Afterword to the Revised Edition

In the two years since the publication of the original edition of *The Party's Over,* the discussion of the phenomenon of peak oil and the economic and geopolitical turmoil likely to arise from it has moved from the fringe to the mainstream. Over half a dozen other books on the subject of the limits to the production of fossil fuels have appeared — including Julian Darley's *High Noon for Natural Gas,* Paul Roberts' *The End of Oil*, David Goodstein's *Out of Gas,* Sonia Shah's *Crude,* and Dale Allen Pfeiffer's *The End of the Age of Oil.* At least three organizations have been formed to research the problem of oil depletion and possible responses, including the Association for the Study of Peak Oil (ASPO); the Oil Depletion Analysis Centre (ODAC); and the Post-Carbon Institute (PCI). Additionally, a documentary film, "The End of Suburbia," (<www.endofsuburbia.com>), centering on the potential impacts of peak oil on the American way of life, and has created a minor underground sensation.

Numerous relevant websites have also sprung up, including <lifeaftertheoilcrash.net>, <energybulletin.net>, <peakoil.org>, and <oilcrisis.com>.

Soaring oil prices during 2004 prompted headlines in the *New York Times* ("The Oil Crunch," by Paul Krugman, and a May 19, 2004 editorial titled "Gasoline Hysteria"), *Le Monde* ("The Petro-Apocalypse," by Yves Cochet), CBS *Marketwatch* ("The Looming Oil Crisis Will Dwarf 1973," by Paul Erdman), and elsewhere. Even *National Geographic,* in its June 2004 cover story, proclaimed "The End of Cheap Oil."

In the short term, high oil prices appeared to be due to increased demand, lack of refining capacity in the US, and instability in the Middle East (Iraq's production just can't seem to get off the ground, due to repeated efforts at sabotage on the part of the indigenous population, and reluctance on the part of the oil companies to invest there, given the unsafe working conditions). "So why

wouldn't oil prices rocket?" asked Alan Kohler in the title of his May 19, 2004 essay at <www.smh.com.au/articles/2004/05/18/1084783514440.html>. "The last 'super giant' oilfield (more than 10 billion barrels) was discovered 40 years ago; the last American refinery was built 25 years ago; each successive American 'driving season' guzzles more gas than the last."

Although major daily newspapers talked about the immediate causes of high gas prices, they only occasionally noted that these were riding on a deeper, tectonically shifting terrain.

The Saudi Enigma

Global spare production capacity (the amount that exporting nations *could* produce if called upon, over and above what they are now producing), is now at its lowest point in recent decades — reportedly a mere 1 to 2 million barrels per day out of a total global output of about 83 million barrels per day. And most of the spare capacity exists in one nation — Saudi Arabia. But even this assessment, worrisome as it may be, rests on the assumption that official Saudi reserve estimates are correct.

As mentioned in Chapter 3, for the past three years oil investment banker Matthew Simmons has been publicly questioning whether Saudi oil wells really contain all of the oil that Saudi officials claim is there. In articles in the *New York Times* and is his new book, *Twilight in the Desert: The Coming Saudi Oil Shock and the World Economy,* Simmons has been quoted as saying that his extensive review of 200 technical papers by scientists working in the Saudi fields has led him to doubt the published figures. For many years, the country's five major oil fields — including Ghawar, the largest oil field ever discovered — have provided the core of Saudi production, but oil field operators are injecting millions of barrels of sea water each day in order to maintain pressure within the underground systems. This practice maintains extraction levels; however, the aging Saudi fields — all discovered between 1940 and 1965 — are inevitably being depleted. When the inevitable decline in extraction rates begins, seawater injection could actually accelerate the process, resulting in a rapid drop-off in oil available for the export market.

Simmons's statements were evidently so worrisome to Saudi officials that the latter arranged a high-profile symposium at the Center for Strategic and International Studies in Washington, DC in late April 2004. Their own representatives, together with prominent US government officials, assured the world that Saudi Arabia's oil fields are robust and able to supply increasing global

petroleum demands for decades to come. Saudi officials even took the extraordinary step of announcing that official reserve estimates of 261 billion barrels of recoverable oil are far too *low*. For this claim to be credible, however, independent analysts will have to see credible evidence of spectacular new discoveries — of which no word has yet leaked out. Unless such evidence emerges, it would probably be safe to characterize the Saudi statements as an act of desperation intended to shore up US support for the increasingly embattled monarchy.

In October 2004, Channel 4 News in Britain conducted an interview with Sadad Al Husseini, the recently retired vice-president for exploration of the Saudi oil company Aramco. In the interview, Husseini noted that official US forecasts for future oil supplies (which assume that Saudi Arabia can expand its oil production by over 100 percent over the next two decades), are a "dangerous over-estimate." Asked if people should be worried by the actual state of affairs, he replied in the affirmative.

Given the context of recent events, Mr. Husseini's comments carry considerable significance. They represent a radical break from previous Saudi official statements and signal that the nation with the world's largest stated petroleum reserves cannot, in fact, continue to open the oil spigot arbitrarily in order to keep prices low.[1]

Shell Game

Meanwhile, in the spring of 2004, Royal Dutch/Shell created shock waves by reducing its reported reserves on three separate occasions within a nine-week period. This 20 percent total reserve reduction was startling enough, but an examination of the reasons for the embarrassing corporate admission (which resulted in the firing or resignation of several high-level executives and the hammering of Shell stock prices), leads to even deeper questions about standard industry reporting practices, and about technologies that are being relied upon to extend current oil production levels in many countries.

Many of Shell's difficulties issued from the oil-exporting nation of Oman, where production levels have been declining for the past four years. Shell executives in that country apparently expected that horizontal drilling techniques would be able to maintain and even increase extraction rates. These expectations led them to overestimate their company's reserves within that nation by as much as 40 percent. A similar situation in Nigeria also led to downward reserve revisions.

This was bad enough for Shell, but the really grim news is what is implied for the rest of the industry. Other companies active in Nigeria — including

Italy's ENI, France's Total, and US-based ChevronTexaco and ExxonMobil — appear to have followed Shell's practice of exaggerating reserves. While new technologies — which many oil optimists are relying on to fulfill rosy projections for increased global production — appear to be effective at extracting oil from known reserves more quickly and efficiently, the overall result seems to be simply the quicker exhaustion of those reserves.

Oil's Depressing Outlook

Even as questions are being raised about global oil supply, demand is inexorably growing. China is currently increasing its oil imports by 30 percent per year, and in 2003 that nation surpassed Japan to become the world's second foremost petroleum importer. In the same year, Shanghai banned bicycles from most of its main streets in favor of automobiles.

As Chris Skrebowski of *Petroleum Review* notes in his November 2004 report "Oil Field Megaprojects," several substantial deepwater oil fields are scheduled to come on-stream in 2006, so there is some possibility of a stabilization of prices. Moreover, if current high prices lead to a renewed global recession, this could result in a drop in demand, which could in turn lead to lower fuel prices. But that effect would only be temporary. From the long-term perspective, burgeoning demand is on a collision course with emerging supply constraints, and $60, $80, and even $100 per barrel oil is possible in the near term.

When will the actual global peak of oil production occur? In the original edition of *The Party's Over,* I surveyed several authoritative forecasts and, on that basis, cited a decade-long window of 2006 to 2016 as the most likely period during which the global all-time peak in oil production will take place. The latest data — from *Petroleum Review* and Matthew Simmons, among other sources — suggest that the peak may more likely occur during the earlier years of that window. Between now and then, we will continue to experience a bumpy ride as we leave the "petroleum plateau" that we have been on for the past 30 years. Once we are off the plateau and on the downward skid, times may get very interesting indeed.

Significant New Reports

During the first months of 2005, several reports relevant to the issue of peak oil were issued; each had important implications that can only be summarized briefly here.

The Hirsch Report. Commissioned by the US Department of Energy from Science Applications International Corporation (SAIC) and released in February,

the study titled "Peaking of World Oil Production: Impacts, Mitigation and Risk Management," led by Robert L. Hirsch, examines the likely consequences of the impending global peak. The Executive Summary begins with the following paragraph:

> The peaking of world oil production presents the U.S. and the world with an unprecedented risk management problem. As peaking is approached, liquid fuel prices and price volatility will increase dramatically, and, without timely mitigation, the economic, social, and political costs will be unprecedented. Viable mitigation options exist on both the supply and demand sides, but to have substantial impact, they must be initiated more than a decade in advance of peaking.

The report offers three scenarios: one in which mitigation efforts are not undertaken until global oil production peaks; a second in which efforts commence only ten years in advance of peak; and a third in which efforts begin twenty years prior to the peak. Each scenario assumes a "crash program rate of implementation." In the first case, the study suggests that peak will leave the world with a "significant liquid fuels deficit for more than two decades" that "will almost certainly cause major economic upheaval"; even with a ten-year lead time for mitigation efforts government intervention will be required and the world will experience a ten-year fuel shortfall. A crash program initiated twenty years ahead of the event will off "the possibility" of avoiding a fuel shortfall. The report emphasizes repeatedly that both supply- and demand-side mitigation options will take many years to implement; it also notes that "The world has never faced a problem like this."

The IEA Report: "Saving Oil in a Hurry: Measures for Rapid Demand Restraint in Transport." The International Energy Agency has released, in draft form, a small book advising countries to prepare contingency plans to be implemented in the case of petroleum supply shortfalls. While not specifically predicting such shortfalls, the book analyzes the supply disruptions of the 1970s to see which demand-restriction measures were most helpful. The report advises developing policies such as:

- Driving bans on alternate days (if your license plate ends with an odd number, you would be allowed to drive on Mondays; Wednesdays, and Fridays; if it ends with an even number, you could drive on Tuesdays, Thursdays, and Saturdays).

- Reduced speed limits
- Encouragement of telecommuting
- A 50% reduction in public transport fares
- Building more carpool lanes, and making existing ones active on a 24-hour basis

The Bank of Montreal Report: "Big Footprints on the Sands of Time, and Little Footprints of Fear." In the course of this report, released March 30, 2005 by Harris Investment Management, Inc. (a member of the Bank of Montreal Investment Group), author Donald G. M. Coxe notes that even newly developed oil fields in Saudi Arabia are being pressurized with desalinated water from the Arabian Gulf. "Isn't waterflooding petroleum Viagra for aging wells?," asks Coxe. He goes on to speculate that

> the combination of the news that there's no new Saudi Light coming on stream for the next seven years plus the 27% projected decline from existing fields means Hubbert's Peak has arrived in Saudi Arabia. The Kingdom's decline rate will be among the world's fastest as this decade wanes. Most importantly, Hubbert's Peak must have arrived for Ghawar, the world's biggest oilfield, and Wall Street's most-cited reason for assuring us month after month that oil prices would plunge because there were so many billions of barrels of readily-available crude overhanging the market.

The report goes on to say that news from Mexico's Canterell, the world's second-largest field, and from the North Sea as well, is just as bad, and concludes that "oil shortages are here to stay."

The Goldman Sachs Report. This report, issued March 30, does not discuss Peak Oil per se; instead, it warns of an oil price "super spike" period — "a multi-year trading band of oil prices high enough to meaningfully reduce energy consumption" — resulting from surging demand in China and the US. The report suggests that oil prices could hit $105 per barrel by 2007. It also notes that "our new range [$50 – 105 per barrel] could prove conservative, especially if there is a supply disruption in a major oil exporting country.

The Iraq Quagmire

By far the most discussed development since April 2003 (when *The Party's Over* hit the bookstores), has been the US-British invasion and ongoing occupation of Iraq. As I discussed in my subsequent book *Powerdown* (New Society,

2004), I do not believe that this invasion was undertaken simply to commandeer Iraq's oil supply: the situation is more complex, and hinges on the Washington neoconservatives' published fantasies of world domination. However, when the Iraq adventure is seen in light of America's long-term foreign policy in the Middle East, it can certainly be regarded as an oil war. The US would have little interest in that part of the world were it not for the fact that 60 percent of proven global oil reserves are concentrated there. No doubt the strategy behind the war included the building of several large and permanent military bases in Iraq for the defense of US access to oil supplies in the region, especially in neighboring Saudi Arabia.

Accusations that the invasion was motivated by a thirst for oil gained credibility when American troops, as they entered Baghdad, faithfully guarded the Iraqi oil ministry but allowed other government buildings — including museums — to be looted. However, despite keen attention on the part of US civilian contractors, Iraq's oil production has languished, partly due to ongoing sabotage by Iraqi resistance fighters.

By now it is clear that the invasion and subsequent occupation were fraught with almost unfathomable incompetence and poor planning, all issuing from arrogant Washington neoconservative ideologues.

Revelations about the torture of Iraqis in American-run prisons have dramatically intensified the widespread perception that the entire exercise was criminal in nature. Even in the US itself, sentiment is growing that the country has allowed itself to be taken over by a ring of gangsters who have undermined the nation's international standing and strategic interests. America now faces a no-win situation regardless of whether it tries to continue the occupation or picks up and leaves. In either case it has lost face, made enemies, and squandered opportunities. The entire Middle East has been destabilized, and the flames of Islamic fundamentalism have been fanned to white heat.

For the world as a whole, the consequences of the Iraq fiasco are likely to be severe and long lasting. The invasion has created a widening rift between the US and many other nations. It has also hastened the inevitable energy crisis (by at least temporarily undermining Iraq's production capacity) and has likely made that crisis much harder to solve. This is because the destabilization of the Middle East will lead to greater geopolitical competition for control of resources. The region cannot simply be left to sort out its problems on its own: all of the world's oil-importing nations have a survival stake in the contest. And that contest is likely to become more chaotic in years ahead, as the Saudis

attempt to deal with simmering internal conflicts — an increasing population of younger people, declining per-capita incomes, increasing Islamic fundamentalist sentiment and violence, and ambiguity regarding a successor to the ailing King Fahd.

The old order in the Middle East is nearly finished, and a new one must be negotiated, with the US, Israel, China, Russia, Japan, India, Europe, and the Middle Eastern exporting countries themselves as the primary interested parties. But "negotiated" may be too tidy a term for what lies ahead in the region.

Russia, China, Europe, and Brazil are seeking a "multipolar" world order to replace the American-led regime of corporate globalization that has characterized the period since the end of the Cold War. Meanwhile former US subordinates such as Venezuela, Bolivia, and Argentina have rebelled against the "Washington consensus." The end is in sight for US-led corporate globalization, despite the continuing growth in global trade and the accelerating outsourcing of jobs from the US to India and China.

Largely as a result of the neoconservatives' unbounded hubris, the US economy and geopolitical status are unraveling more quickly than could have been imagined only a few years ago. While in 2004 the US appeared to be in the early stages of an economic recovery, that recovery is being undermined by high oil prices, staggering levels of government debt, and a ballooning trade deficit fed largely by the need for ever greater fuel imports.

The only chance for a peaceful solution to the global energy crisis will be to foster cooperation between nations, the conservation of remaining resources, and the sharing of what oil is left. This is a politically challenging scenario at best, and it has been made far more so by the Bush administration's crimes and blunders.

The Curse of Free Energy

I have received hundreds of messages in response to *The Party's Over,* scores of them suggesting that I have overlooked or underestimated various alternative energy sources. This was certainly the case in at least some instances, and information I have received from readers is reflected in the updated assessments of non-petroleum energy sources contained in Chapter 5. However, the subtext of many of these messages was that alternative energy sources will be capable of sustaining industrial civilization in more or less its present configuration far into the future. With this I disagree.

As I have pointed out in *Powerdown,* it is a mistake to view oil depletion as a technical problem that can be solved by substituting other energy sources for petroleum. This statement may seem counter-intuitive, since to most people it must appear obvious that if we are about to run out of cheap energy, the solution is to find other sources of cheap energy.

The search for supply-side solutions to the problem of resource depletion is time-honored: we humans have become masters at every imaginable strategy for increasing our rates of extraction of important raw materials. The supply-expansion gambit has sometimes succeeded for us spectacularly — as documented in Chapters 1 and 2 of this book. As I also sought to point out there, the effort has not always paid off so well — witness the legacies of civilizations that collapsed because of the depletion of topsoil, forests, grazing lands, or other essential resources. As Joseph Tainter has shown, returns from investments in complexity (which are also, in effect, investments in supply-side strategies) have a tendency to diminish over time.

Nevertheless, the motive for growth is so strong that it leads to a kind of mystique, which takes its ultimate form in what could be termed the cult of the inventor-savior. The cultic myth goes something like this: Once upon a time, the world teetered on the brink of chaos. Society had become mired in inefficient ways of producing or delivering its essential goods. All would have been lost but for the intervention of the Hero — who, through the tireless exercise of his superior intellect, produced an Invention that not only averted calamity but led to the dawn of a new and better era. Thomas Edison and Alexander Graham Bell were among the early inventor-heroes; Nikola Tesla, whose career is discussed in Chapter 2, seems to be the patron saint of the modern "free-energy" branch of the cult.

No one doubts that good ideas are helpful. Better designs and new inventions can indeed, in some instances at least, enable us to do the things we need to do in a more efficient and less wasteful manner. But will technology by itself, or a supply of new resources, or a way of more cleverly extracting or using current resources do anything more than buy us a little time?

Not all cult devotees are so bold as to suggest it, but surely the ultimate dream of those who advocate a technological fix must be some form of free energy. Suppose an inventor-savior were to come up with a simple device that, when operating, actually produced more energy than it consumed. What would be the implications? If the cultic myth is to be believed, it might mean the liberation of humanity from its age-old material burdens; we might therefore

experience a collective spiritual awakening. Wars for control of scarce resources might cease. It might mean an end not just to drudgery, but to all forms of poverty and human exploitation — truly, Paradise at last regained!

As enchanting as this mythic vision may be, I contend that it has little to do with reality. In fact, we have had an energy source that was virtually free for the past century. I am speaking not of an exotic perpetual-motion machine based on the ingenious arrangement of permanent magnets, but of ordinary old petroleum. The energy in a single gallon of gasoline is roughly equivalent to the energy expended by a human being working hard (producing a quarter of a horsepower) for a month, and an American working at a minimum-wage job can purchase a gallon of gasoline for about 20 minutes of labor. This is a ratio of 600 to 1. The only monetary investment that I can think of that has a similar rate of return is a winning lottery ticket. Thus, even for a low-wage employee, energy has been and is still so extraordinarily cheap as to be virtually free. Hence our ability to run a society in which the average person has hundreds of "energy slaves." This is probably about as close to truly free energy as human beings will ever get.

And what have we done with this effortless and inexpensive abundance? We have expanded our numbers and our per-capita consumption rates of virtually all resources. We have created widening waste streams, and we have imperiled the existence of nearly every ecosystem on the planet. Why would more "free" energy lead to anything other than more of the same? Even if we hypothesize a completely nonpolluting energy source, we would still need to eat, and we would still need raw materials of various kinds in order to maintain our still-growing numbers in the way of life to which we have become — or would like to become — accustomed. The rate of species extinctions would continue to escalate, and at some point in the not-too-distant future we would encounter an ecological crisis that threatened the continued existence of the species that matters most to us.

But what, then, is the answer? An analogy may be helpful. Suppose a man wins the lottery and suddenly finds himself in the possession of 10 million dollars. He uses the money to buy a penthouse apartment in Manhattan and a fleet of Italian sports cars; he gambles in Las Vegas; he develops expensive tastes in food, art, and clothing. Then one day he notices that he has only a few hundred dollars left in his bank account. Meanwhile his four children are nearing college age and are pestering him about enrolling in expensive schools. What is he to do? Let's say he imagines that the solution is simply to win the

lottery again, and so he begins buying more lottery tickets. In that case, the story is unlikely to have a happy ending. In reality, his best option is to sell the penthouse and cars, buy a modest home, and get a job.

I would suggest that the effort to find more sources of cheap energy is somewhat analogous to buying more lottery tickets. Even if we "win," we will simply be miring ourselves deeper in a fundamentally unsustainable mode of existence.

Thus there may be no solution to the problem of oil depletion, if by "solution" we mean a strategy that will enable us to continue living as we are. "Free" energy has enabled us to create a lifestyle that has no future, simply because it is predicated on unending growth, and continuous growth within a finite system is an impossibility.

This information may be hard to take, but take it we must. There are problems in life that can be solved and those that can't. If the problem is that the register in our checkbook hasn't been kept in order, that is a problem we can solve — though possibly only with considerable effort. If the problem is that we are getting older and cannot do all of the things we could when we were young, we are fighting a losing battle. There are better and worse strategies in that case: we could improve our diet and get more exercise, in which case we would prolong our youthfulness as long as possible. Or we could spend our days smoking cigarettes, eating junk food, and watching hours of television, in which case we would squander and shorten whatever time we had left.

Similarly, with oil depletion there is no solution — in that there is no way to substitute something else for oil and then continue as we are, which means continually growing our population and economy. But there are better and worse ways to respond to the challenge. If we were smart, we could do the equivalent of moving into a modest home and getting a job; we could improve our diets and start getting more exercise. That is, we could begin systematically and cooperatively to reduce our population and per-capita resource consumption, re-localize our economies, and maximize the efficiency of our energy usage. (I offered more specific prescriptions along these lines in Chapter 6.) Better solar panels or wind turbines could help in the transition, but only (and I must stress and re-stress the word *only*) if adopted in the context of a worldwide effort to simplify and downsize the human project.

Meanwhile, the cult of the inventor-savior only mires us deeper in denial. It gives us hope of redemption and of paradise regained — but it is a false and poisonous hope, because it distracts us from taking the intelligent though difficult actions that offer us the best chance of surviving the depletion of fossil fuels.[2]

Where the Real Hope Lies

Many other readers contacted me to say that my book is depressing. I am sorry if this is the case, but that was certainly not the intent. My aim has been simply to alert as many people as possible to a profound change that is about to overtake our civilization and our way of life. In Chapter 6, I did try to offer positive suggestions of things that people can do to help their families, communities, and nations survive the coming energy famine. In the end, optimism is most useful as a state of mind that fosters constructive action. It is self-delusional to dwell on hopeful images of the future merely to distract ourselves from facing unpleasant truths or to avoid having to take difficult actions.

While the international political scene looked bad enough as I was writing the original edition of this book (and, as I have explained above, it looks even more worrisome today), at least the subject of global oil peak is quickly getting out to a larger audience. This increased awareness will not by itself lead us toward a survivable future, but it is an essential prerequisite.

I still believe that if the people of the world can be helped to understand the situation we are in, the options available, and the consequences of the path we are currently on, then it is at least possible that they can be persuaded to undertake the considerable effort and sacrifice that will be entailed in a peaceful transition to a sustainable, locally based, decentralized, low-energy, resource-conserving social regime. But inspired leadership will be required. Everywhere I have traveled to speak on this subject, audiences have shown not just a willingness, but an almost heart-wrenching eagerness to be part of such a collective undertaking. Until inspired leadership does emerge, we must do what we can at the local level, wherever we are.