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All About the Oil Sands

*He that will not apply new remedies must expect new evils,
for time is the greatest innovator.*

—Francis Bacon

Hard-hatted, I'm standing in the middle of a reeking moonscape of black bitumen-coated sand. Around me are enormous diesel haulers and an old electric shovel that has had its day. It's a hot afternoon and the stuff the engineers refer to as "dirt" stinks like the fresh asphalt I poured in my driveway last June. I pick up a bit of the dirt—it's soft, moist, and a bit sticky. My feet even sink gently into the stuff. Later, I find the leather soles of my shoes are spotted with oil.

Everything is big in the Athabasca Sands. Landing in the main Syncrude site is like being inside a giant crater on another planet. The colossal yellow Caterpillar 797Bs that can each haul 400 tons of oil sands from the shovels to the separation plant, are the biggest trucks money can buy. Each one has the horsepower of a hundred pickup trucks. They're monster versions of the yellow Tonkas my sons had in their sandbox. Fully loaded, they weigh more than two Boeing 747s. Each 400-ton run delivers enough dirt to make about 200 barrels of oil, or 1,000 U.S. gallons (3,785 liters) of gasoline.

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To get up into the cab, I have to climb fifty feet (15.24 meters) up a welded steel staircase of twenty steps. From the top, the landscape appears lunar—a lumpy black asphalt field stretching to the horizon—and over to the east, the greasy sludge ponds kept in by a monstrous tailing dam—the largest in the world by volume—standing as high as a house. Beside the plant, the eye is drawn to the neatly stepped pyramid of shocking yellow sulphur, a by-product of synthetic crude, to be shipped out to make fertilizer.

Like the tar that pools out of road asphalt on a blistering hot day, liquid bitumen has always oozed out of the high banks of the Athabasca River for as long as native people can remember. In summer, it can stick to your boots; in winter, you can burn it like coal. Also called pitch, bitumen is the heaviest of the naturally occurring crude oils, a hydrocarbon with most of the hydrogen missing.

The driver says it's a lot different here in the winter when blizzards roar up the valley from the Arctic Circle. Take some molasses and put it in the fridge for a few hours. Then try to pour it. Nothing much happens. That's raw bitumen, as thick and sticky as cold blackstrap molasses. But try and take it out of the ground when the temperature is 58 degrees below 0 Fahrenheit (negative 50 Celsius), and it is as hard as rock.

On a hot June day, with sweat trickling down from under my Syncrude hardhat, I try to imagine working here in January, on a windswept landscape where it's so cold that diesel fuel freezes to the consistency of Vaseline, and light engine oil becomes as hard as grease. In the worst days of winter whiteout, you have to keep the engines of these heavy haulers running twenty-four hours a day. If you let the engine stop when it's that cold, you might not be able to start it again until the spring thaw three months later.

The black gold rush currently taking place in the Sands of the Athabasca is the biggest industrial project on the planet. The Sands are not pretty and the climate can be brutal, but for the people who

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work here mining the Sands, steaming the oil off underground deposits or just servicing the big operators, it's a chance to strike it rich in a modern-day Klondike.



If energy is supposed to be the master resource of the human race, then Canadians are truly blessed. Beneath the boreal forest of Saskatchewan and Alberta, halfway between Edmonton and the border of the Northwest Territories, lies a black bonanza of oil-soaked sand, with more petroleum than the entire Middle East.

It's hard for people to grasp this simple fact—the bitumen and heavy oil of the Canadian provinces of Alberta and Saskatchewan are the largest known petroleum assets on the planet. Covering an area larger than England, this belt of oil-soaked silicon dwarfs the light oil reserves of the entire Middle East. According to Clive Mather, former head of Shell Canada, “We know there's much, much more there. The total estimates could be two trillion or even higher. This is a very, very big resource.”

However, this treasure chest lies in rich moist layers that are not ideal for extraction. Over the past twenty-five years, a posse of chemists, geologists, and drilling service companies have spent millions on research to come up with new underground wizardry that will eventually allow us to extract at least one trillion barrels from the 80 percent of the Sands which are too deep to be mined.

On the surface, the strip miners have also refined their technology, cutting their costs, and squeezing out synthetic crude by using less and less heat and water. Over the next few years, they are being forced to apply themselves to drying out and reclaiming the giant tailing ponds that have so disfigured the landscape and caused so much hand-wringing from green activists around the globe.

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The below-ground producers have a much smaller footprint, using an amazing new process—steam assisted gravity drainage or SAGD—invented by Calgary chemist, Roger Butler, to gently coax the oil from the sand. These producers use less energy and, in some cases, are completely recycling heat and water. Some of them use underground combustion or electricity rather than steam to warm the bitumen underground. Others are using solvent to reduce the need for both water and energy for steam. Some are working out completely closed-loop systems, making their own steam from the energy below. Underground extraction uses a great deal of steam and natural gas is still the major fuel source, but massive new discoveries of gas are coming onstream in North America and these will keep the costs in line.

In fact, most production and “lifting” costs in the Sands are not out of line compared to conventional oil and far cheaper than offshore drilling, plus there is no exploration cost to pay.¹

It’s a huge undertaking. Companies that want to tap into the bonanza of the Sands are forking over billions of dollars every year in capital costs and have spent over \$1 trillion to date. In the past twenty-five years, the Sands have generated an economic impact in GDP terms of more than \$3.5 trillion across Canada.

Apart from conventional crude and natural gas, the Sands alone have paid federal taxes of over \$200 billion, and provincial taxes and royalties of more than \$300 billion.



We need this oil, but with all the media reports about global warming and peak oil, we’re stricken with a strange kind of neurosis. While we sing along with Joni Mitchell when she complains that we “pave paradise and put up a parking lot,” most of us have no

¹Crude Oil Production Costs and Crude Oil Production (U.S. Energy Information Administration); Web Support Site, *Black Bonanza* Footnotes—Chapter 1. < * >

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intention of returning to a medieval lifestyle or taking up hunting and gathering in the boreal forest or some other “Garden of Eden.” Clearly there is little popular support for shutting the Sands down, and yet there is a strong demand for more environmental stewardship in the Sands, an issue that is finally being addressed.

Our way of life requires fossil fuel and we will need it for at least another half century, or until we develop alternative sources for powering our lifestyle. The Sands are bountiful. They offer a stable and secure supply for North America that no other country in the world can match. After fifty years of tinkering and innovation, operators can produce synthetic crude out of the Sands at a price that is getting comparable to conventional crude and less than offshore oil.

The U.S., in particular, needs this oil—imports from Canada have doubled over the past decade. Canada now fills about a quarter of the U.S. oil needs, exporting over 80 million barrels a month, almost as much as Saudi Arabia, Venezuela, and Nigeria combined.²

Let’s be realistic. In spite of all the protests and complaints, we will never summon the political will to shut down oil operations like the Sands, because we want to secure and maintain our standard of living. So where does this black bonanza leave us in terms of our energy future and security?

First of all, the price of oil is one of the governors of the world economy, and, perhaps, the most important price of all. The more oil we can deliver, the more able we are to keep the price stable or at least reasonable. No one wants to go back to 2008 when the oil market went mad, whipped by speculators and out-of-control hedge fund trading. Panic drove the price of crude up to a stratospheric \$148 a barrel at the peak. The crash, when it came, was severe and the price landed with a sickening thud at \$38 a barrel.

²U.S. Imports by Country of Origin; Web Support Site, *Black Bonanza* Footnotes—Chapter 1.
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Today, unless there are any foolish speculators around who want to get burned all over again, the price seems to have stabilized in the mid \$70s. It shouldn't go too crazy again until the lead bulls can generate another crude stampede.



Some people describe the Sands as dirty and nasty, but I would like to make a pitch for bitumen, because it is one of the true markers of our civilization. Neanderthal cave people first used it to glue flint tips onto their spears. Three thousand years ago, the Mesopotamians valued it highly for waterproofing boats, bricks, cisterns, water pipes, and pottery, and it was a sought after trade good throughout the Middle East. Indeed, it was essential for their way of life and very survival, as their climate warmed and dried.

Bitumen played a big part in early human religion as well, from caulking Noah's Ark, to building the Tower of Babel, to the fire and brimstone that destroyed Sodom and Gomorrah. I find it fascinating that some of this religious sentiment was inspired by a kind of guilt and envy about power that persists even today.

Ancient priestly complaints from the Bible are eerily similar to the moralistic essence of today's environmental creed—that our oil-fueled civilization is an affront against nature. Today's climate crusade is based solidly on the age-old attack by priests and religion on the follies of human civilization, technology, and pride. Back in the time of Babylon, it was the Tower of Babel that was the enemy; today, it's technology, overpopulation, industry, America, the human race, and now the tar sands of the Athabasca.



At about the same time as the Klondike gold rush lured prospectors to the Yukon, the Sands became a magnet for seekers of black gold.

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In fact, for the first half of the twentieth century, the Athabasca Sands were like the Klondike, except in slow motion. Very slow motion.

In the case of the Athabasca Sands, there was no stampede and no panic to get at the treasure. No more than fifty prospectors and drillers came to the remote Athabasca frontier over a forty-year period before World War II. All of these starry-eyed dreamers went broke, including a dashing German aristocrat named Alfred von Hammerstein. But they believed they had the chance to strike it very rich by finding a large pool of crude oil, or at least make a modest buck by producing barrels of tar or by mining the Sands to pave the muddy roads of the Canadian Prairies with Athabasca asphalt. And they made some progress in understanding the riddle of the Sands. The Athabasca River was not Bonanza Creek, and bitumen-soaked sand was not gold dust. At least not at that time.

The main problem faced by early pioneers was the huge extent of the boreal forest that surrounded the Athabasca River and tributaries. The Canadian portion amounts to 1.4 billion acres (5.7 billion square km), but the Athabasca Sands underlays only 35 million acres (142,000 square km) or one-fortieth of the total. The mineable portion is under 0.1 percent of the whole boreal ecosystem. So, Canada's boreal forest is, at its heart, huge and indestructible. It's a deep green desert that will never be populated to any extent, and the Sands are only a surface scratch that will ultimately heal.

While most critics of oilsands development focus on its impact on the natural environment, and some decry the "destruction of the boreal forest," I don't buy the argument that the industry will destroy this ecosystem. Believe me, there is an almost endless supply of boreal forest up there, and a friend of mine almost died in its vastness.

Years ago, some friends and I were on a prospecting job in the Northwest Territories to pay our university fees. We were doing

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geophysical exploration south of Great Slave Lake, a three-day walk from any other human life. Flying over it, the Boreal Forest is an enormous green ocean. Down on the ground, it was an endless landscape of short, scrubby spruce, peaty muskeg, grey green reindeer moss, swamp, and shallow lakes, some of them with springs of warm sulfur-smelling water. One of my friends got lost, and it took a day to find him. He was smart. He stayed still until he could hear us shouting.

My friends and I got there in mid-June, when there was twenty-four hours of daylight and the forest was alive. We heard moose crashing through the spruce, and saw countless songbirds, sandhill cranes, and great horned owls. We kept our meat in a hole in the ground. Five feet down there was frosty soil, as cold as a beer fridge.

It was truly the kingdom of the mosquito. We worked with head nets and went through cases of insect repellent. Even the Dene guys we worked with, who claimed their blood was 5 percent mosquito venom, said the modern stuff was a hell of a lot better than bear grease. We prayed for a breeze off Great Slave Lake to chase away the flies. Most nights I drove the Bombardier muskeg tractor down to the lake for an icy cold swim and to fill the water barrel.

Suddenly, we had a frost in August and the bugs were gone. Then we had deepening darkness at night as our part of the planet shifted its gaze away from the sun, and then the shimmering green curtains of the aurora borealis lit up the sky, as cosmic rays, directed by the earth's magnetic field, slammed into the atmosphere above us.



The earliest oilsands development started after World War I, when Canadian government surveyor, Sidney Ells, mapped the richest Sands deposits, and Karl Clark of the University of Alberta worked

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on extracting 100 percent clean bitumen and building the first pilot plants.

The need for oil and asphalt exploded in the twenties, as the automobile came of age and the Sands soon lured in various wealth seekers, including a group of New York City policemen who were convinced the Athabasca forest hid an enormous oil field. They lost their shirts. The North West Company Ltd., an Imperial Oil subsidiary, drilled a few wells in the Sands and found nothing. A Prince Edward Island promoter named Robert Fitzsimmons set up a small bitumen plant and sold barrels of the stuff to hardware stores as roof tar.

The first serious investor in the Sands was an enigmatic American geologist named Max Ball, who had advised Shell, Esso, and the White House, and was author of a lively bestseller called *This Fascinating Oil Business*. With some partners from Toronto, he built a small plant that actually produced diesel fuel and gasoline. The Canadian government took it over as a wartime reserve to supply U.S. troops in Alaska. Interest lagged after World War II, but with U.S. reserves starting to decline and “peak oil” worries rising, it took a Philadelphia oilman named J. Howard Pew, head of the Sun Oil Company, to make the final leap to large-scale production. His Great Canadian Oil Sands (GCOS) mine, which opened on September 30, 1967, burned through over \$250 million before it started making a profit. Today run by Suncor Energy, the GCOS was the world’s first complex dedicated to mining oil sands and upgrading bitumen into synthetic crude oil.



In the 1970s, OPEC and the oil crisis caused prices to balloon, and suddenly the Sands made a lot more sense. The governments of Alberta and Canada also wanted a bite of the bonanza, and started an escalating ten-year war for control that saw the creation of government oil companies—Alberta Energy Company and

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Petro-Canada—and then a terrible collapse of business when the world price for oil plunged.

But the crisis pushed the companies in the Sands to innovate in order to get costs down, and when the happy days returned, their profits mushroomed.

The riches of the Sands also brought the U.S. to the free-trade table, something Canada had been urging for a century. The Canada-U.S. Free Trade Agreement gave the U.S. the petroleum price and supply security it needed, and the two countries agreed not to bring in any tax or duty that would favor one country over the other. Either party could bring in energy supply restrictions or price hikes as long as it kept the same price or percentage of supply for the other party. The 1994 North American Free Trade Agreement (NAFTA) went even further, limiting export/import restrictions, keeping the proportion of energy exports relative to total supply, and avoiding dual pricing.

The Sands came of age in the early 1990s, when the new Alberta Premier, Ralph Klein, took most of the brakes off oilsands development. Canada soon had three major mines in operation, and suddenly the country had joined the exclusive club of energy superpowers.



A former newspaper reporter and Liberal mayor of Calgary, Ralph Klein was no green groupie, and under his fourteen-year reign the oilsands business barreled ahead. Generous write-offs and a new tax and royalty rate led to the spending of billions of dollars a year. It was, perhaps, the biggest industrial boom in Canadian history. In a part of the country used to boom and bust, the governing mantra was “make hay while the sun shines.”

While oilsands mining went flat out, Klein and the companies also directed a whole whack of money toward oilsands research,

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mainly at the universities of Calgary and Alberta, but also on site, where oilsands operators invested in automating production, and in improving water recycling and heat exchange bit by bit. All this research cash soon gave birth to a raft of new technology start-ups that tried to exploit promising patents and innovations. The greatest of all of these new inventions was SAGD (pronounced SAG-D), which is turning into one of the key breakthroughs in energy history.

But the good times had a downside. The tailing ponds of the mines grew wider, and the companies slacked off on their promises to reclaim the mined land, so that today, the governments are forcing the oil companies to play an expensive game of catch up. The tailing ponds also alarmed many environmental groups, including Alberta's Pembina Institute, who expressed concern about leakage into the Athabasca River or even the breaching of a dyke, which could seriously damage the entire Athabasca-Mackenzie River watercourse. A doctor downriver at Fort Chipewyan found rare cancers that he suggested could be caused by toxic compounds leaking from the ponds. While an Alberta enquiry absolved the Sands' operators, the issue is still a "he said-she said" battle. The issue needs further research, and matters are complicated by the fact that there are also four pulp mills upstream from the mines as well.

What really changed the attitude of many citizens toward the Sands was the rapid growth of a movement against global warming caused by the burning of fossil fuels, which releases carbon dioxide (CO₂). The fascinating thing, and one I devote a chapter to in this book, is why the Sands, a bit player among emitters, became such a symbol for the environmentalists, when other CO₂ sources are far more significant. The story has many twists and turns, but inevitably comes down to money and power. A lot of individuals and groups directly benefit by focusing on the Sands, and ignoring other global warming villains.

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So suddenly, it was “Tar Wars” time, as the Sands morphed into something akin to the kingdom of Mordor in Tolkein’s *Lord of the Rings*, and a talisman for sophisticated attacks on the energy business as a whole.



We’re being asked to wager trillions of dollars and substantially curtail freedom on climate models that are imperfect and unproven.

—George Will, *Washington Post*

The world’s biggest industrial project started to attract world-class attention in about 2005. At one end of the spectrum, Bill Gates and Warren Buffett jetted up to the Athabasca in the summer of 2008 to check on their investments. At the other end, the Sands were visited regularly by Greenpeace eco-warriors, eager to hang their banners on heavy haulers. Soon, a succession of green groups were making the pilgrimage to Fort McMurray and flying over the Sands, so they could report back on the devastation done by the world’s ugliest mines.

The mainstream green groups were determined to portray the extraction of oil from the Sands as bad for the environment, and some went as far as to demonize the Sands as a modern day Mordor for questing green hobbits. Why? Because in reality, trashing the tar patch shored up their fundraising activities and helped their bottom line. The Sands are monumentally ugly, and they are far enough away from big population centers so donors can’t look too closely at the message. Besides, “Blame Canada” is a tried and true slogan in the U.S.

All this attention led Al Gore and others to ramp up the demonization of the Sands even further. In a speech in Toronto in the fall of 2009, Gore pulled out all the stops saying that, “the oil sands threaten our survival as a species.”

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So what's with the apocalyptic language? Who is benefiting from these over-the-top attacks? And what are the oilsands companies doing to combat the counter the demonization?

In this book I argue that the oilsands companies are ill prepared to fight what has turned out to be the mother of all public relations battles. The Sands have become the poster child for "environmental Armageddon," but the companies have little response. They take a reactive rational approach when what they are facing is nothing less than a new religion determined to defeat them in a last battle, a "Tarmageddon" if you will.

Apart from the young hearts and rich foundations arrayed against them, the Sands operators are also facing a growing and formidable phalanx of new companies determined to tithe the energy industry and use tax breaks to build alternative and sustainable energy projects.

In some ways, global warming is just a sideshow. Paleoclimatologists show convincingly that Earth's climate has been changing naturally for millennia before the Medieval Warm Period (800 to 1300 AD), when temperatures were higher than today, and the Little Ice Age (1500 to 1850 AD), when temperatures were lower, and no climate prediction models can infallibly map the distant future. Indeed, as the recent release of the "Climategate" e-mails and documents from the influential Climatic Research Unit (CRU) at the University of East Anglia show, the current models are enormously crude.

Climate "deniers," or as they like to call themselves, "climate realists," are clearly in the ascendant, even though the global warming crusaders endlessly taunt them as being "shills for big oil." Ironically, the "Climategate" e-mails show that the CRU fundraisers had no problem with big oil, and actually met with Shell Oil environmental officials to enlist them as strategic partners, while getting them to bankroll pro man-made global warming research. The e-mails also reveal that the CRU was trying to get research grants from oil giants British Petroleum and

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Exxon-Mobil. All three companies are enthusiastic operators in the Athabasca Sands.

Even the famous “hockey stick” graph used by the United Nations’ Intergovernmental Panel on Climate Change (IPCC), and heavily featured in Al Gore’s movie, *An Inconvenient Truth*, has been thoroughly debunked by retired Toronto mining engineer and statistician Steve McIntyre.

But the demonization continues, and now it is Canada that is under the spotlight. The country “is the dirty old man of the climate world,” according to a recent *Guardian* article. The most pious of the global warming pundits, George Monbiot, wrings his hands when he thinks of what a nasty country Canada has become:

When you think of Canada, which qualities come to mind? The world’s peace-keeper, the friendly nation, a liberal counterweight to the harsher pieties of its southern neighbor, decent, civilized, fair, well-governed? Think again. This country’s government is now behaving with all the sophistication of a chimpanzee’s tea party.

I am watching the astonishing spectacle of a beautiful, cultured nation turning itself into a corrupt petrostate ... Canada is slipping down the development ladder, retreating from a complex, diverse economy towards dependence on a single primary resource, which happens to be the dirtiest commodity known to man.

Until now I believed that the nation which has done most to sabotage a new climate change agreement was the United States. I was wrong. The real villain is Canada. Unless we can stop it, the harm done by Canada in December 2009 will outweigh a century of good works ...

Various diplomats have taken up Monbiot’s moaning cry, calling for Canada’s expulsion from organizations like the Commonwealth because it failed to meet its commitments under the 1997 Kyoto Climate Change Treaty. But neither have the Europeans, in spite

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of some creative climate accounting, emissions trading, land-use changes, and carbon offsets.

All of this is happening while the emerging problem may, in fact, be global cooling. Ecologist Peter Taylor has shown that the jet stream shifts south as the magnetic field of the sun falls, and this was characteristic of the Little Ice Age. In 2007, the sun's magnetic field fell to an all-time low and this repeated through 2008 and 2009. So, we may need the energy from the Sands more than we realize.

Polls still show that most people in Canada don't buy the demonization and support continuing to work the Sands. U.S. and British pollsters are also finding out that "climate fatigue" and the recession have combined to cause the global warming scare to retreat down to the very bottom of peoples' concerns.

Stepping back from the spin, it struck me that perhaps all these attacks and the demonization of Canada and its oilsands bonanza are one way of distracting Americans and Europeans from the problems in their own back yard. U.S. coal-fired electricity (some of which is sold to Ontario) is immensely more polluting, and produces forty-four times more CO₂ than the Athabasca projects. Mountaintop removal in the Appalachians does far more damage than tailings ponds in the Athabasca.

I have also come to the conclusion that genuine environmentalism went into the ditch when the pollution debate was gradually reframed along one obsessive line—global warming. An eager Al Gore, together with market makers who want to build a global climate exchange using cap-and-trade systems, have ended up monopolizing the green agenda. But after a decade of intense lobbying, they too are starting to fail, and *Financial Post* editor, Terence Corcoran, suggests a reason why: "Carbon trading is an economic black hole, a high-risk pseudo market set up around an orchestrated shortage for a largely unmeasurable, naturally occurring thing called carbon dioxide." It's also clear that a market that is not based on rational needs, but rather government policy

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is ripe for exploitation. According to Europol, the perils of making a market on hot air are very real—carbon trading fraudsters may have accounted for up to 90 percent of all market activity in some European countries, and criminals have got away with an estimated €5 billion, mainly in Britain, France, Spain, Denmark, and Holland.

The shame of it is, we have real pollution, starvation, and public health issues that desperately need to be solved, and we may have just wasted fifteen or twenty years and billions of dollars that could have been used to attack these problems.

Instead, we have green evangelists urging us to accept carbon taxation as a real solution, when we should be changing to hybrid vehicles, demanding higher mileage, teleconferencing instead of using jet planes, and saving energy rather than wasting it. We have been programmed to obsess about global warming and spend fortunes on controlling minuscule temperature variations, when we should be making simple lifestyle choices to reduce pollution in general.

In spite of all the spin people are exposed to today, and growing climate fatigue, there is still a definite will to improve the environmental footprint of Canada's oilsands industry, diminish the tailings problem, and restore a scarred landscape. And this is finally being dealt with, as I detail later in this book.

Global warming has been a lucrative crisis for certain sectors for the past twenty years, and nourished whole generations of policy-makers, interest groups, and organizations that thrive through public fundraising. For many people, the argument mirrors the debate in their own souls between the green of the earth and the bonanza of wealth we enjoy from using fossil fuels. But now we're seeing an entirely new energy scare emerging to take the focus off pollution and global warming. It's another issue that its devotees say threatens human civilization itself—the phenomenon of peak oil.



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Extraordinary claims require extraordinary proof.

—Carl Sagan

Back in the 1980s, I was told by a prominent Alberta oilman that there was more oil in Alberta than in the entire Middle East. It turns out we have quite a bit more – over 1 trillion barrels that is recoverable, 3.3 trillion barrels in total. So why are we wringing our hands about peak oil?³

The peak oil theory was first put forward in the 1950s by Shell’s lead geologist, King Hubbert, who made the shocking prediction that U.S. conventional oil output would peak in the early 1970s, and thereafter decline, making the U.S. increasingly dependent on foreign oil. Hubbert was right on the money about America, formerly the world’s number-one oil exporter, but he was wrong in his other prediction—global oil production would taper off after 2000. But only because he lacked clear statistics and did not factor in Canada’s Athabasca Sands. He also did not factor in 3 billion new players—the Chinese and the Indians—who were not in the market until the year 2000.

It all depends on what you mean by “peak.” Outside fortress North America, the oil business is still a “Mad Max” kind of world, with supply scrambling to meet demand, with bullies, dictators, and thugs holding sway over cowering citizens, and with national oil companies (NOCs) used as personal banks by the local ruling kleptocracy. At the same time, oil-poor nations like China and India are thumbing their noses at UN-mandated emissions targets and enthusiastically adopting a fossil-fuel-based lifestyle.

Some petro-pessimists, including those who also buy into global warming, tell us with the utmost confidence that the crunch is already here, and we’re entering a real age of scarcity on the road to ruin. They say our fossil fuel civilization is toast, because

³For an excellent summary of the peak oil debate, see the video, “A Crude Awakening”; Web Support Site, *Black Bonanza* Video—Peak Oil < * >

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world crude oil production has passed its peak, and we're not finding enough oil to replace what we're consuming.

Even most oil analysts still maintain the strange fiction that the Athabasca Sands are second only to Saudi Arabia in recoverable oil reserves. This fiction persists in the face of growing evidence that the Athabasca Sands are far larger. A trillion barrels of synthetic crude is four times greater than Saudi Arabia's 250 billion-odd barrels of conventional oil, and the 175 billion barrels that the International Energy Agency estimates for Canada as a whole.

For many Americans, Hubbert's peak oil theory is a terrifying prospect and one that could rock their whole way of life. For others, the scenario is pleasing, because our seemingly insatiable demand for fossil fuel is morally wrong and scarcity will force us to switch to windmills and biomass for fuel.

Suddenly, new horizontal drilling technology has ridden to the rescue, giving the world a gas glut and an elegant new way to exploit heavy oil and oilsands deposits. Roger Butler's SAGD means another hundred or so years of energy security that we never thought we had.

Now, many people attracted to the peak oil crusade are lowering their placards and going home. The apocalypse has been put off for at least another century. Energy economists have suddenly discovered that Hubbert's Peak is just a ragged plateau—that scary-looking downward roller-coaster slope of Hubbert's bell curve has significantly flattened out.

The Sands of the Athabasca will help insulate us from the shock of temporarily higher prices. The Sands are also a lifeline for North America and the rest of the world, until we engineer technology that can tap the powerful radiation of the sun.

Still, the threat that one day the planet's oil resources will run dry is very real, and it's obvious we have to work toward true energy independence. But the rewards of getting there are great—we'll finally be free of the peak oil threat, price manipulation by dictators and scoundrels, soaring and crashing oil prices and the

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roller-coaster ride of booms and recessions, and the risks of famine and petro-conflict. The U.S., in particular, will free itself of having to spend up to \$2 billion each and every working day to buy imported crude.

The blessing of the Sands is that they give us the luxury of time. After the oil shocks of the past thirty years, the Sands give us the chance to plan what I describe as the “Blue Shift,” to adopt new power technologies and get to the other side of any energy security minefield the world may have to cross.

So what are the best ways to make the Blue Shift, and how do we get there?

Smart investors like Warren Buffett, the Oracle of Omaha, are already preparing their portfolios for the Blue Shift. Buffett, who believes all cars on the road in 2030 will be electric, has already invested in a Chinese company working on the technology to make it happen.



“Blue is the new green” and blue is where the future lies.

We’re a race that runs on oil. A cheap supply of energy, first wood and wind, then coal, and now oil and gas, has given humanity a whole new way of life. With some exceptions, the Age of Oil has given us countless blessings, but the wells of fossil fuel will one day run dry. We have probably a fifty-year window of security made possible by reserves like Canada’s oilsands. But even before that time, even in the next decade or two, we should be able to make what I call the Blue Shift into an abundant new energy future.

U.S. futurist Ray Kurzweil has a theory that innovation proceeds on an exponentially rising curve and that we are well into the curve for getting economical energy from the sun. Applying his Law of Accelerating Returns, Kurzweil calmly predicts that solar nanotechnology will produce all the energy needs of Earth’s

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people in just twenty years. “If we could convert .03 percent of the sunlight that falls on the earth into energy,” he says, “we would meet all of our projected needs for 2030.”

Many people are now getting the point that solar energy freedom is just around the corner. Blue post-environmental activism is now emerging and it’s not just a word shift from green to blue. Tens of billions of dollars are being invested in blue research and development, in a race to come up with the cheap and scalable clean energy that we need. You can see it in California where most of the world’s trends start—savvy venture capital companies in Silicon Valley are shifting their focus from computing to renewable energy, the cheap generation of electric power, and, of course, super cool battery-powered vehicles like the Tesla. That’s where the future is, and that’s where the fun can be found.

The emerging Blue Shift should take us gracefully out of the age of oil, and usher in an era of super abundance right out of a science fiction novel. It’s perhaps ironic that solar energy will eventually replace crude oil and natural gas as the fuel that powers the world, but we should be thankful that plentiful hydrocarbon resources like those found in the Sands will let us make the transition without stress and violence, without the risk of apocalypse, or the collapse of liberal democracy.

The major danger in the shift to blue is having enough petroleum to keep fueling the global agricultural revolution so that we can avoid the specter of large-scale famine. World food production today is heavily linked to fossil fuels and inorganic fertilizer. The biggest risk right now is not peak oil; it’s maintaining the equilibrium, and we must do it by ensuring the production of secure energy supplies and food at a reasonable price, and by ramping up solar technology. This is no time to be taxing carbon and shoving people into poverty. That issue should wait until climate science is more settled.

You would think that the arrival of nanosolar and other blue technologies could put Canada’s synthetic crude on the road to

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obsolescence. But things never happen that quickly. Synthetic crude from the Sands is just a great insurance policy for North Americans and an immense future resource for petrochemicals and other uses of fossil energy.

Even if you're the most dedicated of climate lemmings, ready to follow Al Gore anywhere, you'll have to agree with me that we need to make a smooth transition from the Age of Oil to the new Solar Era. The Sands will help us get there.

One hundred years ago, as the Age of Oil was just beginning, Canadian drillers working for the Anglo-Persian Oil Company (today's BP), struck the first oil in the Middle East at Masjid-e-Soleiman in present-day Iran. One hundred years ago, an Ontario driller named Eugene Coste spudded the first gas well in Alberta. And one hundred years ago, a passionate young Canadian government geologist named Sidney Ells arrived in the Athabasca Valley to do an inventory of the Sands and bring out samples for study. Today, a century later, we are poised to enter another more permanent energy era, the Solar Age, and we'll get there easily, with the help of an ocean of bitumen laid down 100 million years ago.

