THE FAST APPROACHING ENERGY CRISIS

(This is an update of a September 2004 paper – The Approaching Energy Crisis)

Derek J Wilson, June 2005

The life contest is primarily a competition for available energy. Ludwig Boltzman 1886.

There is no substitute for energy. The whole edifice of modern society is built upon it…It is not 'just another commodity' but the precondition of all commodities, a basic factor equal to air, water and earth. E F Schumacher 1973.

On the 24 August 2004, the following exchange took place in the New Zealand House of Parliament between Green Party Co-Leader Jeanette Fitzsimons and the New Zealand deputy Prime Minister Dr Michael Cullen:

JF *What does the Minister understand by the term 'peak oil' and when does he expect it to occur?*

MC *I have to confess that, for once, the member has floored me; I do not understand what is meant by the term 'peak oil'.*

JF *Does the Minister agree, then, that the price of any commodity is likely to rise over time, when demand is increasing exponentially while supplies are being restricted by physical limits, and does he agree that oil is a commodity that has just such characteristics?*

MC *In theoretical terms, yes; in practical terms, no. We have yet to reach the point where it is all clear that new discoveries in oil – and I now think I understand what the member was getting at before – fall below the level of the projected demand for oil. At the present time, the production of oil is actually outrunning demand, and stockpiling is occurring. Prices are high because of, primarily, the uncertainty in the Middle East, plus the growing demand from China, plus the somewhat confused situation – to put it kindly – surrounding oil and gas companies in Russia.*

JF *Has the Minister been advised that the current oil demand is 81 million barrels a day and the total capacity of the world's oil fields to produce oil is 82.5 million barrels a day; and does he think that that provides sufficient headroom for demand to continue to increase – for example, with China's 40 percent increase in demand in the last year?*

MC *Clearly, therefore, the member has confirmed what I have just said: supply is actually exceeding demand at the present time. And, as prices rise, that will encourage new exploration and also new exploitation of known reserves that were previously uneconomic to exploit – for example – the extremely large Canadian oil shale reserves.*

JF *Has the Minister been advised that for some time now oil discoveries have been running at the rate of one barrel for every four that are burned, and how long does he think that that can continue; further, has he been advised that Canadian shale and tar sands oil will be extremely expensive compared with current supplies, as well as a lot dirtier?*

MC *Certainly on the last point, given the nature of the area there are several environmental issues, and exploration would certainly be more expensive. But it does seem to me rather odd that a Green Party member would bemoan a rise in price for a limited product.* [1]

Dr Cullen's admission that he did not understand what was meant by the term 'peak oil' was alarming. In a reply to the writer, Jeanette Fitzsimons reinforced her sound beliefs:

> *It will take a great change in the mindset of world leaders* [and I would add local leaders and the populace at large] *to move us out of the Oil Age and into the era of safe, sustainable energy. The Oil Age has inflicted incredible damage on the planet and its inhabitants through climate change, pollution and the way in which it has warped world politics, particularly in regard to the Middle East.* [2]

With regard to China, official customs data shows it to have imported 91 million tonnes of crude oil in 2003. (The year 2004 imports could exceed 100 million tonnes.) China imports more than 40 percent of its crude oil needs, a proportion that is rising as domestic production declines and consumption rapidly increases to fuel remarkable economic growth. China has marked out four sites at which to build 16 million cubic metres (100.6 million barrels) of strategic reserves – about 20 days consumption. With 10,000 new vehicles on the road every day China is ravenous for oil, and with its deserved reputation for thinking long term is buying up oil fields in Venezuela and the rights to the Athabasca oil tar sands in Atlanta, Canada.

It does not matter how many billions of tonnes of oil shale there might be in Canada - or anywhere else for that matter - if it takes the expenditure of one unit of energy to get two or more, is it going to be worth the effort, especially when the effects of carbon emissions and environmental destruction are considered? What will the price per barrel of oil have to be before it reaches an uneconomic extraction rate? In the light of what is known about 'peak oil', I find it almost impossible to understand the thrust of the Automobile Association-commissioned report released on the 25 September 2004. As the Green Party rightly says:

> *This report applies to a fantasy world in which petrol is less than a dollar a litre and where everyone owns a car and drives it everywhere. The reality is we're fast using up all the easily extractible oil reserves and fast approaching the peak oil supply, after which oil will be priced beyond the affordability of the ordinary motorist. As oil prices continue to climb, it will affect the cost of constructing new projects and it will also suppress demand. Planners should be preparing for a fundamental change in transport behaviour, rather than fuelling road-builders' fantasies… Peak oil is a reality and we should be planning now for the inevitable change in lifestyle, habitation and transport that it will bring. Building roads that will remain empty is not the answer.* [3]

New Zealand is a member of the International Energy Agency (IEA), which in its *World Energy Outlook* 2002 report saw enough oil to comfortably meet demand to 2030, a date which it seems the former Minister of Energy, Pete Hodgson, went along with, as does the present Minister, Trevor Mallard. As for 'peak oil', it is based on hard science. Global oil production is in the process of 'peaking'; soon it will level off, if it is not doing so already, and then decline. As Colin Campbell so eloquently put it in 2003: "Deal with reality, or reality will deal with you." [4] The IAE is now backing rapidly away from its earlier projections and recognising that it has a crisis on its own hands. Recently leaked IEA emergency oil conservation plans titled *Saving Oil in a Hurry: Measures for Rapid Demand Restraint in Transport* succinctly state: "Why should governments intervene to cut oil demand during a supply disruption or price surge? One obvious reason is to conserve fuel that might be in short supply." As the report puts it, while suggesting a whole raft of restrictions: "Our main conclusion finds that those policies that are more restrictive tend to be most effective in gaining larger reductions in fuel consumption. In particular, driving restrictions give the largest estimated reductions in fuel consumption." [5]

Initially, to greatly reduce our oil dependency it will be essential to drastically reduce the use of all the energy wasting paraphernalia of our profligate consumer society - the list is

very, very long. The question is of course: are the leaders of our society prepared to accept the evidence and take measures to ameliorate the inevitable effects of peak oil, or are they incapable of dealing with an issue of this magnitude such as our civilisation has never before experienced? What happens as *production* declines and the remaining oil becomes increasingly expensive? If the year 2000 turns out to have been that of 'peak oil', as Princeton Professor Kenneth Deffeyes told the May 2003 Paris Peak Oil Conference it was, adding that we are now on the plateau [6], worldwide *production* in 2020 will be the same as it was in 1980. But the world's population in 2020 is predicted to be approximately twice its present size and more industrialised than it was in 1980, producing a situation in which demand for oil will have greatly outstripped *production.*

It seems common sense, regardless of whether non-renewable energy sources will decrease more or less rapidly and finally run out in 20, 30, 40 or more years, to adopt the Precautionary Principle (prudent foresight) and do all that is humanly possible to mitigate the severity of civilisation's crash. Remember that on our evolutionary time scale, 2000 to 2050, say, is far less than the blink of an eyelid. Ali Bakhtiari, head of corporate planning at the Iranian State Oil Company, put it like this in 2003:

> *Depletion is not a problem of tomorrow, it is today. And right now there are no solutions. The run-up to depletion has already started. The two major signs are the volatility of natural gas prices and of course the instability of war in the Middle East. Currently 11 Middle East countries hold 42 percent of the world's reserves. America now has troops in Iraq and Saudi and Kuwait; the central command is in Qatar. It has the fleet in Bahrain, troops in Afghanistan, Uzbekistan, Georgia, Jordan, Djibouti, Kazakhstan and of course always in Turkey. Where don't they have troops?*
>
> *As global reserves decline, the Middle East becomes more important. But even God has his limits, and we have reached them.* [7]

Countries will be increasingly prepared to overlook death and destruction in order to maintain the oil flow. "Indeed, the US is explicit that the protection of pipeline routes (rather than the protection of people) is a prime reason why 'war on terror' is being waged." [8] There can be little doubt that Washington intends to turn Iraq into a strategic oil supplier. Iraqi pleas for the approximately 150,000 US troops to return home is unlikely to be received kindly. The Gulf War was the latest US battle in a long line of oil wars by the West, some of which are listed below from one source, with approximate deaths, to control Earth's energy-producing reserves.

• Iran 1953	
• Algeria 1954-1962	
• Suez 1956	1,000
• Nigeria 1956 to the present	
• Sudan 1959 to the present	2,000,000
• Guatemala 1960s-1996	200,000
• Colombia 1960s to the present	
• Democratic Republic of Congo 1965 to the present	2,500,000
• Angola 1975-2002	
• East Timor 1975-2002	100,000
(other sources give figures up to 250,000)	
• Ache, Indonesia 1976-2002	30,000
• Kuwait and Iraq 1991	100,000
• Chechnya 1994 to the present	40,000

- Congo 1997 10,000
- Afghanistan 2002 [9]

It is not, however, just the world's basic energy supply of oil which the US is determined to command, but the whole world itself. The emphasis is no longer on waging major theatre wars – its 'pre-emptive' war doctrine as detailed by the Neocons' 2000 *Project of the New American Century* (PNAC). This has been replaced by Defense Secretary Donald Rumsfeld's March 2005 *Agenda for Global Military Domination.* According to Greg Jaffe's report in *The Wall Street Journal* recently, this planning document outlines a vision for a massive remaking of the military into

> *a force capable of delivering on the ambitious security and foreign-policy goals that President Bush has put forth since the terrorist attacks of Sept 11, 2001…Mr Rumsfeld tells the military to focus on four 'core problems', none of them involving traditional military confrontations. The services are told to develop forces that can: build partnerships with failing states to defeat internal terrorist threats; defend the homeland, including offensive strikes against terrorist groups planning attacks; influence the choices of countries at a strategic crossroads, such as China and Russia; and prevent the acquisition of weapons of mass destruction by hostile states and terrorist groups.*[10]

According to Michel Chossudovsky: "This calls for a more 'pro-active' approach to warfare, beyond the weaker notion of 'pre-emptive' and defensive actions, where military actions are launched against a 'declared enemy' with a view to 'preserving the peace' and 'defending America'… From a broad military and foreign policy perspective, the March 2005 Pentagon document constitutes an imperial design, which supports US corporate interests worldwide." [11]

Before leaving this question of global power, the US Department of Defense in a 2004 report to Congress made clear some of its worries. "China's People's Liberation Army (PLA) is embarked on an ambitious, long-term military modernization effort to develop capabilities to fight and win short-duration, high-intensity conflicts along its periphery." [12]

However, the document which must be causing some headaches in official quarters in Washington is *Crisis on the China Rim* by an American research team and dated April 2005. It includes China's anticipated energy requirements.

- There is a crisis rising on the China Rim, a crisis made of economic imbalances, energy insecurities, ancient hatreds, and unsettled scores.
- The implications of China's exploding thirst for crude oil are epic in scope.
- The China Rim region is comprised of China plus 18 surrounding countries. Of these 19 countries, only four – Russia, Kazakhstan, Vietnam and Kyrgyzstan – generate a net production surplus of crude oil.
- The China Rim region's net crude oil production deficit is concentrated among five countries, four of which – Japan, South Korea, China and Taiwan – border on the East China Sea, an historical vortex of confrontation and violence.
- China, at the hub of the China Rim, is home to 20.4% of the world's population, but accounts for only 1.8% of the world's proven crude oil reserves. This huge disparity has already begun to heighten political tensions in the China Rim region.
- Sharp economic expansion has already created an annual crude oil production deficit of more than 0.7 billion barrels in China, despite the fact that China's annual per capita crude oil consumption is still only 1.6 barrels, 93.7% less than the US's 25.4 barrels.

- There is not just one new economic behemoth emerging in the China Rim region, there are two.
- The simultaneous economic rise of China and India will have a huge impact on worldwide crude oil markets. Specifically, an increase of only 'one barrel' in per capita crude oil consumption in China and India combined will most likely boost annual worldwide consumption by 2.4 billion barrels, or 8.6%. This incremental demand, we feel, is likely to provide considerable support for a sustained increase in crude oil prices.
- The large and expanding crude oil production deficit currently being generated by the China Rim region's five largest economies is already causing their hunt for crude oil supplies to 'spill over' into distant geographic areas such as North America, Central America and South America.
- The rapid and simultaneous rise of at least two behemoth economies, China and India, comes at a time when the world's crude oil production appears poised to peak.
- Given the tremendous costs and risks associated with importing crude oil into the China Rim region from the violent Middle East, we anticipate that pressures will continue to mount on the region's largest crude importers – Japan, South Korea, China, India and Taiwan – to secure reserves on the China Rim.
- From a global perspective, the world's total population of 6,379,157,361 implies that each **one barrel** increase in the world's annual per capita consumption of crude oil would require an additional 6.4 billion barrels of worldwide crude oil production. This hypothetical increment would represent a 23.4% increase in production from recent worldwide crude oil production of levels of approximately 27.4 billion barrels. If the world's average annual per capita consumption of crude oil were to increase by **two barrels,** the increment to demand would represent 46.8% of recent worldwide production.
- While China's economic rise is fostering a worldwide grab for crude oil reserves, it is also creating a 'war chest' with which China is financing the rapid modernization of the People's Liberation Army (PLA). The PLA, in turn, is the ultimate guarantor of China's energy security.
- Based on our analysis of the intense economic, crude oil, and military confrontations developing among the China Rim region's largest economies, we believe that the most aggressive crude oil price targets calling for $100 per barrel within the next three years will prove to be conservative.
- The sectors of the world economy poised to generate significant growth over the next three to five years are defense, oil service, 'energy security' and alternative energy. [13]

China's rapidly growing energy requirements stand in direct opposition to those of the US. Some idea of the latter's military energy requirements may be gauged from the following:

> *The US Department of Defense is the single largest consumer of oil in the world. In 25 minutes a single seater F-15 jet can burn 625 gallons* (2,840 litres) *of fuel, more than the average US motorist uses in a year. An aircraft carrier will use that much in under seven minutes. The military consumed about 200 million barrels of oil in 1989, enough energy to run the entire US urban mass transit system for 14 years.* [14]

Michael Renner of the Worldwatch Institute told us early in 2003: "US oil deposits are increasingly depleted, and many other non-OPEC fields are beginning to run dry. The bulk of future supplies will have to come from the Gulf region." [15] But there are immense problems here. The chief oil supplier to the US is Saudi Arabia, a dynasty as corrupt as they come. Craig Unger, in a recent explosive book, points out that: "More than any other

country, Saudi Arabia is responsible for the rise of Islamic fundamentalist terrorism that threatens America today." [16] Lutz Kleveman, New York correspondent for the German news magazine *Der Spiegel,* puts it this way:

> *War on Iraq is about a lot more than boosting oil companies profits. It's the latest battle in the ongoing war over who gets to control the earth's remaining energy reserves…there is a growing risk that radical Islamic groups may topple the Saudi dynasty and stop the flow of oil to Western 'infidels'.* [17]

The US spends an estimated $50 billion annually on its forces in Saudi Arabia in order to protect the oil wells – a military presence on what is holy soil to Muslims. Possibly no other act has done more to motivate al Qaeda to wage jihad against the West. Of course, the conflict over the control of oil in the Middle East has been going on for many years. A 1947 Foreign Office secret document described Middle East oil as "a vital prize for any power interested in world influence or domination". [18] In a 2002 documentary, Noam Chomsky attributed President Eisenhower with saying in 1958:

> *There is a campaign of hate against us in the Middle East based on our claimed support of brutal regimes, suppression of democracy, and exploitation of the region's oil. This is accurate and natural, because we want to maintain the status quo so that we can exploit the energy resources of the region.* [19]

What's changed? Quite apart from the continued exploitation of the countries with oil, Eisenhower's observations may be applied to the US administration's domination of many parts of the world over many years – a *Pax Americana* under which, as the American imperial planner George F Keenan put it, the United States had 'a moral right to intervene' anywhere in the world, and did so relentlessly, subverting and destroying governments which dared to demonstrate independence, from Italy to Iran, Chile to Indonesia. [20] All of which contravened Shakespeare's worthy advice of some four centuries ago: "Oh! It is excellent to have a giant's strength, but it is tyrannous to use it like a giant." For a brief appraisal of 'terrorism' refer to www.derekjwilson.co.nz under *Where on Earth are We Going? A guide to global issues.* 2004.

To examine Peak Oil let's go back a bit to 1956 when the late M King Hubbert, "probably the world's most famous and influential geologist", publicly announced the 'peak oil' theory which has it that 40 years after peak *discovery* comes peak *production*. It had already been established that US oil *discovery* had peaked around 1930. Hubbert noted that exploration in all its forms follows a bell-curve with *production* plotted against time. In the ascending curve exploration and production are easy and cheap, but in the descending curve it becomes progressively more difficult and expensive. [21] At the time, Hubbert and his ideas were much disparaged. However, with US oil *production* peaking in 1970-71, a few people began to realise that all was not well.

In 1972 the Club of Rome surprised the world with its study,*Limits to Growth*, which concluded that:

- If the population continued to grow and industrialise as it had been doing [and as it has continued to do], society would run out of renewable resources by the year 2070, resulting in a massive die-off.
- Even if the supply of resources was somehow doubled, a collapse would occur as a result of pollution. [22]

The report made clear that the Western economic model of development based on the pursuit of ever greater growth and material wealth, which placed profit before people, denied the most basic laws of Nature. About the same time, E F Schumacher asked whether the Earth's resources were "likely to be adequate for the further development of an industrial system that consumes so much and accomplishes so little." [23] Officialdom was not listening; had no intention of listening; may have been incapable of listening; while generally speaking people had little idea of what was happening. Over the past 30 odd years this development accelerated exponentially and with it the destruction of irreplaceable resources. At the same time, public warnings increased. It seemed officialdom was still not listening. There were some exceptions, President Jimmy Carter being one who declared in 1976:

> *We must face the prospect of changing our basic ways of living. This change will either be made on our own initiative in a planned way, of forced on us with chaos and suffering by the inexorable laws of nature.* [24]

Carter appeared on TV on the 18 April 1977 and told the American people that "ours is the most wasteful nation on Earth; we waste more energy than we import" and exhorted them to a massive national effort to conserve. Nevertheless, the Carter Doctrine, expounded by Carter in his State of the Union Address, January 1980, made it clear that any hostile effort to impede the flow of Persian Gulf oil would be regarded as an "assault on the vital interests of the United States" and would be "repelled by any means necessary, including military force." With the advent of the Reagan-Bush regime in 1980, Carter's ideas of energy conservation were nullified. Reagan ordered the Carter-installed hot-water panels on the White House roof removed and junked.

In 1995 Petroconsultants Pty., Ltd., one of the largest and most respected oil industry analysis and consulting firms, released a document called *World Oil Supply 1930-2025*. This report predicted that global oil *production* would peak around the year 2000 and decline by 25 percent by 2025. [25] Professor Kenneth Deffeyes has had this to say about Petroconsultants:

> *The loudest warnings about the predicted peak of world oil came from a firm in Geneva, Switzerland, called Petroconsultants, which until recently maintained a huge private database to which the rest of us had no access. I suspect that OPEC countries know that a global shortage may only be a few years away, and if they can trickle out just enough oil to keep the world economies functioning until that glorious day, then they can market their remaining crude at mind-boggling prices. Our grandchildren will ask someday: 'All those lovely organic molecules, and you just burned it?' Sorry, we burned it.* [26]

The situation overall is perhaps worse than those concentrating on the energy problem alone may be aware of for as Daniel Quin says:

> *If we continue ... to consume the world until there's no more to consume, then there's going to come a day, sure as hell, when our children or their children or their children's children are going to look back on us – you and me – and say to themselves, "My God, what kind of monsters were these people?"* [27]

Petroconsultants' report, which caused little notice to be taken of the deteriorating situation, was followed in 1998 by a sobering article by Colin Campbell and fellow geologist Jean

Laherrere. Campbell, former geologist for Texaco and Amoco, whose career took him exploring in 10 countries, was associated with Petroconsultants, and was former executive vice president of Total Final Elf, while Laherrere had worked for Total Final Elf for thirty-seven years exploring for oil in numerous countries.

> *From an economic perspective, when the world runs completely out of oil is ... not directly relevant; what matters is when production begins to taper off. Beyond that point, prices will rise unless demand declines commensurately. Using several different techniques to estimate the current reserves of conventional oil and the amount still left to be discovered, we conclude that the decline will begin before 2010.* [28]

Then in 1999, Dick Cheney, then CEO of the giant Texas oil company Halliburton, stated:

> *By some estimates, there will be an average of two percent annual growth in global oil demand over the years ahead, along with, conservatively, a three percent natural decline in production from existing reserves… That means by 2010 we will need on the order of an additional 50 million barrels a day.* [29]

This is equivalent to six times the amount of oil produced per day by Saudi Arabia, the world's leading oil producer. [30] In a late 2000 speech, Campbell summarised his current views:

- Conventional oil … provides almost all the oil produced today, and is responsible for about 95% of all the oil that has been produced to date.
- It will continue to dominate supply for a long time to come and is what matters most.
- Its discovery peaked in the 1960s. We now find one barrel for every four we consume.
- Production outside the Middle East peaked in 1997, and is in decline.
- The world peak will come within about five years.
- Nonconventional oil will delay the peak [of production for total hydrocarbon liquids] by only a year or two but will ameliorate the subsequent decline. [31]

A report commissioned by Cheney and released in April 2001 was no less sanguine.

> *The most significant difference between now and a decade ago is the extraordinarily rapid erosion of spare capacities at critical segments of energy chains. Today, shortfalls appear to be endemic. Among the most extraordinary of these losses of spare capacity is in the oil arena.* [32]

The year before this, the NZ Ministry of Commerce issued a report which stated:

> *In the last hundred years New Zealand's use of energy doubled every 22 years, while our CO2 emissions increased 22 percent from 1990 to 2000, and are projected to increase by 45 percent from 1990 to 2021 if growth in energy continues unchecked.* [33]

It seems obvious that locally and globally massive cut backs in energy consumption are essential. Ali Bakhtiari's remark about oil depletion not being a problem of tomorrow but of today, can be applied equally to climate change. It is here now. But the more people who understand 'oil depletion' the more one hopes the massive energy reduction essential for some sort of welfare can be achieved smoothly and without bloodshed.

With the new millennium, interest in the energy situation obviously sharpened. In February 2002, Colin Campbell reported:

> *Peak oil is a turning point for mankind. The economic prosperity of the 20th Century was driven by cheap, oil-based energy. Everyone had the equivalent of several unpaid and unfed slaves to do his work for him, but now these slaves are getting old and won't work much longer. We have an urgent need to learn how to live without them*. [34]

Campbell followed this up in 2003 with his book *The Essence of Oil & Gas Depletion:*

> *Oil and gas are finite fossil fuels from the geological past and are inevitably subject to depletion. Eventually we must run out, but what matters more is the inevitable peak of production when growth gives way to decline. The wider implications of this historic discontinuity are colossal.* [35]

In June 2003, Matthew Simmons, CEO of the world's largest energy investment bank, Simmons & Company International, George W Bush's energy advisor, and one who has highlighted the reality and significance of oil depletion, acknowledged that: "The situation is desperate. This is the world's biggest serious question." [36] Simmons went on, in an August interview, when asked if it was time for Peak Oil to become part of the public policy debate:

> *It is past time. As I have said, the experts and politicians have no* Plan B *to fall back on. If energy peaks, particularly while 5 of the world's 6.5 billion people have little or no use of modern energy, it will be a tremendous jolt to our economic well-being and to our health – greater than anyone could ever imagine.* [37]

Most politicians and economists are part of the problem, few are part of the solution. In a fundamentally flawed worldview, economists especially are trained to believe that natural resources come from 'markets' rather than Earth. As Kenneth Boulding, himself an economist, put it "anyone who believes exponential growth can go on forever is either an economist or a madman." [38] This would make an excellent daily pre-TV news flash. Growth, of which energy use is a vital part, together with the rapid and on-going depletion of Earth's resources, is a product of the Industrial Revolution. It has become an unassailable mantra – "the ideology of the cancer cell" [39] – and an absolute impossibility on a finite Earth. Just as a continuously growing cancer eventually destroys its life-support systems by destroying its host, this continuously expanding global economy is surely and mercilessly destroying its host – Earth's ecosystems. [40] According to Herman Daly, until recently senior economist with the environmental department of the World Bank:

> *The idea that we must either grow or die is just not supported by history and I think that the contrary is much more likely; if we continue to grow, then surely we will die.* [41]

But to return to the energy part of the equation, a month later in September 2003, in another interview, Simmons expounded further:

> *We are now in a box we should never have gotten into and it has very serious implications. We also see the inevitable issues that follow a major blackout: no water, no sewage, no gasoline.* [Simmons was referring to the August 2003 power grid shut

> down over a third of the US.] *The gasoline issue is very important. Our gasoline stocks are at near all time lows. With the blackout, more than seven hundred thousand barrels per day of refinery capacity were shut down. People were told to boil their water. (But)…they go to their electric stove which isn't working. What then?* [42]

Asked for a solution, Simmons advised:

> *The solution is to pray. Pray for mild weather… Pray for no hurricanes and (no reduction of) natural gas supplies. Under the best of circumstances, if all prayers are answered there will be no crisis for maybe two years. After that it's a certainty.* [43]

Prayers for mild weather are most unlikely to be answered. The Precautionary Principle has not been applied in the past to reduce our contributions to climate change. As a result, we can expect the weather to worsen. Simmons followed this up by saying:

> *I am an advisor to the Bush administration. Although I'm not sure they are listening. What I basically told them is that we had some looming energy problems: that we were barrelling into a really nasty energy crisis. We need a new energy. But I just don't know if there is one.* [44]

Also in September 2003, came a report that Chevron-Texaco planned to dispose of 550 filling stations in the United States; 900 in Asia and Africa; retailing and refining operations in Europe, South America, Australia and the Middle East and the exploration and production holdings in North America, the North Sea and Papua. Such planned actions should deliver a broad message about the pending peak and decline of world oil production. In May 2005, Exxon-Mobile, one of the world's largest publicly owned petroleum companies, quietly predicted an impending production plateau.

George W Bush's Secretary of Energy, Spencer Abraham, also echoed Simmons' sentiments:

> *America faces a major energy supply crisis over the next two decades. The failure to meet this challenge will threaten our nation's economic prosperity, compromise our national security, and will literally alter the way we lead our lives.* [46]

Alhough made prior to Simmons' and Abraham's comments, George W Bush's public announcement on 23 September 2002: "We need an energy bill that encourages consumption," is ludicrous. Bush was echoing President Nixon's 1973 comment on his country's global energy situation.

> *There are only seven percent of the people of the world living in the United States, and we use 30 percent of all the energy. That isn't bad; that is good. That means we are the richest, strongest people in the world, and that we have the highest standard of living in the world. That is why we need so much energy, and may it always be that way.* [47]

Was Nixon, in turn, harking back to earlier times? In 1948 George F Kennen, US Cold War planner, had rationalised American Imperial supremacy in a brutally frank State Department Policy Planning Study:

> *We have 50 percent of the world's wealth, but only 6.3 percent of its population. In this situation, our real job in the coming period is to devise a pattern of relationships which*

> *permit us to maintain this position of disparity. To do so, we have to dispense with all sentimentality ... we should cease thinking about human beings, the raising of living standards and democratisation.* [48]

The past five decade's history indicates that Kennen's advice was heeded. "Today the average US citizen uses five times as much energy as the world average. Even citizens of nations that export oil – such as Venezuela and Iran – use only a small fraction of the energy US citizens use per capita." [49]

It is extremely difficult to establish clear parameters for the true quantities of oil production and reserves, for there are many figures available. But one thing stands out – much false information has been broadcast. Colin Campbell puts it this way:

> *Telling the truth in the oil industry? Oh* (he laughs) *that was very hard. Most of the time, well no, you couldn't. Remember this is a game dominated by a small number of very, very greedy men. And I'm not revealing all the corruption. I don't have the time.* (He laughs again.) [50]

What then are we – the public – to believe when *CNN International* reported in October 2003 that a research team from Sweden's Uppsala University had discovered that worldwide oil reserves were as much as 80 percent less than previously thought? [51] When the Royal/Shell Group was reported to have slashed its 'proven' reserves 20 percent in early 2004? [52] When a month later energy company El Paso Corporation cut its proven natural gas reserves estimate by 41 percent? [53]

The energy industry has quietly acknowledged the seriousness of the situation. For example, Exxon-Mobile recently posted an article on its homepage, in which the company director Jon Thompson stated:

> *By 2015, we will need to find, develop and produce a volume of new oil and gas that is equal to eight out of every ten barrels being produced today. In addition, the cost associated with providing this additional oil and gas is expected to be considerably more than what the industry is now spending.*
>
> *Equally daunting is the fact that many of the most promising prospects are far from major markets – some in regions that lack even basic infrastructure. Others are in extreme climates, such as the Arctic, that present extraordinary technical challenges.* [54]

Early in 2000, former UK environmental minister, Michael Meacher, stated: "It is hard to envisage the effects of a radically reduced oil supply on a modern economy or society. The implications are mind-blowing." [55] Shortly afterwards *The Toronto Star* reported him as saying that we were facing "the sharpest and perhaps the most violent dislocation (of society) in recent history." [56] Peak oil has become the most powerful force for global destabilisation reaching as it does deep into our economic systems, our environment, our geopolitics and the whole of our societies.

With regard to food and water provisioning, which are irrevocably dependent on energy supplies, the future is not encouraging. World grain production has dropped every year since 1996-1997. [57] World wheat production has dropped every year since 1997-1998, while recent food prices in China could signal a coming world food crisis. [58] In the US in 2003 a quarter of the fertiliser factories shut down permanently. [59]

A measure of our failure to live within our hydrological means is that the world's population used three times as much water in 1995 as it did in 1950, [60] while the supply of

water per capita in 1994 was only one third of what it was in 1970. [61] These trends continue to worsen. (For more details of our water situation refer to www.derekjwilson.co.nz *Where On Earth Are We Going? A guide to global problems,* 2004 and to Anita Roddick's 2004 brilliant appraisal, *Troubled Water: Saints, Sinners, Truths and Lies about the Global Water Crisis.*)

The thought of oil depletion and its consequences hasn't yet entered the consciousness of the general public. Society, being addicted to oil, is unprepared for shocks of this kind. But as Aldous Huxley has warned us: "Facts do not cease to be facts simply because they are ignored."

- US oil *discovery* peaked around 1930.
- Global oil *discovery* peaked around 1962.
- US oil *production* peaked in 1970-71.
- Soviet Union oil *production* peaked in 1987.
- Global oil *production*, outside the Middle East, peaked in 1997.
- UK oil *production* peaked in 1999.
- Australian oil *production* peaked in 2000.
- Global oil *production* is predicted to peak around 2005-2007.
- US natural gas *production* peaked about 1970.
- Global natural gas *production* is predicted to peak shortly after oil. (By the year 2000, domestic *production* was at 1/3 of its peak level.) [62]
- Against a still increasing population, increasing industrialisation (especially in China) and thus increasing energy demand, we are currently burning four barrels of oil for every one discovered. [63]

We are a species in denial. Few seem to appreciate the gravity of the situation, where almost every current human endeavour – especially in our voracious consumer, growth-orientated, materialistic world – from transportation, manufacturing, electricity, pesticides, plastics, fertilisers, computers, paint – some 500,000 products in all – and particularly food and water production, is inextricably dependent on non-renewable oil, coal and natural gas supplies somewhere along the line. Any discussion about solutions must be based on scientific principles, not business and economics. Many suggested substitutes for oil have serious technical limitations. Coal, a long-term finite resource, is particularly harmful to our environment. Natural gas is also a finite resource. Hydro dams create their own raft of problems. Hydrogen is only an energy carrier and an energy loser, not a primary energy source. Nuclear power won't fuel transport, is horrendously expensive (remember the boast – "safe, clean and too cheap to meter"), its deadly wastes will be with us for millennia, while a September 11 type attack would make a nasty mess of a country's wellbeing. Biomass is one possibility, while wind and solar power have great potential. Proven or unproven laboratory technologies will not be ready for use within out required scale and timeframe.

THERE ARE NO COMBINATIONS OF ENERGY SOURCES WITHIN SIGHT THAT WILL SUPPORT A SMALL FRACTION OF THE LIFE STYLE THAT THE WESTERN AND WESTERNISED WORLDS HAVE GROWN ACCUSTOMED TO.

In an interview with *ABC News,* David Goodstein, Professor of Physics and Vice Provost of Cal Tech University, (his recent book is *Out of Gas: The End of Oil*), had this to say about Peak Oil:

> *Best case? The worldwide disruptions that follow the peak serve as a wake-up call. A methane-based economy is successful in bridging the gap temporarily while nuclear power plants are built and the infrastructure for other alternative fuels is put in place. The world watches anxiously as each new Hubbert's peak estimate for uranium and oil shale makes front-page news.*
>
> *Worst case? After the peak, all efforts to produce, distribute, and consume alternative fuels fast enough to fill the gap between falling supplies and rising demand fail. Runaway inflation and worldwide depression leave many billions of people with no alternative but to burn coal in vast quantities for warmth, cooking, and primitive industry. The change in the greenhouse effect that results eventually tips Earth's climate into a new state hostile to life. End of Story.* [64]

In spite of all this, every viable alternative form of energy supply, especially wind and solar power generation, should immediately be put on fast-track by all concerned, to "reduce oil dependence," as physicist Alfred Cavallo says, and not wait "for Mother Nature to slap them [the people] in the face." [65]

Above all other considerations, a responsible government-led programme for energy conservation is essential. The possibilities are legion.

Nevertheless, there *are* grounds for hope. None of the problems that beset us are insoluble. What's more, it's now a very small interconnected world in which few – that is in the developed world which is mostly causing the problems - can claim ignorance and most should be able to claim awareness. Unlike a possible collision with an asteroid our problems are of our own making and therefore we are the ones who control them. As Jared Diamond puts it – "we have the opportunity to learn from the mistakes of distant peoples and past peoples. That's an opportunity that no past society enjoyed to such a degree." [66] But what if we've already crossed the Rubicon? Shouldn't we be working towards a survivable collapse?

Perhaps the Saudi Arabians will be better able to cope than the Western world, for they have a saying: "My father rode a camel, I drive a car, my son flies a jet aircraft – his son will ride a camel.

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30 STEPS TO AN OIL-FREE WORLD (*The Ecologist* April 2003, with permission.)
People

1 Walk, cycle, take public transport or consider a car-pool whenever possible.
2 Reduce your travel by air.
3 If you need a car, buy the most fuel-efficient.
4 Service your car regularly – keeping the engine tuned and your car tyres at the maximum recommended pressure saves petrol.
5 Live as close to work as possible [or work from home].
6 Shop locally rather than in out-of-town superstores.
7 Buy regionally and seasonally produced organic food wherever possible.
8 Switch your investments away from fossil fuel to renewable energy companies, or exercise your right as a shareholder to pressure energy companies to make the transition to renewables.

9 Boycott the products of companies like Esso that are obstructing the transition to renewables.
10 Lobby your political representatives to press them to act, and vote accordingly.

Government
11 Accept a target of phasing out oil & gas use within 50 years.
12 Discontinue all direct and indirect subsidies to the oil and gas industry.
13 Refuse licenses for the exploration and development of new oil and gas reserves.
14 Provide investment, grants, and tax breaks for the development, use and purchase of clean renewable alternatives to oil and for energy alternative vehicles.
15 Increase investment in public transport.
16 Pedestrianise city centres and introduce congestion charges in cities.
17 Require car makers to ensure an escalating proportion of their vehicle fleet sales consists of petrol-free vehicles.
18 Increase minimum energy efficiency standards for vehicles.
19 Charge tariff policies on imports to support the local consumption of goods (particularly food) that have been produced locally.
20 Phase out subsidies to industrial food production, which is petrol-intensive, and support conversion to organic methods instead.

Business
21 Oil & gas companies should commit to converting themselves into renewable energy companies, and redirect their investments accordingly.
22 Car makers should commit to mass-manufacture cars now that run on hydrogen fuel cells or other renewable fuels, and that use lighter materials.
23 Companies should convert their truck and car fleets to the lowest petrol-consuming vehicles available.
24 Companies should provide incentives for employees to leave their cars at home and use public transport instead, reduce air travel, and promote telecommuting.
25 Companies should site their offices close to public transport.
26 Retailers should adopt a purchasing policy that provides preferences to goods from short supply routes and regional markets.
27 Companies should shift freight out of trucks and onto rail and waterways.
28 Farmers should convert from industrial to organic farming methods.
29 The plastics & packaging industries should replace their use of oil with corn, soybean, potato starch or limestone derivatives.
30 The clothing industry should use vegetable starch and natural fibres, such as wool and cotton, instead of oil-derivatives in their products.