



LIVES ^{PER} GALLON



THE TRUE COST OF
OUR OIL ADDICTION

TERRY TAMMINEN

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Terry Tamminen

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*LIVES PER
GALLON*

To Art Arndt, Kyle Damitz, and all of the
other parents and children whose breath has
been lost to our petroleum addiction.

PREFACE

The quality of life on Earth, including that of its human inhabitants, may have been irreversibly defined by three obscure events that took place since *Lives Per Gallon: The True Cost of Our Oil Addiction* was first published in late 2006. Seemingly unconnected, and with only moderate significance when considered individually, these three events share the same inescapable DNA: oil.

A meeting of a few, an agonizing plea for help of many, and a shameful confession of one. Together, they paint an ominous picture that regrettably validates many of the conclusions drawn and predictions made when this book was first printed. At the same time, however, there are strong signals that the book's hopeful message was not without cause.

The meeting of a few took place in early December 2007 when three unremarkable institutions assembled in Beijing for what was called "The U.S.–China Energy Security Cooperation Dialogue."¹ The groups were the Atlantic Council of the United States, a shadowy think tank of former government officials and executives primarily from the defense, fossil fuel, and nuclear industries; the Institute for Sino-American International Dialogue, an organization apparently steeped in academia, but staffed by former U.S. Defense Department and Atlantic Council executives; and the U.S./China Energy & Environment Technology Center, a group of researchers

from Tsinghua University (often called “China’s MIT”) and Tulane University, funded by the U.S. Department of Energy with the expressed purpose being to “develop markets for U.S. clean coal technologies.”² Several dozen representatives of these organizations met with current U.S. and Chinese government officials, a handful of renewable energy experts, and one environmental organization representative.

The meeting concluded, among other things, that “without a major refocusing of nearer-term efforts, the goals of dramatically improving the world’s energy security and environmental outlook by the middle of the century are not likely to be realized.” By itself, that may not seem revelatory, but the remainder of the meeting’s conclusions show that the United States and China had no plan to refocus “nearer-term efforts” toward solutions like rapid development of clean, renewable fuels, but instead had essentially agreed to bare-knuckle competition for—and unabated consumption of—oil, coal, and nuclear fuel for the foreseeable future. Somewhat more ominously, the group recommended that the United States significantly increase its Strategic Petroleum Reserve, the oil squirreled away for national emergencies, like war, in underground locations around the United States. At the same time, the meeting participants acknowledged the unstoppable force of “China’s growing role in world energy markets.”

The Beijing meeting was the petroleum equivalent of the Yalta Conference after World War II that divided the world between Soviet Union and U.S. spheres of influence, launching a four-decade-long cold war. To be sure, no world leaders participated and there were no Yalta-style public agreements in Beijing, but the groundwork may have been laid just as certainly. A few months before the meeting, the Pentagon concluded that the Chinese military buildup of recent years, including \$125 billion in 2006 alone, was largely intended to protect its oil interests around the globe. China now has at least nine hundred missiles, 1.4 million soldiers,

and lasers that could disable U.S. satellites, along with submarines and aircraft carriers to deploy those forces, all aimed largely at protecting Middle Eastern and African sources of China's oil supply.³

What is fanning the flames of this new petroleum-powered cold war? Literally, it is driven by cars. The U.S. appetite for SUVs and wasteful driving is well documented, but a glance in the rearview mirror of commerce shows the Chinese rapidly catching up. China recently became the world's second-largest car market (after the United States) and will likely surpass the United States in total vehicle ownership by 2025. More Chinese are commuting to work over longer distances than previously, just like their counterparts in Los Angeles or Houston, and their cars are getting bigger, too. In 2007, small car sales in China declined by nearly 30 percent, but SUV sales rose nearly 40 percent. "Purchasing power is rising, so it's simple—to drive a higher-end car gives you more face," said Su Hui, general manager of the Asian Games Village Automobile Exchange.⁴

Cars aren't the only drains on every drop of both crude oil and refined petroleum products. In the United States, where refineries work at capacity year-round to keep up with soaring demand, spills, blowouts, and mechanical failures strain the supply chain; indeed, 2007 set a record for refinery failures.⁵ Crude oil pumping has been frequently interrupted by nationalist uprisings in Nigeria and several Latin American countries, and annual Iraqi oil production remains a fraction of its potential long after the U.S. invasion in 2003. Not surprisingly, by early 2008 prices of a barrel of crude and a gallon of gas were breaking records almost every week.

Fewer than ten years ago, oil sold for \$10 per barrel and the *Economist* ran a feature story that warned that this value might not last, that oil might well fall to \$5 a barrel. In any case, the *Economist* asserted, the world faced "the prospect of cheap, plentiful oil for the foreseeable future."⁶ Not many experts make those predictions today when oil and gasoline prices are setting record after upward record.

The second event that augured ill for our future on the planet was actually a series of demonstrations in early 2008—riots, in some cases—in Haiti, Mexico, Bangladesh, and other third-world nations around the globe.⁷ Desperate people were in the streets with the rage of hunger in their bellies, among the most visceral of human emotions and responses, in this case brought on by oil. “This crisis could result in a cascade of others,” warned U.N. Secretary General Ban Ki-moon at the time, and it could “become a multidimensional problem affecting economic growth, social progress and even political security around the world.”⁸

The rapidly rising price of oil has driven up food prices, making food scarce and more costly in impoverished nations, in two fundamental ways. In many regions of the world, crop production depends on fuel for tilling, fertilizing, planting, harvesting, and transport to market. As the price of fuel for these activities rises, so does the price of food, but the real culprit in rising prices and falling supply that underlay the unrest is another insatiable appetite, signified this time by a rumbling of hunger from our gasoline tanks. “If you didn’t have ethanol, you would not have the prices we have today,” as Bruce Babcock, an economist director of the Center for Agricultural and Rural Development at Iowa State University, put it succinctly.⁹

The agribusiness lobby can challenge the oil and auto lobby for the title of the most powerful force in U.S. politics, as demonstrated by Congress in 2007 when it passed an energy bill that mandates the use of 9 billion gallons of ethanol in 2008, swelling to 32 billion gallons in 2022, the vast majority of which will be made from corn.¹⁰ Agribusiness lobbying is not limited to North American politics; the European Union set a target of 10 percent of all transportation fuels to be obtained from farm crops by 2020.¹¹ Not only does corn take substantial petroleum-based inputs to grow on an industrial scale, but converting it into ethanol uses even more fossil fuels. There is thus little benefit to the environment, and some corn ethanol cre-

ates more air pollution, including greenhouse gases, than burning petroleum-based fuels does. Moreover, conversion to biofuels has taken substantial pieces of land out of food production, further driving up prices. In 2008, at least 20 percent of the U.S. corn crop will be used for ethanol.¹²

Ironically, as evidence mounts that droughts in grain-exporting countries like Australia are the direct result of global warming, caused by our insatiable appetite for burning oil and coal, harvests decline and prices rise even further. With droughts added to increasing fuel costs and with conversion of crops to fuel, poor nations can no longer afford to buy what's left. Between 2005 and early 2008, for example, prices for staples like rice and wheat leaped 80 percent worldwide, while corn disappeared in many parts of the world at any price, unless you looked for it in the gas tank of the nearest SUV.

Defenders argue that any form of ethanol creates a market that can later be satisfied with more sustainable biofuels such as those made from switchgrass or farm waste materials. No commercial projects have yet delivered on those promises, however, so we are now cannibalizing our food supplies to keep our cars running.

The ill-fated residents of Easter Island, as described in the prologue, consumed the majority of their natural resources in a few generations for equally unsustainable diversions, like building giant stone idols, and were left ultimately with nothing to eat but one another. We, too, are rapidly cannibalizing an increasing inventory of our wealth to satisfy the God of Oil. In the spring of 2008, for example, families and businesses alike were spending so much more on fuel that every other economic endeavor was suffering. MasterCard reported that as consumers spent more on gasoline, they cut spending on everything from clothing to dining out. Across the United States, meat sales were down and Wal-Mart reported increases in the sale of peanut butter and pasta as people tried to balance household budgets. Even the sale of alcoholic drinks had

declined, although on the bright side, the sale of programmable thermostats was up as homeowners tried to reign in costly heating and air-conditioning expenses.¹³

We have cannibalized more than our food supply to get the next fix of oil. Our public health is also being sacrificed to this oil addiction. The latest in a long list of evidence on diseases and lives cut short is noteworthy for the collar-tightening conclusion that potent neurotoxins generated by jet fuel combustion were discovered aboard Boeing 777 aircraft during flight, according to air-quality investigators for the BBC. At least one family is suing over health effects they believe are attributable to this exposure.¹⁴ U.S. researchers recently found disturbing new evidence, too, that particulate matter—the ubiquitous soot that billows behind school buses and diesel trucks—combines in the atmosphere with other gases not only to cause illness and premature deaths, but also to contribute to more of our global warming problems than previously understood.¹⁵ And new evidence has been gathered about the effects of toxic fumes from cars and trucks. In a thirteen-year study of 3,600 children who lived within five hundred feet of busy roadways, researchers have now documented an array of illnesses as well as stunted lung growth attributable to these toxins.¹⁶

Perhaps the most breathtaking example of the “Easter Island effect,” however, is the cannibalization of Earth’s climate in service to our addictions to oil and other fossil fuels. Neither the United Nations nor the world scientific community is noted for reaching unanimous agreement on matters of great importance, but in 2007 academic representatives under the auspices of the United Nations made just such unambiguous declarations, finding that human-induced climate change, much of it from fossil fuel use, is a far greater problem than previously recognized. The U.N. Intergovernmental Panel on Climate Change (IPCC), comprised of scientific experts from more than 130 nations that review the status of climate change science, released findings that are as stunning for their sober-

ing conclusions as they are for their unprecedented level of scientific rigor and consensus.¹⁷

IPCC members found that humans are more than 90 percent likely to be the cause of global warming and that its effects are very real. They also found that we are rapidly running out of time, much as the Easter Islanders did two centuries ago. Before the IPCC's 2007 report, there were few doubters about the problem of climate change, with one notable exception—U.S. President George W. Bush—but in 2008 even he reversed his previous denials and called for action to reduce greenhouse gases.¹⁸

The third little-heralded event that may indicate the course of our future was another admission by Bush, this time that the war in Iraq was essentially about the control of oil. In late 2007, former chairman of the Federal Reserve, Alan Greenspan, said he believed that the war was entirely about oil.¹⁹ Greenspan was criticized by Bush administration officials for stating that view, but a year earlier Bush himself, with no fanfare or appearance of regret, admitted as much. "If we do not defeat the terrorists or extremists in Iraq," the president said in the course of a rambling monologue to reporters, "they will gain access to vast oil reserves."²⁰

Taken together with other statements cited in the pages that follow, President Bush has painted a clear picture that we spent a trillion dollars in just the first five years of war and occupation in Iraq to secure our next fix of oil. Of course, he had accomplices in the U.S. military and in Congress, but the unmistakable message is that our desperation for oil will drive us to pay previously unthinkable prices for many years to come.

Three events, with a shared petroleum pedigree, paint a disturbing picture for our future, but there is still a hope that so many lost lives per gallon may not be entirely in vain. The drumbeat grows louder every day for action to save the lungs of our children, the lives of our soldiers, our economic well-being, and our shared climate.

People across the world are fighting back, trying to hold accountable those who would keep us enslaved to oil. More than six hundred citizens of Tokyo sued automakers over air pollution and won a large settlement that included funding for health care and pollution abatement.²¹ Some states filed suit against the Bush administration for its failure to reduce airborne soot, mostly from diesel engines, to levels that would protect public health.²² Automakers lost their years-long battle to fend off California tailpipe regulations designed to reduce greenhouse gases, and the court fight was shifted to a lawsuit against the Bush administration for its failure to allow states to move ahead with these regulations.²³ In addition, the victims of Hurricane Katrina filed suit against oil companies, utilities, and others responsible for global warming that contributed to the destruction of the quality of life in the Mississippi Delta.²⁴

Although some don't think that the courts should be used to level the playing field, the defendants in these cases can certainly afford to help their victims. Exxon/Mobil alone has recorded the highest profits for any corporation in the history of commerce: \$40.6 billion in 2007.²⁵ If litigation forces oil companies to internalize some of the burden they place on the rest of the world, much good could also be gained by reducing the tax subsidies given these companies. Congress has been trying, although unsuccessfully thus far, to shift as much as \$14 billion of the more than \$100 billion in annual federal subsidies from oil companies to renewable energy development (see also Table 3.1).²⁶

Still more hopeful is the progress inventors and investors are making to bring alternatives to fossil-fuel-based products to the market, with or without the help of the incumbent industries and federal government. I must admit a feeling of pride every time I drive past a gas station in my Honda FCX, a hydrogen-powered sedan that in early 2008 was joined by the Honda Clarity, the world's first mass-produced hydrogen-powered car. I fill up at a sta-

tion in Santa Monica, California, where hydrogen is made from solar power, one of dozens of fueling stations on Governor Arnold Schwarzenegger's visionary Hydrogen Highway Network. Every other major automaker is following suit, with a growing fleet of cars, buses, and other hydrogen-fueled vehicles taking to streets around the world every day.

With gasoline prices skyrocketing, battery-electric cars are also making a comeback and more fuel efficient cars are outselling gas guzzlers. Hybrids and plug-in hybrids—cars that can run short distances on battery power alone, but also use a small gasoline engine—started to reach consumers in 2008.

Finally, even our political leaders have begun to take the oil addiction challenge seriously, with initiatives first taken in the early years of the new century not at the federal level but at state and municipal levels. Led by Schwarzenegger and California's Global Warming Solutions Act of 2006, bold leadership is blossoming in states with Democratic and Republican governors alike. By the summer of 2008, more than half the states had detailed blueprints to reduce greenhouse gas emissions comparable to what would be required of them if they were separate nations under the U.N. Kyoto accord on climate change.²⁷

Those states had also banded together in regional "cap-and-trade" networks and signed an agreement to work with the European carbon trading system to create a truly global solution to the climate challenge, a solution that harnesses the forces of the marketplace just as we did in the United States to tame acid rain and lead in gasoline. To the extent that the Bush administration resists active participation in international climate change agreements, as the world meets to replace the Kyoto accord (which expires in 2012), the notable absence of the United States will be backfilled by full participation from visionary governors.

To be sure, none of it is easy, but we have faced massive change before and risen to meet that challenge. Imagine it's one hundred

years ago, 1908. You're starting an ice-cream business. You are planning to build your factory and illuminate it with gas lamps, store the ice cream in ice boxes, and deliver the ice cream to stores with a fleet of sparkling-new horse-drawn buggies.

Your young plant manager says let's use this new electricity thing to light the factory and to power this other new technology called refrigeration. Let's buy horseless carriages powered by gasoline to deliver the goods. Let's get one of these telephone things (soon everyone will have them, he says!) and take orders at the speed of sound. He says that we should do it to be competitive into the future because he can see the end of those old technologies and the dawning the new. What do you do?

Looking back at the years after 1908, it is evident that profound change can happen relatively quickly and that we can adapt. Today, that young man or woman would likely come to you and say let's use solar and wind power on the roof of our new green-certified building. Let's take excess power from that roof to convert water into hydrogen for powering our forklifts in the warehouse. Let's make the delivery vans compressed natural gas or biofuel or hydrogen powered. And let's measure and register our reduction of greenhouse gases and sell the credits to some poor fool in the near future who wasn't smart enough to do these things today.

Just as technology helped launch the Industrial Revolution in the nineteenth century, technology can help unleash the power of renewable energy, increased energy efficiency, and alternative methods of transportation that would launch us into a Cleantech Revolution of the twenty-first century and beyond. Although there are lessons to be learned from the past, today's challenge is unique because this time we're trying to save more than a little manual labor. The changes we make today will determine the quality of life on this planet and the very foundations of our economic prosperity.

In fact, if we challenge all our horse-and-buggy thinking, we can

improve almost everything we use, even common products you'd never suspect could be "green." For example, a company called iGPS makes plastic shipping pallets. A simple, out-of-sight, out-of-mind product, wood pallets consume forests, and most end up in landfills. The iGPS pallet lasts far longer and weighs about half as much as a wood pallet, so it saves fuel on each shipment and therefore cuts pollution and greenhouse gases. Best of all, if a plastic pallet ever breaks, it can be ground up and made into a new pallet, endlessly recycled.

Each of us can make a difference too, whether it's driving more fuel-efficient cars, taking mass transit, or being an early purchaser of a hydrogen or electric car. We can also do simple things with multiple benefits, like changing incandescent lightbulbs for compact fluorescent or LED bulbs, or even going on a diet. A diet? In the past ten years, the average American has gained ten pounds (myself included). Carrying around all that extra weight has meant that U.S. airlines must burn an extra 350 million gallons of jet fuel every year.²⁸ So if all us thick-in-the-middle Americans lost a few pounds, we'd feel better and so would the world!

We must also make our voices heard in the voting booth and by voting with our wallets, demanding alternatives to fossil fuels. Coal, oil, and uranium are "elite fuels," controlled by a few and limited by nature, but we all have unfettered access to the sun, wind, things that grow, moving water, and other clean, inexhaustible, renewable sources of energy. That's not just smarter, it's democratic. Businesses run on energy, and so by democratizing our energy supply, we democratize our economy and thereby inspire others to democratize theirs.

In *A Christmas Carol*, the Ghost of Christmas Past shows Scrooge a bleak future and his own death, mourned by no one. The old miser asks if this vision is of what must be or if it is of things that are still within his power to change. Upon awakening from his tormented night's sleep, he realizes that it is the very last moment to alter his

future, but that indeed there is still time. He takes decisive, positive action.

Will some future history book be able to conclude the same about us in making the world a better place for all living things as Dickens did of his reformed sinner—God bless us, every one?

Notes

- 1 "Report on U.S.–China Energy Security Cooperation Dialogue," Atlantic Council of the United States, Institute for Sino–American International Dialogue, U.S./China Energy & Environment Technology Center at Tsinghua and Tulane universities, Beijing, December 11–12, 2007.
- 2 See websites for each organization: <http://www.acus.org/about-people-board.asp>, <http://www.du.edu/gsis/isaid/about/> (AU: website not functional, pls check), and http://fossil.energy.gov/international/International_Partners/China.html
- 3 "Annual Report to Congress: The Military Power of the People's Republic of China 2006." Available online at <http://stinet.dtic.mil/dticrev/PDFs/ADA449718.pdf>.
- 4 Robert Collier, "China's Latest Boom: Buying Cars—Big Cars," *San Francisco Chronicle*, August 18, 2007.
- 5 Jad Mouawad, "Record Failures at Oil Refineries Raise Gas Prices," *New York Times*, July 22, 2007.
- 6 "Drowning in Oil," *The Economist*, March 8, 1999.
- 7 Anthony Faiola, "The New Economics of Hunger," *Washington Post*, April 27, 2008. Author Michael Klare is an excellent resource for more information on the dynamics of oil, food, politics, and global competition for resources. He is a professor of peace and world security studies at Hampshire College and author of *Rising Powers, Shrinking Planet: The New Geopolitics of Energy* (New York: Metropolitan Books, 2008).
- 8 Faiola, "The New Economics of Hunger."
- 9 Faiola, "The New Economics of Hunger."
- 10 Ben Lieberman, *Time for Second Thoughts on the Ethanol Mandate* (Washington, DC: Heritage Foundation, April 2, 2008).