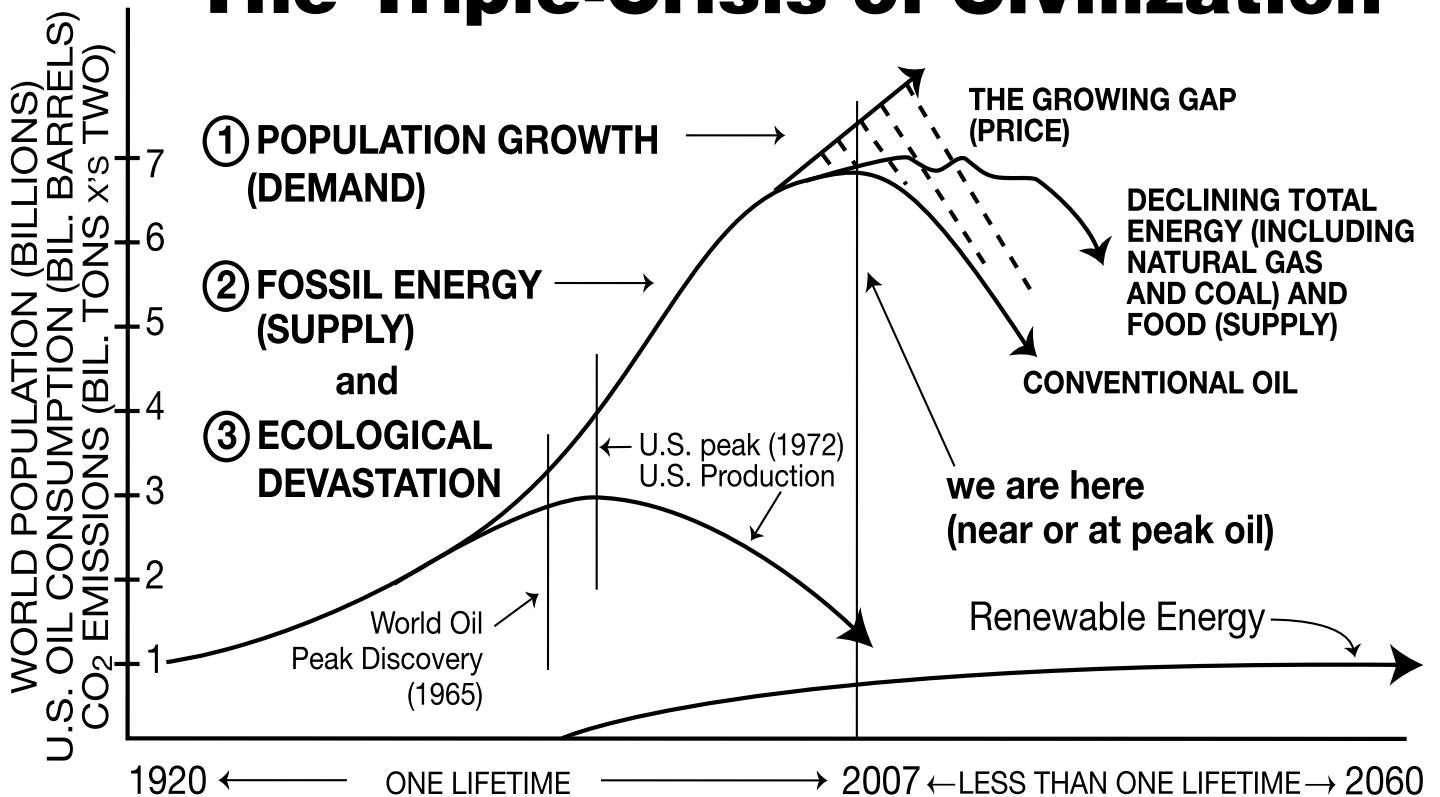
Survival Handbook



What's inside:

- Honest answers and action
- Respected references
- Counter-productive delusions
- An overview (2007)

## The Triple-Crisis of Civilization



# WHY IS GAS SO EXPENSIVE?

## The Triple-Crisis of Civilization

Finite-Energy • Population-Growth • Eco-Devastation



Survival Handbook

What's inside:

- Honest answers and action
- Respected references
- Counter-productive delusions
- An overview (2007)

## The Triple-Crisis of Civilization

