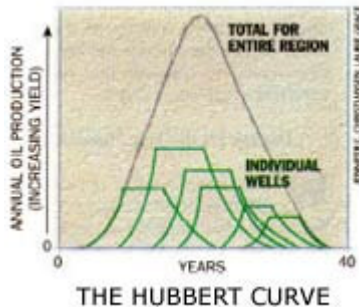


# PEAK OIL PRIMER

## What is Peak Oil?



Peak Oil is the simplest label for the problem of energy resource depletion, or more specifically, the peak in global oil production. Oil is a finite, non-renewable resource, one that has powered phenomenal economic and population growth over the last century and a half. The rate of oil 'production,' meaning extraction & refining (currently about 83 million barrels/day), has grown in most years over the last century, but once we go through the halfway point of all reserves, production becomes ever more likely to decline, hence 'peak'. Peak Oil means not 'running out of oil', but 'running out of cheap oil'. For societies leveraged on ever increasing amounts of cheap oil, the consequences may be dire. Without significant successful cultural reform, economic and social decline seems inevitable.

### Why does oil peak? Why doesn't it suddenly run out?

For obvious reasons, people have extracted the easy-to-reach, cheap oil first. The oil pumped first was on land, near the surface, under pressure and light and 'sweet' and easy to refine into gasoline. The remaining oil, sometimes off shore, far from markets, in smaller fields, or of lesser quality, will take ever more money *and energy* to extract and refine. The rate of extraction will drop. Furthermore, all oil fields eventually reach a point where they become economically, and energetically no longer viable. If it takes the energy of a barrel of oil to extract a barrel of oil, then further extraction is pointless.

### M. King Hubbert - the first to predict an oil peak

In the 1950s a US geologist working for Shell, M. King Hubbert, noticed that oil discoveries graphed over time, tended to follow a bell shape curve. He posited that the rate of oil production would follow a similar curve, now known as the Hubbert Curve. In 1956 Hubbert predicted that production from the [US lower 48 states would peak in 1970](#). Shell ordered Hubbert not to make his studies public, but the notoriously stubborn Hubbert went ahead and did it anyway. As it turned out, most people inside and outside the industry dismissed Hubbert's predictions. In 1970 US oil producers had never produced as much, and Hubbert's predictions were a fading memory. But Hubbert was right, US continental oil production did peak in 1970/71, although it was not widely recognized for several years and only with the benefit of hindsight.

No oil producing region neatly fits bell shaped curve exactly because production is dependent on various geological, economic and political factors, but the Hubbert Curve remains a powerful predictive tool.

### So when will oil peak globally?

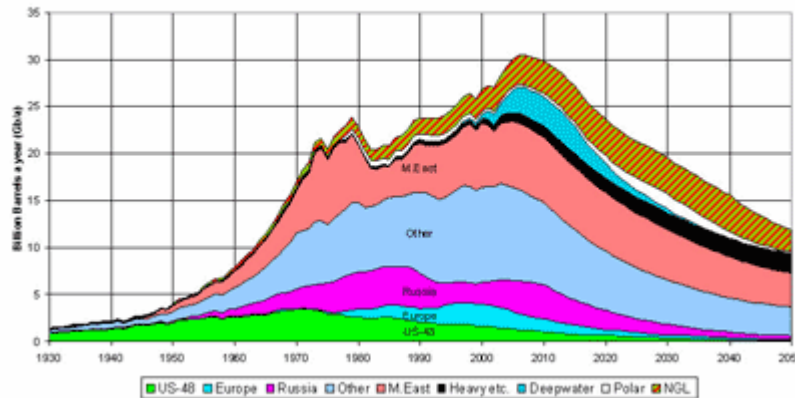
For about 30 years the world has been finding less oil than it has been consuming. Discovery of new oil fields peaked [in the 1960s](#). Around [50 oil producing countries have already peaked](#) and now produce less and less oil each year, including the [USA](#) and the North Sea. Hubbert's methods, and variations of them, and other methods entirely, have been used to make various projections about the global oil peak, with results ranging from 'already peaked', to the very optimistic 2035. Many of the official figures used to model oil peak such as [OPEC figures](#), oil company data, and the USGS discovery projections, upon which the international energy agencies base their own reports, can be [shown to be very unreliable](#). Several notable scientists have attempted independent studies, most notably Colin Campbell and the [Association for the Study of Peak Oil and Gas \(ASPO\)](#).

At least 4 major studies have said 2006- 2007

- References:
1. WOCAP Model , Ali SamSam Bakhtiari <http://samsambakhtiari.com>
  2. World Petroleum Life Cycle <http://dieoff.com/page133.htm>
  3. Oil Depletion Analysis Centre <http://www.odac-info.org>  
"Oil Field Mega Projects 2004" report & news release
  4. Assoc. for Study of Peak Oil and Gas (ASPO)  
<http://www.peakoil.net/Newsletter/NL51/newsletter51.pdf>

See also the Energy Bulletin at: <http://www.energybulletin.net>

## ASPO 2004: Oil and Gas Liquids



ASPO's latest 2004 model suggests a peak of 'conventional' oil in 2005, and all oil and gas liquids in 2008. Others such as [Kenneth Deffeyes](#) and [A. M. Samsam Bakhtiari](#) have made similar or even earlier predictions, although precise predictions are difficult as much secrecy shrouds important oil and gas data.

Globally, [natural gas](#) is also expected by some to peak within decades, although its effects are more localized due to the added expense of transporting liquefied natural gas (LNG). Both British and North American natural gas may have [peaked already](#).

### What does this mean?

Our industrial societies and our financial systems were built on the assumption of constant growth, growth based on ever more readily available cheap fossil fuels. Oil in particular is the most convenient and multi-purposed of these fossil fuels. Oil currently accounts for about [40% of the world's commercial energy](#), and about [90% of transportation energy](#). Oil is so important that the peak will have vast implications across the realms of geopolitics, lifestyle, agriculture and economic stability.

### Key Facts:

- it takes 10 calories of (fossil fuel) energy to produce 1 calorie of food (in the U.S.), this includes fertilizer, tractor fuel, preparing, packaging, transport (Dale Allen Pfeiffer)
- Oil Tankers are "close to 100%" in use right now. The tanker industry considers 90% to be fully using fleet. Most tankers in use in 31 years of tanker history. (Houston Chronicle, Nov. 13, 2004)
- Oil production in North America peaked in 1983 (Duncan's World Oil Forecast #5)
- Oil production in the Former Soviet Union peaked in 1987 (Duncan's.#5)
- Oil production in United Kingdom peaked in Nov. 1999 and is declining at 8% a year (Chris Grabowski, editor Petroleum Review (UK))
- The world rate of "oil discovery" peaked in the 1960's. (Heinberg's books, etc.)

### But it's just oil - there are other fossil fuels, other energy sources, right?

To evaluate other energy sources it's important to understand the concepts of [embodied energy](#) and [Net Energy or ERoEI](#) Energy Return on Energy Invested. One of the reasons our economies use ever increasing quantities of oil is precisely because oil has a comparatively high ERoEI. Historically, for every barrel of oil used for exploration and drilling of oil, 100 barrels were found. This was an unprecedentedly high ratio for an energy source, although these days the ratio is far lower. Certain alternative energy 'sources' actually have ERoEI ratios of less than one, such as photovoltaics (arguably) and most methods of industrially producing biodiesel and ethanol. That is, when all factors are considered, you probably need to invest more energy into the process than you get back.

For instance, [hydrogen](#), touted by many as a seamless solution, is actually an energy carrier, but not an energy source - it must be produced using an energy source such as natural gas or nuclear. So while it may or may not be a convenient store of energy, its Net Energy will be negative. Some alternatives such as wind and hydro have better ERoEI, however their potential expansion may be limited by various physical factors. Even in combination it may not be possible to gather from renewable sources of energy anything like the amount of energy we are used to.

For certain tasks, such as **air travel**, no other energy source can readily be substituted for oil. Alternative energy infrastructures require long periods of investment, on the scale of decades, to be widely implemented. We may be already leaving the period of cheap energy before we have begun seriously embarking on this task.

It's worth noting briefly that any EROEI study is complex and different methods of accounting can come up with vastly different results, so any net energy study might be viewed with some suspicion. Perhaps the best method yet developed is [Howard Odum's eMergy analysis](#). But we may not know for sure how useful renewable energy technologies are until the hidden fossil fuel energy subsidies are finally removed.

## What can be done?

### Possible Solutions?

(links to first four are listed at <http://energybulletin.net/primer.php> )

- Raising awareness ,
- Relocalization
- Local Currencies and Steady State Economics (Ithaca hours / [ithacahours.org](http://ithacahours.org))
- Permaculture (many permaculture books, magazines and websites)
- Intentional Communities. ([ic.org](http://ic.org) and "Creating a Life Together" book by Diana Leafe Christian)
- Building Lifeboats (Heinberg's "Powerdown" book)

[List assembled by Will Rhodes, updated 4/12/05. Duluth, MN, USA, a member of Duluth Area Green Party, our energy web = <http://DuluthGreens.org/energy> ]

Many people are working on partial solutions at various different levels, but there probably is no cluster of solutions which do not involve some major changes in lifestyles for the global affluent. Peak Oil presents the potential for quite catastrophic upheavals, but also some more hopeful possibilities, such as a return to simpler and more community oriented lifestyles.

Peak Oil Action is a grass roots awareness raising network helping people meet up and discuss peak oil. Join or start a meet-up in your neighborhood.

[www.peakoilaction.org](http://www.peakoilaction.org)  
[oilawareness.meetup.com](http://oilawareness.meetup.com)

**The Post Carbon Institute Outposts.** The PCI is a think tank devoted to exploring the implications of energy descent. They write, "the most important initiative of the Post Carbon Institute is working with groups of concerned citizens to prepare their community for the Post Carbon Age. These groups are *Outposts* in the sense that they are community-based extensions of the Post Carbon Institute; they operate autonomously yet receive guidance and electronic infrastructure from the Institute. Outposts work cooperatively in their local community to put theory about living with less hydrocarbons into practice while sharing knowledge and experiences with the global network of outposts."

[www.postcarbon.org](http://www.postcarbon.org)

**The Community Solution to Peak Oil.** "The Community Solution is a program of Community Service, Inc. Community Service is dedicated to the development, growth and enhancement of small local communities. We envision a country where the population is distributed in small communities that are sustainable, diverse and culturally sophisticated."

[www.communitysolution.org](http://www.communitysolution.org)

Permaculture: David Holmgren, one of the co-originators of the permaculture concept has written a book called *Permaculture: Principles and Pathways Beyond Sustainability* which deals explicitly with the peak oil problem. Permaculture principles work towards re-designing cultural and agricultural practices for an energy descent world. By doing a course locally or with a bit of study, you can start applying permaculture principles on a suburban or rural plot.

[www.permaculture.org.au](http://www.permaculture.org.au)  
[www.holmgren.com.au](http://www.holmgren.com.au)

Local Currencies and Steady State Economics:

*Local Currencies:* [Richard Douthwaite](#), a 'reformed economist', has proposed a number of alternative monetary systems to deal with energy decline and the associated monetary crises which might arise post-peak. Local currencies like LETS are in operation around the planet already (although LETS itself is somewhat problematic). Experiment now with local currencies to help survive economic crises.

[The Foundation for the Economics of Sustainability \(FEASTA\)](#) has some of Richard Douthwaite's publications available for free online, including entire books as well as masses of other excellent research and articles by other writers, relating not just to economics and local currencies, but to various aspects of sustainability.

See also: [www.communitycurrency.org/resources.html](http://www.communitycurrency.org/resources.html)

*Steady State Economics:* The [Center for the Advancement of the Steady State Economy \(CASSE\)](#) promote alternatives to the ecological insanity of growth based economics. Read their position paper here:

[www.steadystate.org/PositiononEG.html](http://www.steadystate.org/PositiononEG.html)

**Intentional Communities:** Intentional Community (IC) is an inclusive term for ecovillages, cohousing, residential land trusts, communes, student co-ops, urban housing cooperatives and other related projects and dreams... ICs represent one of the sanest ways of dealing with energy peak.

[www.ic.org](http://www.ic.org)

[gen.ecovillage.org](http://gen.ecovillage.org)

[www.cohousing.org](http://www.cohousing.org)

**Surviving Peak Oil:** A good collection of essays edited by Dale Allen Pfeiffer on "what measures can people of limited means undertake to ease their transition into a post-petroleum world."

[www.survivingpeakoil.com](http://www.survivingpeakoil.com)

**The Depletion Protocol:** (previously referred to as the Uppsala or Rimini Protocol) is an ethical global political framework for sharing the world's remaining oil reserves more equitably than free market forces would allow, to avoid resource wars and profiteering. Help promote it:

[Introduction to the Depletion Protocol](#) by Colin Campbell (Word .doc format)

[How to avoid oil wars, terrorism, and economic collapse](#) by Richard Heinberg

**Lobbying:** Lobby governments to spend now on renewable energy and improving agricultural practices. Many facts are summarized in the following 'convince sheet' by Bruce Thomson: [gretchange.org/ov-thomson,convince\\_sheet.html](http://gretchange.org/ov-thomson,convince_sheet.html)

### Online Discussions:

Got questions? Want to talk with like-minded people? See these links:

[www.peakoil.com](http://www.peakoil.com) - online news and forum

[www.peakoilaction.org](http://www.peakoilaction.org) - meet people on and offline

## What can planners do?

I believe that land use/environmental planners, as facilitators of change, have a vital role to play in this crazy roller coaster ride as the world slides down the back side of the oil peak into oil depletion and the inevitable oil panic.

We cannot sit back and wait to be told what to do by our political masters, because generally that would be the blind leading the intentionally blind. Politicians will not make unpopular decisions on resource allocation (e.g. oil price rises and usage priorities) until forced to do so by circumstances.

Instead, we need to factor in post-oil thinking NOW into *all* our strategic planning advice. It is not just as case of finding oil alternatives, but a fundamental shift towards post-oil urbanisation:

- All new development as walkable neighbour-hoods supplying *all* our daily needs, including market gardening foods, employment, schools,
- Retrofit dormitory suburbs to become self sufficient townships/ urban villages. Increase real densities.
- Regularise informal settlements tenure to allow communities to develop in appropriate places.
- Do *not* allow retail/commercial development on cheaper land on fringes of cities and towns.
- Change employment patterns to encourage working from home and use of public transport linking the townships and central places.

- Strengthen social networks as part of community building and sustainable development.
- Urge even more energy efficient design in *everything* and localised energy production, to reduce use of electricity and oil (substitutes).
- Stop relying on more roads to solve transport problems. If public transport cannot fully serve a new development, then don't permit it or build it.
- Preserve good agricultural land near towns for market gardening to reduce food importation.
- Educate communities about energy efficiency and control importation of fuel wasteful vehicles.
- Educate governments and customary/tribal land leaders, rural communities on oil depletion issues.
- Encourage investigation on import replacement for all the oil based products we have relied upon.
- Encourage use of local renewable resources for construction of buildings and infrastructure. Revert to traditional building materials and hand tools.
- Rethink tourism as a key revenue earning industry. Air travel will become increasingly costly, if at all.
- Do not delay – think and act locally now.

*Roger Brewster  
Landplan Australia Pty Ltd*

## Links

### Where can I get more information?

**The best book written on the converging catastrophes of our era that every planner should read is**  
The Long Emergency by James Howard Kunstler

Several articles already published on this site provide good introductions to this topic:

[The coming global energy crunch](#). A great introductory article by Aaron Naparstek

[Plan War and the Hubbert Oil Curve](#), an interview with Richard Heinberg

[The Petroleum Plateau](#) by Richard Heinberg on the current plateau in world oil production.

[Debunking the mainstream media's lies about oil](#) by Dale Allen Pfeiffer

[The oil we eat](#) by Richard Manning looks at modern agricultures' dependence on fossil fuels

There are some great introductory websites like:

[Wolf at the Door: A Beginner's Guide to Oil Depletion](#) - available in French, Polish and English.

[Life After The Oil Crash](#) – a question and answer style introduction.

[Peak Oil Center](#) - a very concise introduction.

Some excellent original media about peak oil is being generated at:

[Global Public Media](#)

[From The Wilderness Publications](#)

Research and reference articles can be found at:

[ASPO](#) - original research from The Association for the Study of Peak Oil & Gas

[ASPO Ireland](#) - The Irish branch of ASPO which now publishes the ASPO monthly newsletter

[ODAC](#) - the Oil Depletion Analysis Centre

[DieOff.org](#) - an alarming but scholarly collection of research

### On Nature and Ecology

The state of the world? It is on the brink of disaster On: The Millennium Ecosystem Assessment 4/2/05  
[http://news.independent.co.uk/world/science\\_technology/story.jsp?story=624667](http://news.independent.co.uk/world/science_technology/story.jsp?story=624667)

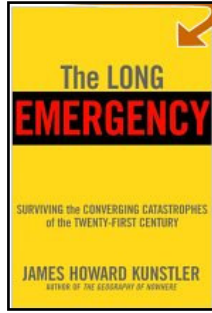
End of the Wild: The extinction crisis is over. We lost. <http://bostonreview.net/BR29.2/meyer.html>

How to Survive the Crash and Save the Earth <http://ranprieur.com/essays/saveearth.html>

The Value of the Remaining Wilderness

[http://www.fromthewilderness.com/free/ww3/040805\\_remaining\\_wilderness.shtml](http://www.fromthewilderness.com/free/ww3/040805_remaining_wilderness.shtml)

## BOOK REVIEWS



### **The Long Emergency: Surviving the Converging Catastrophes of the Twenty-First Century**

James Howard Kunstler 2005

Reviewed by Lloyd Alter, *Treehugger* May 2005

[http://www.treehugger.com/files/2005/05/the\\_long\\_emerge\\_1.php](http://www.treehugger.com/files/2005/05/the_long_emerge_1.php)

*The Long Emergency* is an alarming view of the future written Mr James Kunstler, author of *The Geography of Nowhere*, *Home from Nowhere* and *The City in Mind*.

*The Long Emergency* points out that our economy for the last hundred years has run on a “massive one-time endowment of cheap stored solar energy” and that the jig is up. That the easy pickings are over and the remaining oil will be more expensive and difficult to extract. That political turmoil in producing countries will turn off the tap long before the oil runs out and much sooner than we think. That the Hydrogen economy is a “laughable fantasy”. – “instead of finding a new fuel to run suburbia, a far more sane and intelligent response might be for Americans to live in traditional walkable communities serviced by public transit”. That Biomass is a joke- the fuel used to grow the corn that is mulched for biomass is greater than the output.

The book’s position is extreme and apocalyptic. But the conclusions are logical:

Suburbia is dead- the average American makes 11 car trips per day getting milk, picking up kids. This is over and the endless tracts of housing in the suburbs will be depopulated. Fortunately, due to the nature of the construction materials used to build them, they will not take too long to disintegrate.

Universities and our confidence in a knowledge based economy are dead- 50 years ago 30% of us were farmers and now only 1.6% of us are. This will reverse as growing food locally will become the most important job around. MBA’s are useless- farmers are not.

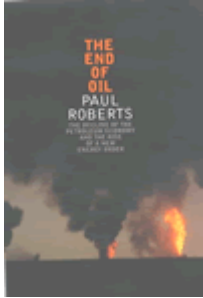
Walmart and Globalism are dead- they all survive on endless supply chains based on cheap oil.

Political stability in North America is dead- the Southwest will depopulate as air conditioning becomes unaffordable and those with water and farmland will pull up the drawbridges. (30 years ago Albertans sported bumper stickers- “let the eastern bastards freeze in the dark!” – we will see this again.)

Kunstler defines our economy: “The dirty secret of the American economy in the 1990’s was that it was no longer about anything except the creation of suburban sprawl and the furnishing, accessorizing and the financing of it. It resembled the efficiency of cancer. Nothing else really mattered except building suburban houses, trading away the mortgages, selling the multiple cars needed by the inhabitants, upgrading the roads into commercial strip highways with all the necessary shopping infrastructure, and moving vast supplies of merchandise made in China for next to nothing to fill up those houses”

After reading a few chapters we were ready to just put our head into our gas oven and end it all, it is such a depressing picture. Then we were put off by diversions into discussions about AIDS and pandemics that we thought irrelevant to the discussion.

The book is unrelentingly negative about the future. Too negative. One can take positive actions to adapt to this crisis: Use less. Buy local. Bike instead of drive. Live close to where you work. We will all be living the Treehugger lifestyle whether we like it or not. If more of us are working with our hands, farming instead of blogging, this might be a good thing. Take this book as a wake-up call and get to work on building a sustainable society while we still can.



## Brave nightmare world

***The End of Oil: On the Edge of a Perilous New World* by Paul Roberts**

*The End of Oil: On the Edge of a Perilous New World* by Paul Roberts, 2004, Houghton Mifflin. ISBN: 0747570752, 332 pages. US\$33.

Reviewed by David Isenberg

In retrospect, one of the funniest lines about the US invasion of Iraq will be the one uttered by the war's defenders who managed to insist with a straight face that this wasn't a war for oil.

Oil is the lifeblood of the world economy. It is so deeply entrenched in our societies that it is an existential fact of life. And any country that happens to have a substantial share of the world's proven reserves will always be, to use a military term, a center of gravity.

But as the very lucidly written *The End of Oil* makes clear, the day of reckoning for the oil industry is in sight, at least for some of us, and the costs when the oil runs out and the world is forced to confront both its energy needs and its abysmal lack of preparation for a successor to petroleum are going to staggeringly high.

One doesn't have to look far for signs of this. Consider that the US National Commission on Energy Policy, a bipartisan group of top energy experts, recently released a strategy, more than two years in the making, to address major long-term US energy challenges. The report, "Ending the Energy Stalemate: A Bipartisan Strategy to Meet America's Energy Challenges", contains detailed policy recommendations for addressing oil security, climate change, natural-gas supply, the future of nuclear energy, and other long-term challenges.

Also, members of the Organization of Petroleum Exporting Countries (OPEC) meeting in Buenos Aires in mid-December appeared to be more concerned about the impact on their economies of measures to reduce greenhouse-gas emissions than about the potentially disastrous consequences of global warming, which are largely attributable to the burning of fossil fuels.

If the past is truly the prologue to the future, then author Paul Roberts, a longtime contributor to Harper's magazine, has served us well. For in large part, his book is a history of not only oil but of humanity's quest for energy. As he notes, for most of the past 6,000 years, human history has been characterized by a constant struggle to harness ever-larger quantities of energy in ever more useful ways. The wide-scale use of coal in England set the conditions for the Industrial Revolution. A century later, oil and natural gas completed the transformation, dragging the industrializing world into modernity and in the process, fundamentally and irrevocably reordering life at every level.

In short, energy is the Holy Grail. As Roberts writes:

Energy has become the currency of political and economic power, the determinant of the hierarchy of nations, a new marker, even, for success and material advancement. Access to energy has thus emerged as the overriding imperative of the 21st century. It is a guiding geopolitical principle for all governments, and a largely unchallenged heuristic for a global energy industry whose success is based entirely on its ability to find, produce, and distribute ever-larger volumes of coal, oil, and natural gas, and their most common by-product, electricity. Yet even a cursory look reveals that, for all its great successes, our energy economy is fatally flawed, in nearly every respect. The oil industry is among the least stable of all business sectors, tremendously vulnerable to destructive price swings and utterly dependent on corrupt, despotic "petrostates" with uncertain futures.

That, however, does not begin to cover the downside. Other factors must include climate change due to the greenhouse effect; the finite quantities of petroleum remaining; the challenges of finding, producing and distributing it; its use in generating electricity - the fastest-growing segment of the energy market - and its overwhelming demand on the existing infrastructure; the breakdown of the energy system in the developing world, where the urgent quest for survival doesn't allow for environmental considerations; and the future

energy demands of countries such as China or India, to name just a few of the issues Roberts covers.

Roberts' reporting is both wide-ranging and insightful. In detailing the global oil addiction, his travels take him from Saudi Arabian oilfields to Azerbaijani pipelines to natural-gas terminals in Mexico to a Vancouver power company to wars between competing gas-station chains in China.

But he never strays far from his central point: that the energy economy is changing, and not always for the better. We no longer have a choice in the matter. To use a favored expression from those who talk about the probabilities of another September 11, it is not a question of if, it's a question of when.

Make no mistake, change is coming. And if history is any guide at all, it will be traumatic. That is assuming that the countries of the world actually try to cooperate with one another on issues such as energy conservation or adopting new energy technologies, ie natural gas, hydrogen, solar and wind. It also assumes willingness on the part of the existing multinational energy companies to move forward on these technologies instead of trying to wring every last cent out of their existing capital stock. That is not something the current US administration is likely to encourage given its existing ideology.

One of the more interesting issues that Roberts covers deals with the "peak oil" theory; in essence, the point when we hit the halfway mark in using the entire world's oil supply. While scientists and free-market ideologues argue over reserves and undiscoverable and recoverable oil, one estimate has us hitting the peak in just 25 years, around 2030.

Of course, that figure could be off, but other facts are indisputable - such as the fact that the majority share of the world's oil is in the Middle East, is controlled by OPEC, which already exerts inordinate influence over world oil prices, and will gain more as non-Middle East sources run out. And they are running out fast. Even taking into account optimistic projections, such as increased Russian oil production, non-OPEC oil production will peak in 2015.

However, the book is not entirely gloom and doom. There are things that can be done. But because of the central role of the United States as an oil consumer and key market for the rest of the world, its active participation is required on issues like the increased availability of natural gas, adoption of a carbon penalty, and an all-out effort to cut consumption of oil and other energy. Boosting automobile fuel-efficiency standards would be an example. How likely is this? Considering the last time the United States got serious about that was after the 1974 oil shocks, not very.

## **Oil Peak Poses Dramatic Challenges: A Letter to the Future**

By Suzanne Duarte April 8, 2005

Dear Ones of the Future,

I haven't been able to write you for quite a long time. The main reason is that I was convinced that nobody would want to publish or read what I had to say. The bubble of delusion was too thick. I'm speaking of the delusion that everything would continue as it has, that technology would solve any problems we humans had created, that something or someone would save us.

You know, I've been saying for the last 20 years that "This can't last". I've been observing and learning for 20 years about why it can't last and what people need to do in order to survive. But the way I see things has seemed too much at odds with what the publishing world wanted to publish, or even what most of my friends wanted to read or hear. So it's been hard to have confidence and conviction that these Letters to the Future would ever see the light of day.

However, strangely, that has changed recently. All the threats seem to be coming together and getting attention at the same time, just since the beginning of this year, 2005. Peak oil (aka the energy crisis) is finally breaking through the delusional bubble at the same time that the Millennium Ecosystem Assessment has announced that the majority of the Earth's ecosystems are on the brink of collapse, and at the same time that global warming is beginning to be taken very seriously. In fact, we now know that global warming will probably be much worse than previously estimated, even if all carbon emissions ceased right now, which they won't. So in other words, everything the ecologists have been warning about for decades is finally becoming reality, although the politicians and the corporate media are barely acknowledging it.

At the same time, economic collapse in the United States now seems quite near, and if it occurs, it will trigger the collapse of the global economy. The skyrocketing price of oil will contribute to this collapse. Many people think that there will be global warfare over resources: first oil, then water, then whatever is left. But global war depends entirely on fossil fuels and will become increasingly expensive.

Ross Gelbspan and others say global warming is the most serious threat to the planet and human survival because it places all ecosystems under stress and makes climate, weather, and growing seasons unpredictable. Food is definitely going to be a problem. Lester Brown has been warning about this for years. Already harvests are yielding less than expected and needed for the growing world population. Already there are water shortages. And soils have been depleted and sterilized by decades of improper use: pesticides, herbicides, fertilizers, the removal of natural cover due to overgrazing and clear cutting, and erosion. Severe food shortage would lead to famines.

But I think that the energy crisis is going to hit even earlier than the impact of global warming. That's just a guess. Estimates vary, but it appears we are about to reach the peak in oil production worldwide. This news is coming out now in a torrent over the internet, though barely noted in the corporate media. But everyone nationwide is feeling the impact of rising prices at the pump, with no decline in sight.

For those of us who can comprehend what peak oil means, it is very sobering to realize how profoundly this will change our lives in the near future. It effectively means that the entire support structure or infrastructure of global civilization, the global economy, could collapse quite suddenly. It's all built on the illusion of an unending flow of cheap oil, for which there is no replacement. This means that everything that we have taken for granted and consumed during my lifetime, as we deplete most of the world's resources, will deteriorate and disappear within a matter of a few years; perhaps as soon as 2008 or 2010.

That is, delivery systems for food and water, energy for electricity and heating, sanitation systems, waste disposal, communication and transportation will all come to a screeching halt within my lifetime. All the things I depend on to keep this old body going will no longer be available. I'll be lucky if I live in a place where food can be brought in by horses. I don't know how water will be purified. I don't know how we'll keep warm.

Anyway, this is what I've been thinking about lately, and telling others to pay attention to. Only a few friends are receptive to this information at this point, but that even a few are willing to acknowledge the reality and implications of peak oil is encouraging. Survival will depend entirely on our ability to work together with other sane human beings. Meanwhile, the corporate media persist in maintaining the illusions of the industrial growth society. They have to. If they tell people the truth, people will stop consuming and their corporate advertisers and owners will silence editors and journalists who tell the truth. This has happened.

Television is surreal. It focuses on the rich and famous, on celebrities, corporate predators and politicians, and the opulent, glitzy life they lead, with the promise that "You can, too -if only you buy our products.

Television broadcasts fantasies of the possibility of gaining limitless wealth and consuming endless quantities of resources: living in huge mega-mansions, having multiple expensive cars and vast closets full of designer clothes. There is no attention given to the wastefulness of this way of life or the consequences for the future.

What a shock it will be to the television-viewing masses to realize that they can no longer get whatever they want from whatever part of the world it comes from, that they can no longer hop on a plane and fly off to some exotic resort or go home to visit distant relatives, that they can no longer talk to a loved one on the other side of the planet, or even send and receive mail. People will become isolated in their geographic regions again, but with fewer resources to sustain them than ever before in human history, and fewer means to create what they need because all the old pre-fossil-fuel technologies have disappeared.

For people like me, knowing that what we are used to is all going to come to a screeching halt and that all we'll be left with is toxic waste dumps and landfills full of the discarded junk of the 20th century, there is or will be no pleasure in saying "I told you so." So I won't bother. This is definitely a Pyrrhic victory. It is no victory not to have been heeded while there was still time.

So what I've been thinking about is how to contribute to sanity. For the last ten years I've been telling friends and students that the most important thing we can do for future generations is to keep our sanity. (Perhaps not coincidentally, that is also how long I've been writing these letters, almost exactly ten years. Interesting.) I still think sanity is going to be a precious commodity for future humans. I think of sanity as the ability to think in an orderly fashion, the capacity to synchronize memory, imagination, intuition, sensation and reason into accurate perception and decision making. Personal sanity is the basis for sane human relationships, and we will need sane relationships in order to work together.

In the short term, there is going to be deep trauma when the masses, especially in the United States, wake up to the reality that the future they've been ignoring is upon us, when they've been thinking it would be their children's or grandchildren's problem. There's going to be rage when they realize how much they've been lied to, how much they've been betrayed by the leaders they trusted to take care of them. Those who experience this kind of rude awakening are going to want to blame somebody. Their reptilian brains will take over, and all the predatory instincts will kick into gear because survival will be the priority. It will get ugly. There will be violence and madness and suicide. I have no doubt of this.

Blaming, of course, will be beside the point. Killing off the bastards who have betrayed us will do nothing for our survival. They won't have much worth stealing, because you can't eat a Mercedes and there won't be any gas to drive it to where there's food. The food won't be grown in the guarded enclaves of the rich. The sane response will be to build with others something that will last, systems to sustain life.

So sanity will be a priority for survival - the kind of sanity that can deal with the insanity of those who are desperate and lack understanding; the kind of sanity that can preserve the knowledge about what works and what doesn't. There will be a great need for wisdom to understand why we brought this upon ourselves and how to avoid doing it again. Storytelling will be needed to explain how this happened, to teach lessons about how our reptilian and primate brains are not going to serve us now, about how we have to evolve our consciousness to deal with the unconditional realities of our planet.

I think women and those who have been living close to the Earth will be the people who will figure out the best survival strategies. Women, because we understand relationships and how to nurture them. We are going to need sustainable relationships based on honesty and trust. None of us is going to make it through this alone. We have to work together. Those who have been living close to the Earth and understand her necessities will be valuable members of any community that is trying to grow food and save water and seeds. I foresee that it will be "sane, reverent beings," in the words of Caroline Casey, who manage to survive and carry our species through the coming time.

That's why I've decided to keep writing and try to get this book published, in the hope that it will help others to awaken to the truth, the reality we're facing in our lifetime, without losing their minds. If this book survives and doesn't get burned to provide heat for somebody's dwelling, I hope it will help you future people to receive the thread of sanity from this time. I hope it will help you to understand.

More to come.

With love,

Clarissa