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STRATEGIES, GUIDELINES, TACTICS AND PLOYS FOR MARKETING AND PROMOTING FOSSIL FUELS AND PETROCHEMICAL PRODUCTS

THERE ARE TWO serious threats facing the fossil carbon-based industries. One relates to energy and that threat is the development and expansion of non-fossil carbon-based energy supply systems. The other relates to agriculture. That threat is the development and expansion of soil fertility enhancing agriculture coupled with the expanded use of timber and natural fibres.

People in the oil and fossil carbon industries are very aware of these threats and they are totally aware that for their own survival they need to minimize such threats as much as is possible.

There are no mysterious conspiracies. There are just logical marketing tactics, just strategies of clever manipulative marketing, clever manipulative advertising, and clever manipulative public relations. And of course hand in hand with this, persistent, adept and manipulative lobbying.

A WARNING FROM PRESIDENT EISENHOWER

President Eisenhower, in his Farewell Address to the Nation in January 1961, lamented and warned Americans about the power of the Military/Industrial Complex. He was extremely concerned. So too must we be extremely concerned; but for us the "Complex" is a slightly different. Our concern has to be the power and undue influence of the Agrochemical/Fossil Fuel Complex. Both the farming community and city dwellers have to concern themselves with the power of that alliance. For on this planet, at this time, Global Warming poses a bigger threat to mankind than any current foreseeable military war. The stark reality is, the only significant causes of Global Warming derive from our use of the products of the Agrochemical/Fossil Fuel Complex.

Over time, within the Military/Industrial Complex a huge web of common interest was generated with such political power that the democratic process was and is often suborned in order to inappropriately divert government funds to the Complex. This is not wild-eyed conspiracy theory; it is but a matter of simple record in American politics, and to some extent, also Australian.

The large petrochemical industries are automatically part of this complex. In consequence the self-generation of an Agrochemical/Fossil Fuel Complex was inevitable. Their requirements would not be for governments to buy the products they make, but to have governments and government agencies legislate and regulate so as to make the sale of their products to others, such

as farmers, almost as inevitable as taxes. In this they have been frighteningly successful.

At least with the Military/Industrial Complex the hope is that their products are created to ensure their general non-use. To hopefully guarantee peace. This is not so with fossil fuels and agrochemicals. The ongoing promotion and the subsequent establishment of excessive use has made fossil fuels and agrochemicals more deadly and more threatening to a far greater number of people than war and the chemicals of war. Today we must recognize the new relevance of those warnings from President Eisenhower. We must recognize that a powerful web of interests have been woven to ensure that as much collected taxes and as much consumer money as possible is ferried to the fossil carbon conglomerates. We must also recognize that policies and opinions are constantly being groomed and shaped to convince us that there are no viable options. We must also understand that to the people involved it is no more than astute marketing.

We must now ask ourselves, are we really being influenced to such a degree? Are our opinions really being changed and modified so constantly without us being particularly aware of it? It's now time to urgently re-assess, for it is happening. Every year billions of dollars are spent on advertising by all sectors of industry and government. Why? Because advertising does work! A dollar doesn't go into advertising unless many more dollars come back. Most of us realize that unless we consciously stop and question our decisions and actions the subtle effects of advertising have real effects. Generally we don't mind too much. But the immense issue of Global Warming means the stakes are too high to continue to be complacent.

How well are the public relations organizations, the advertising agencies and the lobby groups employed by the fossil carbon companies doing their job of selling us fossil carbon fuels and products? Are they utilizing their clients' billions effectively? Are they instilling in us beliefs that the massive use of fossil carbon fuels and products is safe or if not totally safe, then certainly safe enough. Think about it for a few seconds. Could there really be any doubt?

Petroleum and petrochemical products are promoted and marketed with brilliance and talent. Attractive, clever advertising is used to create images implying responsibility and desirability. Well-oiled public relations machines ensure that educational institutions, governments and government agencies all look excessively favourably on the industries involved.

Of course within those industries any other approach would have to be considered as utterly incompetent, unrealistic or stupidly naïve. Tobacco companies market nicotine. Beer, wine and whisky brewers market alcohol. What else do we expect the oil and coal and petrochemical companies to do? Take note when you next see a rural newspaper, and you will find they are full of agrochemical advertisements and agrochemical "advice".

Good marketing means it is logical to sell to the world such premises that "chemically based agriculture is the way to go" and "organic agriculture can never ever feed a hungry world".

The same logic applies with wood. Wood is the only construction material not derived from oil or coal, and wood doesn't even require any significant quantity of fuel or petrochemical products to produce. Therefore the fossil carbon-based industries must instill in us psychological responses that suggest that the use of timber is somehow socially irresponsible and possibly even quite unacceptable.

It is a necessity for the fossil fuel industries to convince us that fossil fuel energy cannot be replaced in any immediate future and to have us believe that alternative energy systems are a pipe dream not really to be taken too seriously. They must also instill in as many people as possible a fear, disgust, or at least a vague dislike of any form of nuclear energy. Their job is to condition us to believe that nuclear energy is synonymous with nuclear bombs, that nuclear waste is a dangerous and impossible problem, and nuclear energy will never be a safe option for mankind in any immediate foreseeable future.

These are all logical ploys if your job is to convince the world to buy more oil and simultaneously to shun alternatives. The campaign to remove legislation requiring at least some electric cars be used in California is an example of how alternatives initiatives are crippled, and how a potential threat is astutely nipped in the bud.

It is apparent that a brilliant ploy, in the fossil carbon industries' strategies to further their marketing plans, has been the creation and manipulation of a whole range of environmental movements and environmental issues. It is ironic that so many environmental movements have been so successfully seconded to become insidious weapons to actually promote concepts and products that, in fact, destroy the environment. Environmental movements now too often contribute to the destabilization of climatic stability by consistently adhering to the dictates of the fossil carbon lobby. They don't seem to appreciate that climatic instability is biodiversity's single greatest threat.

It's all so very well done. Creating false images has become an art form. Environmental arguments are kept tightly focused to exclude any possible broad outlook but still make sense to too many unsuspecting yet sympathetic people. Today, so many single-issue environmental concerns conflict with each other that it becomes a confused lament to the responsible members of so many environmental organizations. Global Warming is lost in the mélange and oil sales boom.

Once upon a time, who would have suspected the motivations or the integrity of environmental movements? But things have changed. *Australasian Science* in its Volume 19, Number 1 Issue commented "Perhaps the most common strategy of corporate front groups is to portray themselves as environmentalists", along with the "corporate views they are promoting". Using, creating and fostering environmental groups have become very effective marketing tactics.

In the past, environmental issues have, almost by definition, been unarguable. Now the manipulations of emotions and beliefs have become the norm. Opinions have been manufactured. Stop anybody on the street. Ask them if they believe that wind turbines are noisy and ugly and responsible for killing large numbers of birds. Ask them if they think that solar energy uses up valuable land and is hopelessly intermittent and ridiculously expensive. Ask them if they believe that plutonium is the most dangerous, most poisonous substance known to man and is a totally manmade poison that never previously existed on the planet. Ask them if they believe nuclear reactors can turn into nuclear bombs and explode destroying millions. Ask them if a nuclear melt down will cause thousands to die. Ask if they believe the death toll from Chernobyl is not forty-eight but at least many thousands etc. etc.

Unfortunately and incorrectly, most people will say that all the above is true.

Millions of high-energy particles and supposedly deadly rays produced by naturally occurring radioactivity pass through our bodies every second of every day of our entire lives. Ask them if they know that. Ask them if they know that all life on Earth has evolved in, and adapted to, this constant level of natural background radiation over the billions of years since life first began. Ask them if they know that the human immune system is designed to comfortably handle radiation levels way in excess of the low background levels common anywhere on the planet.

You can be sure that the vast majority of people are totally unaware that undisputed evidence has already accumulated that shows that having considerably higher levels of background nuclear radiation than is prevalent, is healthier and increases longevity. The oil-created images of nuclear radiation hazards totally bury these facts. For more, see Chapter 10: **THE SABOTAGING OF NUCLEAR ENERGY.**

The manipulation of perceived images is very insidious. Test yourself. What do you tend to believe? Do you believe that man-made lakes and hydroelectric power stations are ecological disasters? Do you believe it is impossible to feed the world without fertilizers and agricultural chemicals? Did you think that drastically restricting the area of the world's farmlands and

creating wilderness parks made good ecological sense? And did you believe that rainforest trees should be left standing and never harvested, and not just the rare or ancient or exceptional ones, but all of them?

The list of questions can go on and on. And you'll find they all seem to have the same inevitable stock answers. Answers that are now all too readily accepted. Stock answers that are promoted by one or more professed "environmental" organizations. Stock answers that never get challenged. Answers that subtly just sneak in to become preconceived opinions. Stock answers that, as we will see throughout this chapter, actually ensure the sale of more natural gas, more oil, more coal, more plastics and an incredible quantity of agricultural chemicals. Stock answers that are just plain wrong.

The cliché answers and opinions didn't come about by accident. They are the result of broad-based and sustained public relations campaigns, and the media help it along. The media were, and still are, "encouraged" to write "the right copy". They are of course encouraged to do so by their own advertising departments. Advertising departments whose job it is to chase the advertising dollar. Executives who don't want to lose those big oil company accounts – ever. The general public has now been conditioned to accept, without question, too many "environmental" beliefs that ensure fossil carbon industries survive and prosper.

Are your own opinions on environmental issues based on genuine factual knowledge? Are they based on your own thoughtful information gathering and your own intelligent reasoning, or are they just part of the "common knowledge" we all now tend to accept.

It was only when I asked myself these very questions that I slowly realized much of what I presumed so glibly to be true, was simply not true. There were just too many lies. There were just too many distortions in matters of fact. I started to feel cheated and manipulated. I didn't like the feeling, and neither should you.

When we are fed a constant stream of slightly distorted facts, and a constant stream of slightly biased stories, we inevitably form opinions that we eventually begin to hold as accepted fact. But when you carefully re-read through all the articles, all the periodicals, all the newspapers, you see what they really say. You see how every single item of evidence, every concept that does not serve the acceptance of the required dogma, has been changed or defused. You see how evidence contrary to the oil selling cause is so consistently disputed, distorted, ridiculed or clouded in confusion. And when that doesn't work, note how unpleasant truths are channelled into information quagmires where in time they are conveniently forgotten. You also see how so many government decisions favour the fossil carbon industries. Decisions that all contribute inevitably to the unpredictably chaotic world climate that is beginning to swamp us all.

Yet, at the same time you see the instigators of this never-ending dirge of information manipulation, demand and gain credibility by deliberately and systematically posing as environmental benefactors.

I think the evidence is overwhelming and it says, "We are being manipulated". And the evidence also says, "The fossil carbon industries are the manipulators".

It may seem unlikely on first look, but as the facts are untangled and the biases are stripped away, the distinct and somewhat unpleasant picture clearly emerges. Without realizing it, so much of the green movement, so many environmental movements, and many of those protectors of esoteric biodiversity threats have been seconded to sell oil. They are unwittingly manipulated and manoeuvered to effectively support, and protect the coal, oil and petrochemical industries.

For example: The very noble sounding Washington DC based Global Climate Coalition (GCC) is a group reported by the American Association for the Advancement of Science to be supported by oil and coal producers and utilities. The World Wide Fund for Nature (WWF) is also typical of organizations with fossil fuel interests at heart. Green movements all over the world are either well supported or seem actually created

by the fossil carbon industries. They simply manipulated or seconded the environmental movements to their marketing aims. They effectively took them over. Unthinking members of environmental movements became their foot soldiers, their "green pawns" in their campaign to sell more oil, more coal, more natural gas and more petrochemical products. Green movements and fossil fuel interests are now so often, so happily in bed together.

Whenever you see or hear a statement from green movements or environmental movements always ask yourself the question, "Does their position on the particular issue directly or indirectly support the sale of fossil carbon fuels, derivatives or products?" Remembering while you ponder that destabilizing world climate is precipitating the greatest human and environmental disasters since the end of Neanderthal man.

At face value this all could sound somewhat unbelievable but there are many parallels with other global industry ploys. For example: the tobacco industries secretly funded many previously and ostensibly hostile businesses and universities to argue that no links could be made between smoking and ill health. Remember the stories constantly circulating. There was always the story of somebody's grandmother, reported to be very healthy and still smoking at ninety-five. How many lives did these subtle, pro-smoking campaigns cost?

Another example: Officials in the old USSR, after the collapse of that totalitarian regime, described how funds had been pumped into pacifist organizations and antinuclear groups in the West.. They were selling communism with the same tactical marketing systems employed by PR companies to sell tobacco. See Chapter 10: **THE SABOTAGING OF NUCLEAR ENERGY**, See also Strategy 32.

More recently in Australia, talkback radio personalities were criticized for allegedly accepting funding to bias supposedly unbiased editorial material about some major banks. Several irate phone-in listeners stated they were shocked and disgusted that such a practice was then apparently defended as "accepted procedure". It was about banks and banks are always fair game for criticism. Oil companies are smarter. They never let things get so far out of hand and are much more careful and professional in their manipulative practices.

When any large business is being subjected to public criticism, or is likely to be, it is understandable that it activates its public relations gurus to stall, defuse and distract adverse criticism, whether valid or not. Such advertising gurus have become expert in the dissemination of disinformation.

It's all standard practice and now, sadly, much of the environmental movement has become green pawns in the ongoing game of promoting fossil carbon materials.

It's time we all did some re-evaluation. It's time for second thoughts; it's time we questioned the very existence of many environmental issues. It is time we weighed the relative importance of dozens of minor red herring environmental issues against the destruction of our world's climate, and what such destabilization means. It's time to wake up to the fact that, even those of us not affected by weather inspired catastrophic events, are now paying the price. Skyrocketing insurance premiums are just one example. In many areas premiums, in real terms, have risen 400% since the 1960s. Many of us know from experience that insurance is often only partially affective. Most of have learnt that in real life, so much of what can be lost is just not insurable.

There is no need to believe that somewhere, at some time, a select group of evil men sat around in an oak panelled boardroom and planned the destruction of the world climate. But they might just as well have. For destruction of the world's climate is exactly what's happening.

No, it is more likely that the top executives in the big oil and petrochemical companies were simply justifying the continuation of their very enjoyable salaries. In consequence they single-mindedly and often fanatically promoted their companies' products to the absolute best of their ability. They may have even originally been

oblivious to the ultimate Earth heating results, or at least they claim to be.

It is the game plan of big business and it's also the game plan for small business. It's part of the system that has created a rich and vibrant standard of living in all those free countries where personal enterprise is rewarded. But every system requires some checks and balances, and for the fossil carbon and agrochemical industries' effects on world weather, there were none, and there still are none. And that can't continue.

Unfortunately there is an upper limit on the quantities of greenhouse gasses the atmosphere, and indeed the whole biosphere, can cater for. If Earth's human population was under a few million, we could quite comfortably operate an advanced civilization based entirely on fossil carbon products. With a world population exceeding even one billion, we can't. For marketing considerations the oil companies and the oil countries cannot afford to accept this premise. Their business is selling oil. Their lifeblood is oil.

Fossil carbon companies have been at the game for a long time, and they have not always been too subtle in their endeavours to promote their products as the following example illustrates.

Los Angeles wasn't always the way it is today. Prior to 1936 Los Angeles was smog free. In those days the City of Angels was serviced by the largest inter-urban surface electric train system in the whole United States. There were 1,100 miles (1,775 km) of rail lines linking the three counties in the Los Angeles area. (More correctly it should be described as Greater Los Angeles.) The whole system was owned and operated by private companies. The biggest company in the group was the Pacific Electric Railway Company. The popular name for the system was "Red Cars". In LA, if you wanted to go some place, you took a Red Car.

In 1936 General Motors formed a company called National City Lines. National City Lines was formed then it systematically acquired and dismantled the Los Angeles inter-urban electric rail transit system. The rail lines were to be replaced with diesel buses, manufactured of course by General Motors.

Firestone Tire, a major supplier or tyres to General Motors, and Standard Oil of California joined the General Motors marketing conspiracy. Once the rail lines had been physically removed, the diesel bus system that replaced it was itself then phased down. The smoky, smelly bus system was so decidedly unpopular that Los Angeles commuters bought automobiles by the thousands. Finally the last of the original patrons of the rail transit system, in desperation, also switched to automobiles.

Chrysler and Ford must have been impressed, for they joined in and began eliminating more of the state's electric rail systems. By the end of the Second World War the entire inter-urban rail transit system of Southern California was gone. Before General Motors started to disband the system there were also 3,000 electric trolley cars. They too went the same way.

They discovered or created a marketing bonanza. The same thing then happened in over forty cities across the United States. Electric trains were replaced with General Motors' buses. In total, over one hundred electric rail transit systems were dismantled. And in consequence, as planned, sales of automobiles, tyres and gasoline boomed.

This was a momentous change in direction for urban transport, and as we now appreciate, a disastrous one. It also illustrates the ways in which these industries gained their wealth and strength in the early twentieth century. More recently in Brisbane, Australia, a long-term plan to install light rail transit systems through the city was replaced with a bus-way system without any significant public debate. Does that sound like the Los Angeles strategy? But there is hope; Queensland is starting to rebuild its inter-urban rail system.

Just like the automobile and tyre companies, the fossil carbon companies have been a little too successful in their marketing and their lobbying. Their efforts to manipulate public opinion and community understanding has been so successful that they have created a nightmare for the entire

world, and now for themselves. They may have been oblivious to the consequences initially, but by now they must surely realize what they have created. They are at the helm of an enormously successful economic juggernaut that, having created the era of chemical agriculture and the era of fossil fuel derived energy, is now taking us down the road to an era of endless worldwide catastrophes.

People are getting sick of it. Half a century later, after Los Angelinos got totally disgusted with their petroleum generated smog and atmospheric pollution, the citizens actually voted to increase the taxes they pay. But the money had to be used to rebuild a rail system. So finally, sixty years after the dismantling program, the first trolley cars (trams) and the first underground or subway trains began to roll once again. The people got a chance to vote and they made a wise decision. The people themselves, not government and not corporations, got mass transit moving again in Los Angeles.

To save the planetary environment, to stop mad climatic changes, to save billions of people from never-ending "natural" disasters, it becomes absolutely necessary that we all recognize the factual distortions deliberately heaped upon us. We have to recognize the subtle tricks and techniques used by the marketing people to create their false images. We must recognize the almost subliminal messages that are now moving us to a fatalistic acceptance of our world being in a process of slow self-destruction.

When we recognize and understand what is actually going on, we will realize that Global Warming is not necessary, Global Warming is not inevitable, and in fact we, the people, can stop it happening. However we have to realize that governments, if un-prodded, won't stop it. Executives of fossil carbon companies won't stop it. It is up to us, the consumers and the voters; we are the ones that have to make things happen to halt Global Warming. No longer can fossil fuel corporations and fossil fuel countries count on us being the "silent majority". It is time to be heard.

First, we need to know the enemy and learn how he operates. This chapter spells out what must be the probably unwritten, but obviously well used tactics and guidelines that the fossil carbon companies and their associates employ. The guidelines their public relations and marketing people must live by. If in the following there are some concepts that are not being used it would have to imply marketing incompetence. And I don't think that marketing incompetence is among their faults. While all those involved would vehemently deny the very existence of the following marketing strategies, they are without doubt slavishly followed and rigorously adhered to.

Over time, marketing principles and guide lines have been developed for almost all possibilities. The strategies are subtle, well thought out, and are readily adapted if genuine environmental arguments arise, or when non-fossil fuel systems are proposed.

There are two simple rules that apply to all marketing operations, and in the case of the marketers of fossil carbon, those rules have been honed to a knife-edge.

First, concepts and actions that increase sales must be encouraged.

Second, concepts and actions that decrease sales, or could have the potential to decrease sales, must be "handled" or "spun". As part of this second rule it seems mandatory that genuine facts and straight honesty should never be allowed to cloud a fossil fuel or petrochemical marketing issue that might hinder the application of these rules and threaten sales!

In the rest of this chapter, some strategies and ploys covering the marketing of oil and coal, natural gas and petrochemical products are considered in detail. A summary list is included for easy reference. The reasoning behind their existence, the methods and techniques, and consequences of their use are discussed. Fossil carbon advocates will argue that a few of the following strategies are not yet used and never will be. That may well be, but if it is so argued then you alone must be the wise and observant judge. Of course the techniques and wording used by individual fossil carbon marketing organizations and the particular

emphasis they push will vary from time to time. However, the motivation behind these strategies and guidelines is to sell fossil carbon-based fuels and products, and that fundamental requirement will not vary from one fossil carbon company, or country, to another.

Many of these strategies you will be familiar with. Many you may not previously have considered as planned marketing strategies or ploys. This only highlights their effectiveness. But be assured, they are proven and successful promotional strategies and they are proven and successful marketing ploys.

One topic; the prevention of the development of nuclear energy, is extremely important in relation to the prevention of world climatic instability. Therefore a full chapter has been devoted to that subject. See Chapter 10: **THE SABOTAGING OF NUCLEAR ENERGY.**

In reading this book, you may only want to look at those strategies that are of particular interest, or that seem pertinent at the time and skip the others. Generally the strategies are fairly specific and so need not necessarily be read in sequence. Strategies can thus be perused at any time they seem relevant.

What will be of interest I'm sure, is whether the fossil carbon lobby and their green pawns in environmental movements dispute that these strategies even exist, or dispute that they are used, or used partially, or not at all. Some may even acknowledge that it is the way things work, and may ask, "Why not"? Then again in politics, a well-used tactic is to simply not answer questions nor dispute anything that might possibly generate unwanted attention.

But no matter what happens, we all must develop a deep and healthy skepticism and even cynicism for this current multiplicity of green causes and their oil-funded and their tax supported organizations.

And we must all realize that no environmental issue exists today that is even remotely as significant as the de-stabilization of this Earth's total climate.

STRATEGY 1

OIL COMPANIES AND COUNTRIES LOBBY TO INFLUENCE WORLD DECISIONS, INTERGOVERNMENTAL PANELS AND INTERNATIONAL TREATIES

In the arena of international politics, intergovernmental and international agreements are dreamed up and signed. Those decisions profoundly influence world fossil carbon industries and the people who use their products. It is one of the most important facets in the ongoing marketing and sales expansion of fossil fuels and fossil carbon related products.

In this arena, policies are made, guidelines are established, procedures are determined and priorities are set. Big oil, naturally, must not allow any of these decisions to conflict with their own interest.

The world's scientists may well agree on the world's ecological problems, but if those scientists determine guidelines and suggest international policies that are in conflict with various sectional interests, then those sectional interests will lobby hard to protect their interests. Although that is to be expected, we, the citizens of this world, must not allow them to succeed when their success threatens the stability of the total world environment.

The big oil companies are more wealthy, more powerful, and have more influence than many individual nations in this world of ours. The big oil companies are also the single biggest sectional interest group on the planet. We can be sure they do not plan to lose their wealth, nor their power, nor their influence. The countries that have the oil wells and the mines will also want to protect their interests. Mostly, all the manoeuverings are kept well out of the public gaze and we can only ever see the tip of the iceberg of this influence on decision-making worldwide.

In 1972 there was a conference in Stockholm, Sweden, the first world conference on the global environment ever held. It was titled "the United

Nations Conference on the Human Environment". The Secretary General was Maurice Strong. At the conference many views were expressed and many speeches were made. But only one really significant item resulted. That item was the formation of the UN Environmental Program.

The Stockholm conference was the stimulus for the United Nations General Assembly to establish, in 1983, the World Commission on Environment and Development. Its chairwoman was the then Prime Minister of Norway, Ms Gro Harlem Brundtland. It became known as the Brundtland Commission.

In 1987 Brundtland published a report entitled "Our Common Future". In her report she established the concept of "sustainable development". She called for a "marriage of economy and ecology", so that governments and their people could take responsibility, not just for environmental damage, but also for the policies that cause the damage. Some of these policies, she warned, threatened the survival of the human race.

The Brundtland Commission, realizing the seriousness of the threat posed by Global Warming to the world environment, called for an even grander conference that would involve all the nations of the world.

As a result, and at the urging of climatologists worldwide, the United Nations established the Intergovernmental Panel on Climate Change, the IPCC. It was also decided that IPCC meetings should be held on a regular basis. As a result the first meeting was held in Sundsvall, Sweden in 1990.

At the meeting, the meteorologists and all the other learned scientists present were overwhelmingly in agreement on two important issues. Their meetings established these two important facts. The first was that the rapid rise in carbon dioxide and other anthropogenic gasses was definitely causing massive world climatic changes. The second was that the politicians and their bureaucrats would not yet agree that major efforts should be made to prevent it.

At this first meeting Brazil objected that extreme overemphasis was placed on deforestation. The Japanese, who have no deposits of fossilized carbon, stated that they would only raise their emissions by negligible amounts. The Japanese also stated, justifiably, that they were already the most energy efficient of all the industrialized nations.

The Japanese then presented their own "action plan". A US pressure group, with a clever and very placating name, the Environmental Defense Fund, immediately claimed that the Japanese concern about greenhouse gasses was only motivated by their desire to sell their environmental technology, which mainly involved improving energy efficiencies. Why that would be such a disaster was not asked. Their implied insistence that from a moral stand point, the attainment of environmental objectives must never be financially successful, would more likely only ensure that the objectives were never attained.

Alden Meyer of the US Union Of Concerned Scientists was obviously disappointed at the IPCC report. He described it as just plain "wishy-washy". It was obvious to him that nothing decisive was allowed to happen. And nothing did. The conference became a pointless exercise for environmentally concerned people and a total victory for the astute marketers of fossil carbon products.

The IPCC organized another World Global Warming Conference in February 1991. One hundred and one nations sent delegates to that conference. The venue was Chantilly, Virginia, near Washington DC. Many subsequently claimed the fourteen-day conference was a total waste of time. It was felt by many that this was due to well-orchestrated delays. An influential United States based environmental organization, the Sierra Club, had a representative at the conference. The representative, Dan Baker summarized the general frustration when he claimed, "We've just wasted two weeks arguing over the shape of the table." Unfortunately too many in the Sierra Club with influence, would have preferred arguing whether the table should have been made from plastics and not rainforest timber.

The powerful US Government delegation

moved at a snail's pace. They insisted on getting approval for even the most minor change in the US position. The US delegation initially would not even concede that carbon dioxide was even a greenhouse gas. In long telephone calls, John Sununu, Chief of Staff at the White House, had to be convinced before the US could allow even that fact into the discussion. The only things of remote significance that happened at the conference were that two more committees were formed and that negotiations to limit greenhouse emissions should start.

The first committee would "consider" and "propose" methods of limiting greenhouse gas emissions.

The second committee would advise developing nations that they should not cut down their forests and should not use the wood. It would advise them to switch to (oil-based) Western technology. And, magnanimously, this committee would also teach backward nations how to "preserve and conserve" the tiny per capita energy they used for their very survival. It was hypocritical.

The petrochemical industry must have immense lobbying power in world politics. These are typical examples of its extent.

Following the meetings in Sundsvale, Sweden in 1990 and Chantilly, Virginia in 1991 came the world conference in Rio de Janeiro in June of 1992. It was given the high sounding title of The Earth Summit. The Secretary General of The United Nations Conference on Environment and Development was the same Maurice Strong who had been the Secretary General of the original Conference On The Human Environment in Stockholm exactly twenty years earlier.

It was a very big affair indeed and was attended by over 100 heads of government. They came from all the major world powers and they came from tiny Pacific island states.

So what happened down there in Rio?

It can only be described as another "snow job" on Global Warming. Although this time it might better be described as a blinding blizzard.

One of the major objectives of the Earth Summit set by IPCC was to have all participating countries sign a charter recognizing the all encompassing threat of Global Warming to the planet, and then agree on procedures to minimize it.

But it didn't happen that way.

It seems that well before the conference, steps were taken, and procedures were established, to ensure the total failure of the conference. Several of the more thoughtful and concerned environmental groups were realizing, even before it started, that the conference could well be – to quote one – "a failure of historic proportions".

The United States was already being blamed for what amounted to a guarantee of automatic failure. It was claimed that the White House had laid out a series of recommendations dubbed the "ten commandments" as guidelines for its negotiators attending the 1992 Rio conference.

The guidelines included a stance that all military matters be avoided, that America accept no liability for the environmental problems of backward countries, that all aid requests should be avoided, that over consumption by developed nations must not be discussed and that even mechanisms for settling disputes could not be created.

Policies to frustrate the implementation of greenhouse prevention measures became well known prior to the meetings. Some of the US obstructionist tactics were reported in *New Scientist* in their April 1992 issue, and that was two months before the conference even got started.

As the conference time approached more public relations manipulations became apparent. Underdeveloped nations that now contain much of the world's remaining cheap raw materials and natural resources were complaining bitterly that the Western press and Western governments were dominating and manipulating conference agenda. Need we ask whose interests were being served by these manipulations?

The founder of the Indian Center for Science and the Environment and a former advisor to President Rajid Gandhi spelled it out clearly. He said, "every element of the global environment

agenda is being chosen by the Western World. It is pushing a new ecological order down the throats of a hapless Third World".

It is often stated that 80% of the world's resources are consumed, and 80% of the world's pollution is produced, by the 20% of the world's population living in rich countries. To avoid these simple and relevant facts all the emphasis in pre-discussions and agenda structuring at the Rio de Janeiro conference was centred on sustainable development for Third World countries. The environmental mistakes of the Third World were to receive, and did receive top billing.

By contrast, the only mistakes the Third World countries themselves claim they were guilty of was in simply supplying the needs, and the demands, of the Western economies. If the West ordered tropical timber they argued, then they supplied it. And that is after all, what one might expect.

The Third World Network, whose headquarters are in Malaysia, represented some Third World countries. Their director at the conference was Martin Khz Kok Peng and he warned the Western World of the suspicions and fears Third World countries had, that "environmental protection will become another Western instrument to dictate to them".

In fact, at the time, it had already been happening. Two years earlier in August 1990 a forty-day long march of 6,000 forest dwelling Bolivian Indians had marched 400 miles to their capital, La Paz to protest a "debt swap" organized by American conservationists. Conservationists, who the Bolivian Indians insisted, sat at home back in their US of A while supposedly "protecting the Amazon's rainforest".

The concept of "debt swap" is best explained by considering a hypothetical situation. If the banks in a country, or the government of a country such as Bolivia or Paraguay or Ecuador, owe a few hundred million dollars to the United States Government, or to US banks, a debt swap might be proposed. Green movements and wilderness societies in the US guarantee funds to the US banks if they write off the debt in the targeted country. In exchange for this, the government of the target country agrees to partition off enormous areas of their country and legislates to prevent any form of development in the nominated areas.

Generally speaking, to write off the debts the wilderness societies prefer to lobby the US Government direct, while in turn they nominate and influence the areas restricted. Wilderness societies must get quite intoxicated by controlling and experiencing such power.

In most cases, debt swaps ideally dovetail the long-term strategies of the oil and natural gas industries. Large chunks of a country are prevented from ever becoming cheap agricultural land, and the vast timber resources of the target countries are prevented from competing with plastics, or any of the broad range of energy based structural materials.

Debt swap becomes a system where inane and bigoted decisions are forced on underdeveloped countries to the detriment of their future development and to the hindrance of their quest for a reasonable standard of living. In essence, in these Third World countries their "wealth of nations" is being cruelly manipulated by self-righteous, patronizing, self-proclaimed do-gooders.

The La Paz debt swap took 120 million hectares of their land, that's over a quarter of a billion acres, and locked it up as an inaccessible "scientific research and nature reserve". This was despite the obvious reality that these people had lived on that land for possibly a thousand years. The natives couldn't even utilize their own timber. The timber harvesting that was permitted was allocated to a group of foreign logging companies.

It had become obvious, even before the 1992 Earth Summit had started, that climatic destabilization from fossil fuel use was being orchestrated into a minor item on the agenda.

Up until just prior to the Earth Summit in Rio de Janeiro, the US government had always argued that a simple reduction in their use of chlorofluorocarbons, or CFCs, would be a sufficient contribution from the US to the cause of reducing Global Warming. The US argued that

this proposed CFC reduction should mean that no limit on its carbon dioxide emissions would be required. We could ask: is it just a coincidence that at that time there were thirty-four US senators in office – that's one third of all United States Senators – who represented states that were major producers of oil and coal? For them to be re-elected, they reason that Global Warming has to stay a non-issue. Likewise in Australia where every state has large fossil carbon deposits, mainly coal and natural gas, so the political reality is that continued Global Warming is also almost an Australian imperative. Of course the Middle East states have the same imperative.

The European Commission had been deciding their own carbon dioxide emission policies prior to the Earth Summit, and obviously the European Commission was already being "handled" by the oil-coal power brokers. The EC had initially pledged to bring CO_2 emissions back to 1990 levels by the year 2000. Unfortunately the proposed methods to do so were being vigorously blocked by interested parties. It was claimed by some Europeans that the methods "threatened industrial growth". Then strangely in a total about-face the EC eventually admitted that their CO_2 emissions would actually increase 14% by the year 2000 and not decrease at all. As time showed, there most certainly was no decrease.

As the new millennium got under way the EU decided to opt for an 8% reduction in greenhouse gas emissions by 2008. But of course there is no way this will occur while European cars run on petroleum fuels and electricity comes from fossil carbon sources. It's simply another delaying tactic.

To reduce the emissions of carbon dioxide into the atmosphere, it is often proposed that a tax, or some other form of levy, be imposed on the producers or suppliers of fossil carbon fuels and products. This discussed levy has become known as a "carbon tax".

Even before the Rio conference the EC commission had decided to impose a type of distorted "carbon tax" but to collect it by an additional electricity charge, not a charge on coal or oil or fossil carbon based fuels. This insane energy tax would therefore also be levied on wind, wave or any other alternative energy generated electricity. Britain had previously agreed to the format prior to the conference but then announced that it was "having problems with the text".

Even moves on energy efficiency were slashed from the EC agenda.

The European Community, with much fanfare decided that its policy should only be to "aim for improvements" at the then coming Rio conference. In consequence they set no goals for their submission to the conference. Even reporting requirements were not considered necessary. No time limits were decided. No standards were set. Finally, and still before the Earth Summit, the EC ministers weren't absolutely sure whether they would even send that final, very watered down submission to the Earth Summit conference at all.

At the same time on the other side of the Atlantic, it was suggested that to prepare the conference for the worst, it was leaked that President George Bush (the elder) wouldn't even make a token visit. Also a coalition of US industrialists were reported to be preparing suitable documentation to counter the growing awareness of carbon dioxide emissions and other gasses' contribution to Global Warming. One action that resulted was headed by Don Pearlman, a former adviser to President Reagan, who wrote to IPCC rebuffing the threat of greenhouse gas emissions. The letter was under the banner of the "Climate Council", a Washington lobby organization. Don Pearlman just happened to be also working for the US National Coal Association at the time.

The Earth Summit in Rio de Janeiro finally got under way.

Prime Minster John Major of the United Kingdom scheduled himself to arrive towards the end of the conference. To set the scene Major had already given advance warning that the UK had no money for any environmental aid.

At the summit, Germany suggested a more definitive declaration on carbon dioxide emission limitations. Britain and the US vigorously opposed this concept. Ultimately Britain did

agree to a watered down version. Today one must wonder if the German position was as noble as would be presumed, for in 2003 Germany renewed legislation to continue the subsidization of their coal-fired power stations and had, almost simultaneously, closed down all but one of their nuclear power stations.

Although the Pacific Island States were bitter, the Climate Change Convention agreement, hopelessly watered down by the US and others, was eventually signed. It effectively confirmed that nothing was mandatory on participating nations to reduce carbon dioxide emissions at all.

Coincidentally on that very same day of signing, a different and totally unrelated group of US government scientists finalized a politically unrelated report. It was produced by the United States National Oceanic and Atmospheric Administration. This report related to the Marshall Islands, a group of islands halfway between Australia and Hawaii, concluded that rising seawater levels and resulting flooding would cause devastation to the Pacific island group. So in Rio, the US was categorically and emphatically denying their own meticulous, well-funded research. It was "double-think" at its worst.

The foreign minister for the Islands, Tom Kijiner, speaking back in Rio, said that the rising seawaters from Global Warming, could destroy the Marshall Islands "as effectively as a nuclear bomb".

The Vanuatu UN Ambassador Robert van Lieerp expected similar devastation on his South Pacific island chain. He also reported that many islands in the Maldives, a group in the Indian Ocean, had already been evacuated and abandoned because of sea level changes.

Ten billion dollars in pledges for assistance had been assembled, before and at the convention. It was felt by the Western Nations that such pledges would surely signify the success of the Rio de Janeiro conference and then things could again continue undaunted. It was probably reasoned correctly that the Western donor nations and their lobby groups would control the money.

Much of the money had, in fact, already been earmarked for squandering on the much touted "Threat to Biodiversity" and in consequence more tropical timbers wouldn't be harvested, and an ever-booming market for oil-derived plastics would be assured.

About a hundred nations had their bureaucrats and their officials there to sign the Earth Summit Declarations, and it all meant nothing. However that conference was useful in one important respect. It was indeed educational. The Earth Summit in Rio de Janeiro in June of 1992 clearly demonstrated the lobbying ability, the immense power and the marketing and public relations skills of the world's fossil fuel producers. It showed clearly, how and how much they could influence governmental and inter-governmental decisions. And to all thinking people, this has to be frightening.

Then there was to be another IPCC conference. Would the same thing happen?

Berlin April 1995: Another conference on Global Warming was convened. Leaders from 120 countries and their 2,000 delegates attended to either lament the destabilization of world weather, or to protect and pursue their markets for oil or coal.

The first World conference in Rio de Janeiro in 1992 had proved an almost futile exercise benefiting and protecting only the oil and coal producers. Was the Berlin conference handled and manipulated the same way?

It certainly seemed so.

This time finally even the energy power brokers almost conceded that Global Warming was really happening. Their attack then switched from denying its very existence, to blaming everything except the fossil carbon industries for its creation. They blamed sunspots. They blamed land clearing and deforestation. They blamed pig and cattle flatulence; and anything else they could think of.

In addition they switched to another, totally new line of attack. This was structured on endeavouring to establish the concept that it was more economical for the world to let it just happen.

Paul Ekins, an economist of Birkbeck College, London, who attended the conference, was hugely critical of this public relations ploy. He was vociferous in his attacks on the Intergovernmental Panel on Climate Change's emphasis on the cost of Global Warming compared with the cost of preventing it. The "preventing systems" he said, are never defined and in consequence the hypothetical costs are a dreamed up fiction. He described these "red herring" arguments as "the economics of the mad house" and added, "I did not become an economist to produce figures of this kind".

The IPCC preliminary report, being drafted at the time, stated that the damage cost of a massive doubling of atmospheric carbon dioxide levels would only reduce world Gross Domestic Product (GDP) by between one and three per cent, and even this would take until the middle of the next century to happen. Ekins pointed out that these results appear to "suggest that very little abatement of carbon emissions is justified, because the costs exceed the benefits". A conclusion that would be extremely acceptable to the powerful oil lobby, and obviously one it would plug for.

A very dubious, and one might suspect highly biased US study put the cost of preventing Global Warming at an incredible US$3.6 trillion suggesting it was more economical to ignore it. The study blithely presumed that the necessary relocating of people resulting from the loss of their land from permanent flooding or permanent drought would only cost a mere $1,000 per head. Apparently the almost unbelievable objective is to prove that ignoring Global Warming is somehow "cost effective".

We should ponder, "How was this $1,000 determined?" Is it the cost to build railroads out of Global Warming devastated land, plus the cost of cattle trucks to transport the people to some new Utopia? One would suspect it would not be much of a Utopia as there would be no roads in their Utopia, no fences, no infrastructure and probably not much left from the $1,000 to build them. That particular study did magnanimously indicate that the US$3.6 trillion would be spread over 110 years. Of course by then most of the refugees would have died from (if nothing else) old age..

Paul Ekins has done some quick sums on that US study. He was able to point out that even this fanciful sum, spread over that 110 years would only reduce the average 3% annual growth in the Gross Domestic Product of the United States by a minuscule 0.074%. He commented, "They wouldn't even know they had made the sacrifice". And that is only if the $3.6 trillion was actually true.

Carbon dioxide levels, Ekins calculated, could easily be cut by 20% in Western industrialized countries. They could be cut with little effort and quite comfortably in ten years and "at practically no cost". These figures are more in line with what is generally considered as current unbiased reasoning. The 20% could be accomplished quite easily by simply minimizing energy waste.

A lot of figures emerged before, during, and after the Berlin conference. A lot of attitudes hardened. Some of the industrialized countries, notably the US, were most reluctant to commit themselves to any reductions in their greenhouse gas emissions at all. They still doggedly argue that scientists have yet to come up with conclusive answers as to the reality or not of Global Warming.

Kuwait and Saudi Arabia strenuously opposed even the thought of a reduction in the world use of oil. The powerful US oil lobbies were determined that the US should do the same.

The IPCC expects doubling of world carbon dioxide levels to increase average global temperature between 1.5ºC and 4.5ºC (probably during your children's lifetime). Wild climatic fluctuations ranging from new ice formations with freezing weather, through flooding to the formation of new and scorching deserts, are now predicted by most meteorological climate modelling. And the new climate patterns can never really stabilize as long as CO_2 continues to be added to the biosphere.

We can ask: "What finally was allowed to emerge from the Intergovernmental Panel on Climate Change Conference in Berlin in April 1995?"

The countries all agreed to the "Berlin Mandate". This is a document "of principle". It contained less than 1,000 words – that would be about three pages. That's just half a word for every delegate attending the conference. The main principle that all agreed to was that another meeting be called. At this next meeting it was hoped that some international legal commitment by the attending nations could be formulated.

At least something happened. The Berlin Mandate meant that most of the governments of the world's nations, now finally accepted the words of their scientific advisors. They now actually agreed that something should be done. It seems that buried in the typically verbose wording of the other many documents produced, genuine commitments were not only agreed to but also actually made. Of course all this may have been just a ploy by the string pullers to give people time to "accept" that Global Warming was inevitable, and therefore should be accepted.

John Gummer, Britain's Minister for the Environment at the time, said enthusiastically "It means we have a real chance, (but only a chance) of avoiding the worst of climate change". Venezuela and Nigeria are major oil producers, but they, nevertheless argued for curbs on CO_2 emissions, a policy more in line with other developing nations and not the oil producers. This apparently forestalled an expected combined veto from Saudi Arabia and Kuwait designed to protect their oil sales.

Australia, the world's greatest exporter of coal, which is the world's worst fossil fuel atmospheric polluter, sided with Canada, another large fossil fuel producer, and with the US to play a very low profile role. Apparently the Clinton Administration needed to play this low profile role to appease the Republican-dominated Congress. Republicans are notoriously friendly to their oil lobby. And with its massive income of export dollars, both sides of Australian politics are notoriously friendly to their coal lobby .

Al Gore, the Clinton Administration's proclaimed green Vice President did not attend, thus ensuring little US media coverage.

Kamal Nath, the environmental minister of India, pointed out that the carbon dioxide discharged into the air from the Western industrialized nations, in the time between the Rio de Janeiro conference and the Berlin conference, would be more than enough to "suffice India's development needs (for discharging additional CO_2 into the atmosphere) for the next 50 years".

It put some perspective on emission levels.

It was agreed at the conference that undeveloped nations need not accept limits on their carbon dioxide emissions as their per capita CO_2 emissions were negligible compared to the developed countries. This would have pleased the oil producers as it meant open slather for establishing new markets.

There were some sources of atmospheric pollution that were almost conspicuous by their obviously contrived absence in discussion. This is one. The fastest expanding source of atmospheric carbon dioxide in the world comes from bulk international air transport. It was conveniently agreed at the meeting that the use of oil as the power source for bulk air transport would not be targeted.

Also totally missing from the Berlin conference was any mention of the expanding use of agricultural chemicals for the production of the world's food. We have seen that the use of these chemicals and the resulting destruction and breakdown of soil organic matter releases carbon dioxide into the air at a rate comparable with that of burning fossil fuels. Yet this never got a mention. That it didn't get a mention, one might presume, was not just some simply foolish oversight.

The Global Climate Coalition, one of the US organization funded by the fossil carbon industries, attended the conference, so naturally they kept hammering the "uncertainty of Global Warming predictions". Maurice Strong, an avowed proponent of hydroelectricity and sustainable development, had been Director General at the Rio de Janeiro conference; he in turn became chairman of Ontario Hydro. Strong, most assuredly would have had his finger on the pulse of world opinion. The Global Climate Coalition must have

gloated on hearing Maurice Strong's lament that since Rio "there is no question that there has been a recession of political will" on countering Global Warming and also his summary of the Berlin conference that: "For all the talk, evidence of major decisions promoting sustainability, is hard to find."

The periodical *Scientific American* in their June 1995 issue penned a very astute and succinct summary of the events. The article first mentioned the lofty principles propounded in Rio de Janeiro in 1992 and then went on to say, "Fast-forward to 1995. Just as St. Augustine prayed for chastity – 'but not yet' – parties at the climate convention meeting in Berlin in April expressed an earnest desire to do something about the release of greenhouse gasses, chiefly carbon dioxide – but not yet".

At the conference, the upper limit of global temperature warming of 5ºC by the year 2100 was reassessed, and lowered to 3.5ºC. This figure was included in the IPCC report. But as we shall see later the reassessment should have gone up, not down.

Ironically the slight reduction in forecast temperatures is now attributed to the cooling effect of aerosols i.e. fossil carbon pollutants. But these are surely "snake oil" cures, wherein the medicine is often more deadly than the disease.

Truth however did manifest itself to some extent towards the end of the Berlin conference. Global Warming and its horrendous consequences, they concluded, are happening right now. Unfortunately and sadly, the information and the warnings were difficult to find in subsequent media reports.

In October 1995, the IPCC released its Global Warming report in Washington DC. The report was 1,800 pages long. It took two full years to compile and assemble. It involved something like 500 scientists and hundreds of submitted scientific papers. There were 500 reviewers scrutinizing the papers and the reports. They came from 70 countries. Strangely, it was released too late to be used at the conference.

The report emphatically declared and confirmed that Global Warming was happening. It considered that Global Warming could be expected to affect just about everything we do, human health, world agriculture and food production, ocean fisheries, the spread of tropical diseases, and generally and unhappily for us, all for the worse. And this report was released just a little too late for the Berlin Conference. Search the Web for "IPCC Second Assessment Synthesis of Scientific-Technical Information relevant to interpreting Article 2 of the UN Framework Convention on Climate Change."

The report also declared that the effects, and the warming itself, could quite possibly be dramatically reduced at surprisingly low cost.

This enormously detailed report, this report of world significance, this report warning of a plague of human disasters unparalleled in recorded history, received minute world media coverage. Why was that? One has to again ask, "Who orchestrated that particular giant cover up?" Surely, one might think such a report was scary enough to be seen as "news".

Even as late as December 1995 when Global Warming reports in general were being submitted to an IPCC governmental meeting in Rome, there were loud objections. And the loudest, to quote *New Scientist*, came from, of all people, Saudi Arabia, Kuwait and Dow Chemicals.

One small item in the report discussed the expansion, resulting from Global Warming of areas defined as tropical or sub-tropical. With clinical detachment it pointed out that the inevitable concurrent spread of malaria transmitting mosquitoes would ultimately result in an additional 50 million to 80 million cases of malaria every year. Other unrelated studies show that new drug resistant malaria strains, carried by pesticide resistant mosquitoes, are spreading rapidly in tropical areas. This spread alone is already of grave and mounting concern to anybody who knows.

Various lobby groups still found the report threatening enough to warrant repudiation. For example: John Shales, the Executive Director of the coal and oil funded, Washington based,

Global Climate Coalition described suggestions and proposals in the report, designed to mitigate Global Warming, as "speculative technologies and wishful thinking".

In New York there is a structure called The Environmental Defence Fund (Don't they have such beautifully marketable titles?). Michael Oppenheimer from the fund suggested that only "at the high end of projected warming (do) all societies face substantial disarray." How nice. Are we to presume that "general" disarray is to be taken as quite acceptable? And if so, by whom? Certainly not by those facing the disarray. Incidentally, one group of those facing the disarray includes residents living all along the US Atlantic coast, both north and south of New York City.

Robert Watson was in the Clinton Administration's White House's Office of Science and Technology as the Associate Director for Environment. He also co-chaired the IPCC study group. Watson magnanimously concedes, "The message of this report, from these 500 scientists, is that we all must be concerned about climate." Again, how nice!

Then in December 1997 came Kyoto. Over 160 countries sent their representatives to an International Conference on Global Warming in Kyoto, Japan. The conference was held to hopefully ratify some form of international treaty on greenhouse gas emissions.

Prior to the conference, the US President's Committee of Advisers on Science and Technology had proposed that the US spend $1.1 billion on energy research to develop more efficient and renewable technologies. Britain's Prime Minister Tony Blair supported the view of his science advisor Sir Robert May that carbon-based emissions worldwide had to be reduced.

It sounded great, but then the lobbyists made their presence felt. Well before the conference date approached, US "environmental" officials had already described as "unrealistic and unachievable" a European commission proposal that emissions should be reduced by 15% of 1990 levels and this should occur by 2010.

Prior to the Kyoto conference a 600 page "special" report on Global Warming and carbon dioxide emissions was completed. IPCC released an executive summary of this report at a meeting they held in the Maldives in the Indian Ocean. It was based on an expected doubling of carbon dioxide levels by 2100. It predicted a 2.25ºC plus or minus 1.25ºC rise. The worldwide minimum sea level rise was predicted to be between six inches and three feet (150 mm to 950 mm).

The report suggested that entire forest types would disappear. It considered that two thirds of the American tundra would thaw, releasing additional huge quantities of carbon dioxide, and 60% of the world's population would become affected by malaria. There was little encouragement in this IPCC report.

Well, with everyone totally aware of the increasing disasters likely to result from Global Warming, what happened in Kyoto? It has to be said yet again the whole conference was an exercise in utter futility. The year 1990 itself was a dreadful year for carbon dioxide emissions. Yet 1990 had and has somehow become the "base" year. The level of a country's greenhouse gas emissions is based on whether they have increased, or decreased from those already huge 1990 emission rates. Even throughout the 1960s, the 1970s and the 1980s, greenhouse gas emissions were too high and constantly rising. Selecting 1920 or 1930 as a base year would have made real sense. But they didn't – they selected 1990.

There were 8,000 delegates at this United Nations Framework Convention on Climate Change in Kyoto. After it finally got started the delegates settled down into a never-ending argument as to what levels a country's greenhouse gas emissions would be reduced to by the year 2010.

One report summed it up beautifully. It said that by the end of the two week conference everybody was so bored and so fatigued that they ended up agreeing, (for want of something to agree on), that all countries should reduce their greenhouse gas emissions from their 1990 levels by "something". They even agreed that Australia, Iceland and Norway could increase their emissions by 8%,

10% and 1% respectively. This was considered as an achievement as these countries wanted to increase their emissions by even greater amounts. Not one country agreed to reduce their levels by more than 8%.

Then again, exceptions were allowed for "Countries in transition". They were conveniently absolved from any meaningful future responsible action. These were the East European countries undergoing a transition process to a market economy. These countries were allowed to actually increase their emissions from between 22% and 30%. This of course would undoubtedly firmly establish that a fossil fuel reliant industrial base would become well established. It was also agreed that "Developing Countries" didn't have to make any commitment about anything at all. It was also agreed that the signed protocol would not be a legally binding document until at least 55% of the parties to the convention had ratified it. Ratification approval invariably is dependent of back-home, domestic, political issues and systems. After they occurred there was still another 90 days before it could ever become enforceable.

The publication *Science*, the official journal of the American Association of the Advancement of Science, said in its January 1998 issue, commenting on the outcome of the Kyoto conference, "If no further steps (beyond what was agreed at Kyoto) are taken during the next 10 years, CO_2 will increase in the atmosphere during the first decade of the next century essentially as it has done during the past few decades".

And yet Kyoto was hailed by our puppet-like politicians, and by the vast majority of the media, as a great success story.

Quite a few delegates considered that it would probably be necessary to have another world conference before 2010. It seems that many of the delegates at the Kyoto conference were happy to put Global Warming on the back burner indefinitely. But they also seemed to agree that another world trip would be nice!

This conference in Kyoto of 160 countries and 8,000 delegates, discussing the massive deterioration in the stability of world weather and the resultant deaths and devastation and loss to our communal assets, was a failure before it started. It did not discuss the elimination of oil and coal and natural gas to power our cities and our transport systems and our lifestyles. It simply argued that some countries in the world should not contribute to this constantly emerging disaster at quite the same rate.

The Kyoto International Conference On Global Warming was a total win! win! win! for the oil and the coal and the natural gas lobbies.

Let us look at the realities of the Kyoto "achievements" and consider some determinations. Mike Hume, a Senior Research Associate in the Climate Research Unit, University of East Anglia, Norwich, and Martin Parry, the Director of the Jackson Environment Institute at University College, London put things in simple terms. They reported in the December 1997 issue of *New Scientist*, that if you run the scenarios through standard IPCC climate modelling (current at that time and it's gotten worse) it is obvious that if we do nothing the entire atmosphere of planet Earth will warm by 1.6ºC by 2050; and it will happen along with all the associated weather and climatic changes. It is now generally conceded that compliance to all the Kyoto protocols by everybody will delay the 2050 date by just six months.

There were several proposals suggested by various countries. There was a call from the small island states, especially the Pacific island states, for a 20% reduction of CO_2 levels by 2005. That was actually considered laughable by most delegates. The United States suggested that world global emissions be "stabilized" by the year 2012. That is increasing levels but not reducing them. The European Union suggested a 15% reduction in greenhouse gasses by 2010. The United Kingdom suggested a 20% reduction by the same date.

It was all pointless. Application of the most possible of these suggestions indicate that Global Warming would be at best slightly altered from a rise of 1.6ºC by 2050 to a rise of 1.5ºC by 2050.

Brazil proposed a 30% reduction in greenhouse gas emissions by the year 2020. That proposal

would have the effect of reducing Global Warming to 1.4ºC by 2050.

Among the vast majority of world's meteorologists and climatologists, you will find little argument against Hume and Parry's figures. Their figures are typical and undoubtedly conservative (as time has shown).

It is obvious that Kyoto was orchestrated to become a verbose argument over insignificant percentages. Kyoto was never allowed to even consider the elimination of fossil fuels nor how this elimination might be achieved.

Time has also shown the fossil fuel lobby was totally successful at Kyoto.

Then there was another IPCC conference three years later, this time in The Hague, in November 2000. In the time between Kyoto and The Hague, the US legislature had totally rejected the Kyoto mandates. This was mainly because of the ridiculous Kyoto concept that developing countries could do whatever they liked about Global Warming and could, in fact add carbon dioxide to the atmosphere with absolutely no restriction whatever.

At The Hague, the discussions soon degenerated into arguments such as whether fossil fuel consuming countries could grow trees in undeveloped countries and thereby meet their Kyoto "obligations". The Kyoto obligations remember, have only ever amounted to a minuscule few percentage points reduction on the frightening 1990 carbon dioxide emissions. The obligations, it's been argued, could be met by financial trading in the conveniently invented market of "carbon credits".

Other issues were argued and debated until everybody got disgusted and went home. The whole thing was a joke, and cost us taxpayers millions. The only agreement reached by the delegates was that they would all get together and have another debate in six months. At The Hague the fossil fuel countries and the fossil fuel companies had another brilliant win; just like at Kyoto.

At least the delegates at The Hague did finally agree that world temperature rises are caused by the burning of fossil fuels. This was actually very significant as it finally ended any argument that Global Warming was a myth and it also ended any argument that it could be blamed on unknown or undiscovered phenomena. Also at the conference the forecast maximum world temperature rise by 2100 was increased from 3.5ºC to a possibly utterly catastrophic 6ºC. As previously mentioned, that temperature rise is more than enough to induce an irreversible Greenland meltdown and guarantee world sea level rises of at least twenty feet (six metres).

And another meeting was scheduled by the Intergovernmental Panel on Climate Change, for Amsterdam in July 2001. This time 1,800 climate scientists from 100 countries met, yet again to discuss Global Warming. The conclusion was that it is definitely happening, and this time it was agreed that the consequences would be a lot worse for the world and its people than ever previously imagined. Again the scientists agreed, and this time emphasized, that politicians have to do something about it, and very soon. At the Amsterdam meeting the Kyoto Protocol, which was obviously a complete farce, was ratified by almost all countries. (Legal and binding ratification had still to come.) As a result the media happily reported success at Amsterdam. People at home could therefore relax.

Also as a result of the ratification of the Kyoto Protocol, oil sales will continue virtually unabated.

The United States was one of a few notable exceptions in not ratifying the totally inane Kyoto Protocol. President George W. Bush, like his father, has a background involving Texas oil. But I think the US decision not to ratify the protocol could well have been based as much on the utter pointlessness of what was proposed as much as on a possible bias in favour of hometown oil interests. I personally believe that while ever the US remains oil fuel dependent it should source that oil from Alaska, or from anywhere else within it's own borders, despite the hugely exaggerated environmental protestations. For the United States, sourcing the oil and protecting and guaranteeing

those sources, whether they be internally or externally is a national and international security issue. Most advisors to the president unfortunately would endeavour to have him believe that Global Warming was of minor consequence. The creation and establishment of any practical alternative fuel systems is not on their agenda.

The US oil lobby surrounds him with a smoke screen too thick for common sense to be even vaguely visible. As a result Global Warming is seen as something "put out by bureaucrats" and only maybe needing "clarifying research". It seems the only picture the US President is shown is one that depicts Global Warming as somehow quite tolerable, at least for the United States of America; and apparently then only if it really does exists.

The President's bias against Global Warming considerations and illustrated by his belief that human induced fossil fuel related planetary warming is merely something "put out by the bureaucrats" was reported in *New Scientist*, January 2003.

However, to be seen politically as environmentally responsible, billions of dollars were allocated, and thus potentially squandered, on the two most unrealistic, hypothetical, Alice in Wonderland concepts in the entire energy debate, fusion energy and the mystical "hydrogen economy". See Strategy 32: **DESTROY THE NUCLEAR ENERGY INDUSTRY** and in particular Chapter 10: **THE SABOTAGING OF NUCLEAR ENERGY.**

The reality is that whether a US President ratifies any Global Warming treaty or not, it still has to be ratified by their Senate. And Senate members recognize and have stated that "Developing Countries Parties are rapidly increasing and are expected to surpass emissions of the United States and other OECD countries as early as 2015". The US Senate therefore appreciated the stupidity in committing their country to an internationally binding agreement that limited their own production of greenhouse gasses and placed no limits whatever on developing countries. Incidentally the developing countries included Mexico, Brazil, South Korea, China and India.

The US, like most Western countries, is currently hooked on oil, especially to run self-contained transport systems such as trucks and cars. To legally ratify the Kyoto Protocol, which developed from the Berlin Mandate would guarantee that all developing countries would inevitably also become hooked on oil. With no restrictions whatever placed on their use of fossil fuels, what would anyone expect? As a result in 1997 the following resolution was passed 95 to 0 by the US Senate.

United States Senate Resolution 98 states-

1. *The United States should not be a signatory to any protocol to, or other agreement regarding, the United Nations Framework on climate Change of 1992, at negotiations in Kyoto in December 1997, or thereafter, which would – (A) mandate new commitments to limit or reduce greenhouse gas emissions for the Annex 1 Parties, unless the protocol or other agreement also mandates new specific scheduled commitments to limit or reduce greenhouse gas emissions for Developing Country Parties within the same compliance period, or (B) would result in serious harm to the economy of the United States; and*
2. *Any such protocol or other agreement which would require the advice and consent of the Senate to ratification should be accompanied by a detailed explanation of any legislation or regulatory actions that may be required to implement the protocol or other agreement and should also be accompanied by an analysis of the detailed financial costs and other impacts on the economy of the United States which would be incurred by the implementation of the protocol or other agreement.*

Yet Greenhouse Warming has to stop. Therefore it has to be the voice of the American people demanding a supply of non-fossil fuels. A supply funded by the subsidies now going to fund fossil fuels and the high cost of fossil fuel related

climate damage and human suffering. In the meantime a US President will do more to mitigate Global Warming by embracing and promoting nuclear energy than by promoting the signing of some hamstringing and naïve protocol.

Yet another conference was called. In early September 2002 the United Nations World Summit on Sustainability was held in Johannesburg, South Africa. It was hailed as a follow-up to the Earth Summit in Rio de Janeiro in 1992. Again like all previous environmental world conferences it was a hugely expensive whitewash. The main beneficiary was undoubtedly South Africa, whose "tourism" revenue increased by hundreds of millions of dollars by hosting this gigantic party.

Finally, after much argument and discussion, more than 100 national delegations agreed to a 65 page Plan Of Implementation. This document was really a "feel good" bundle of platitudes in which nobody actually agreed to do anything.

The executive director of Oxfam in Australia, Andrew Hewett lampooned the Johannesburg conference as "a triumph for greed and self interest, a tragedy for poor people and the environment". Even the British representative of Friends of the Earth, Charles Secrett, labelled it "the worst political sellout in decades", which of course did nothing, but did make Friends of the Earth sound responsible.

The public relations people from the oil-fossil fuel lobby obviously did a brilliant job at Johannesburg for the conference to be so described. Although no delegates formally agreed how anything could happen, or would happen, they did finally agree on some things they thought should happen. They agreed that somehow fish stocks in the world's oceans should be restored. They agreed that half a billion more people should have access to fresh water and that one billion more toilets should be built, and both these things should happen by 2015. They agreed that it was a good thing to minimize the health and environmental impact of chemicals. But this, it was agreed, could wait until 2020. Also included in the noble Plan Of Implementation was that consumers in rich countries should consume less. The concept of promoting corporate responsibility was another less than momentous decision agreed at Johannesburg.

Increasing the use of renewable energy managed to get included in the Plan. *New Scientist* considered however, that as no targets whatsoever were set, "negotiators from the US, Japan and the Organization of Petroleum Exporting Countries (OPEC), led by Saudi Arabia could go home claiming a victory". *New Scientist* also reported with disappointment, that the final agreement completely endorsed the use and development of "cleaner fossil fuel technologies". In the same issue *New Scientist* showed a photo of a wind farm with a caption "Some of the summit's losers". That caption probably said it all!

At the conference the United States committed a minimum of $36 million "to protect the Congo rainforest". Read "to keep huge quantities of timber out of the market". The World Wide Fund for Nature (WWF) along with several supposedly "green" donors announced a contribution of $81 million to, in effect, prevent the utilization of Brazil's rainforest timbers. Mahogany is a beautiful and useful timber, so the International Trade In Endangered Species group got Mahogany trees added to their never-ending list of supposedly endangered species. But they are not in the least endangered. Brooks Yeager, vice president of the WWF, therefore maintained that the delegates at the conference made "progress on some new sustainable issues, which is great". Oil sales and sales of petrochemical products were most certainly assured sustainability. The WWF's opinion seems in complete contrast to how Andrew Hewett and Charles Secrett described this giant multi-national nonevent. (See Strategy 43: **STOPPING TIMBER AS A THREAT TO OIL AND PETROCHEMICALS**).

Then in the first two weeks of December 2003, another international meeting of the signatories to the 1992 Framework Convention on Climate Change was held. It's been dubbed COP-9, being the ninth of these annual meetings. It was held in Milan, Italy. This time it was admitted by most that the Kyoto resolutions were a waste of time.

The EU was a prime promoter of the Kyoto conference but their delegates conceded that most of the EU member countries themselves are not meeting their Kyoto treaty carbon dioxide reduction obligations. It was however generally agreed by all that anything over a 2ºC rise in global temperatures was "dangerous".

A new fix-it slogan emerged at COP-9 called "contraction and convergence" or "C&C". The "contraction" means the total volume of greenhouse gasses should be reduced. (Which had been decided almost a decade previously.) The "convergence" however is a new concept. The idea is that all countries should reduce their emissions proportional to their use. To quote *New Scientist* December 2003 the idea is that by 2050 "every citizen of the world would have an equal right to pollute". It seems the fossil fuel interests managed to again score a triumph at an international conference on Global Warming.

The British government, after much prodding by concerned scientists and meteorologists must have decided that Global Warming and climate change was becoming too serious to wait on never ending IPCC conferences. As current chair of the G8 group of rich nations they decided to call a meeting where the focus would be on the possible hazards and possible dangers of Global Warming and climate change. This time opinions were not watered down to suit the, always present, influential parties. For the first time estimates of possible extreme scenarios were not demised out of hand. This time it was appreciated that run-away Global Warming with world temperature rises as high as 11°C were very much on the cards. It was also considered that we might have less than a decade to prevent such irreversible global overheating.

Many considered sea levels rises that will be seen by people living today, could easily drown a two story building, along with all the streets and parks around it. *New Scientist* reported the details in their 12 February 2005 edition. Four pages were devoted to what scientists and meteorologists at the conference were reporting. It was like being told the Earth had cancer.

Further on in that issue of *New Scientist*, six pages were devoted to skeptical revues of what the scientists said. *New Scientist* did note that the George C. Marshall Institute (Washington DC), one of the skeptics "receives money from ExxonMobil". There were five major skeptics making the case against the scientist at the conference. Four receive money from ExxonMobil. The fifth was an oil exploration consultant. *New Scientist* did point out that "Most of the prominent organizations making the case against mainstream climate science --- often accept funding from the fossil-fuel industry." And noted that a characteristic of these organizations was that "Few employ climate scientists."

The Kyoto Protocol, although already ratified did not become a legally binding instrument on the signatories until Russia recognized its worth to them as a requirement to maintain the growth in their oil sales, and duly signed up. It became binding on its members on 15 February 2005. Australia, the biggest coal exporting country on Earth would not sign up. The United States Senate had wisely already vetoed the US from becoming a signatory to such a farcical agreement. The Kyoto Protocol, as an instrument to reduce Global Warming, is worse than worthless, as it will be used to placate responsible people genuinely concerned about our destabilizing world weather.

STRATEGY 2

LOBBYING TO INFLUENCE FEDERAL, STATE AND LOCAL GOVERNMENTAL DECISIONS AND OFFICIAL STATEMENTS

Ultimately, in a free society, a nation's decisions are made by congressmen, parliamentarians, senators and sometimes just by the president or prime minister. These people can all be influenced. But that's O.K. that's the nature of the democratic system. They are there, after all, to represent the perceived needs of their constituencies. They then in turn influence, or control, the official statements and actions of their own departments.

This is where government policy and government action is decided. Therefore, this is where the fossil carbon industries will devote their greatest efforts.

Does it really happen? Of course it does. The fossil fuel people are not fools. Their plans never include losing sales and losing business.

Here are some examples of governmental decisions favourable to the fossil carbon industries, although often disguised behind environmentally friendly facades.

UNITED STATES CAR FUEL EFFICIENCY REQUIREMENTS WERE SCRAPPED

In the early 1970s, following the Middle East "oil threat", and the subsequent oil price hike, legislation was introduced in the United States to improve the fuel efficiency of automobiles. The average fuel efficiency of the complete range of cars made by each individual manufacturer had to exceed 27.5 miles per US gallon by 1985 (33 miles per imperial gallon or about 8.6 litres per 100 klicks). These efficiency standards proved surprisingly easy to meet. The Reagan administration, for reasons we can only suspect, extended the time limit to 1990 and then in addition relaxed various efficiency requirements. The result was that in 1989 average fuel consumption per vehicle ceased declining. Fuel consumption per vehicle in the United States then began to rise for the first time in almost 15 years.

To make it worse, from the point of view of Global Warming, in the 10-year period from 1980 to 1990 funding for research on alternative energy in the United States was progressively reduced until it hit just 10% of its 1980 expenditure. And who, other than oil companies are the beneficiary of such policies? No one.

Following the Amsterdam world climate conference, the United States Federal Government, paradoxically, decided to shelve a newly proposed upgrading of mandatory motor vehicle fuel efficiency requirements. The proposed requirements would have resulted in a general decrease in vehicle size. The new four-wheel drive, chromium tractors or suburban tanks, so common on today's roads, were of particular concern. Gasoline sales would obviously have decreased had the requirements been introduced. It appears the oil companies' public relations machinery fought hard and long and successfully. They yet again prevented increasing the fuel efficiency of US motor vehicles. The US motor vehicle market is the key trendsetter for vehicle manufactures world wide, so where it moves, most will follow.

No holds were barred in the oil companies' fight. Among other things a hypothetical concept was promoted that jobs would be lost if automobiles became more efficient. The unions actually swallowed this argument hook, line, and sinker and actively opposed the efficiency upgrade. Then the even more spurious argument that bigger and less efficient vehicles would save lives was promoted. A very worthy proposal that would have resulted in decreased fuel consumption and decreased Global Warming and slowed the insidious and cancerous growth of climate change, was conveniently lost.

United States citizens never voted on the issue. The elected representatives of the people voted on the issue, and they voted, not for what was best for the people; not for what was best for the country, and certainly not for what was best for the world. They voted for those corporations who they believed would fund their next campaign.

UK GOVERNMENTS ARE EFFECTIVELY SABOTAGING ALTERNATIVE ENERGY INITIATIVES

Governments invariably proclaim they are staunch environmentalists. This keeps the voters happy. What they actually do is often quite different, and usually carefully orchestrated. Power stations are expensive things to build, irrespective of the nature of the energy supply to drive them. To fund their construction, financiers must be assured that the power generated has a reasonably guaranteed market. Prior to proceeding with the construction of a power station, long-term contracts to purchase a substantial amount of the power generated are usually a prerequisite.

Twenty-year contract periods for power sales remove much of the gamble in the decision to proceed or not.

In the United Kingdom in 1990, their Department of Energy informed the new and developing alternative energy industries that future guaranteed contracts to purchase electricity from the department would be assured, but the assurance would be limited to a maximum of just eight years. When no charge is levied for using the atmosphere as a carbon dioxide disposal dump, coal, gas or oilfired power stations can usually produce cheaper energy than the sustainable alternatives. Thus the alternative energy producers can easily be forced out of business at the end of the eight-year period.

Thus the UK Government could blithely claim it was supporting the development of alternative energy. At the same time, mindful of powerful fossil fuel lobby groups, they could feel confidently assured that large-scale development of alternative energy sources will remain an impractical dream.

Would any judicious person seriously consider investing in, for example, a one hundred million pound project, that may easily take three years to complete but with assured sales limited to a short eight-year period? Unlikely, especially when they are aware that revenue in the remaining five years from commencement of construction would be at the whim of politicians. Politicians that are too easily influenced by the wealth and the handouts from the fossil fuel industries.

The European Commission also imposed the throat-cutting eight-year limit in which renewable energy could receive any premium price. Whose side are these people on?

The very imposingly titled, "UK Non Fossil Fuel Obligation" (NFFO) was dreamed up by the UK Government supposedly to ensure the development of alternative energy sources to curtail greenhouse gas emissions. Strangely, this NFFO was also structured in such a manner that wind energy projects would not be assisted. Non-assistance for wind energy for Scotland was particularly interesting as wind speeds and wind consistency in Scotland are the highest in all of Europe. Scotland is therefore a perfect location for wind turbines.

Wind power was eventually subsidized, often up to around 4.5 pence per kilowatt-hour. Unfortunately the contracts were so short-term that wind power prices needed to recoup capital investment were so high that wind power developed a high cost image.

The Non Fossil Fuel Obligation was also structured to include nuclear energy, along with wind, wave, solar and tidal energy, as a renewable energy source. This is valid but the specific inclusion is a double-edged sword. The antinuclear weapons, antinuclear energy, antinuclear anything protesters automatically became an anti-renewable energy lobby.

The British House of Commons set up an independent Energy Committee to look at the nation's renewable energy options. The Energy Committee found that almost three-quarters of all government-funded research on renewable energy was, somehow, funnelled into exotic and unnecessary nuclear research, usually fusion energy. Fusion research is a never-ending money sink and had then (and still has) negligible prospects of producing usable anything in any foreseeable future. Fusion research is undoubtedly the least cost effective of all nuclear energy research and therefore produces a minimal threat to fossil fuel. Was research into conventional and practical nuclear fission energy and non-controversial alternative energy sources deliberately starved of taxpayer's funds, or is that just another convenient coincidence that again suited the fossil fuel lobby?

EUROPEANS ACTUALLY CREATED LAWS THAT COMPEL FOSSIL FUEL USE

Biofuels are fuels made by producing high-energy liquid fuels from farm grown crops. Biofuels are hydrocarbons and so produce carbon dioxide when they burn. However this is merely returning to the atmosphere the carbon dioxide originally consumed by the plant as it grew. It's a safe, carbon-dioxide-neutral, closed cycle.

Methanol, ethanol, biodiesel, bagasse and of course wood are biofuels. Biodiesel is produced by chemically combining ethanol with a vegetable oil such as palm oil. Biodiesel is a significantly better fuel than petroleum based diesel. Bagasse is the fibrous material waste remaining after crushing sugar cane. The total quantity of carbon and carbon dioxide in the Earth's biosphere is unchanged by the burning of biofuels. See Chapter 11: **ENERGY SYSTEMS WE USE NOW AND WHAT WE MUST USE TOMORROW**, and also Strategy 29: **BIOFUELS ARE A MAJOR THREAT TO OIL, COAL, AND GAS.**

The EU obviously should support the large-scale introduction of such fuels to stop Global Warming. However, it is obvious that the European Commission can hardly be described as magnanimous in their support for energy alternatives. By 1992, the EC had "allowed" ethanol derived from wheat, maize, beets or potatoes to be added to fossil fuels to power motor vehicles. But only 5% of ethanol was allowed to be added to conventional oil derived fuels. So in effect the European Commission insisted and mandated that 95% of fuel for spark ignition engines (petrol engines) had to be fossil fuel based. This is despite the fact that ordinary motorcars run fine on blends containing up to 25% ethanol; as in Brazil. This again illustrates the frightening power of the oil lobby.

Australia is a major sugar producing country. One might presume that ethanol would be a significant component of motor fuel in this country, but it's not. When this was recently proposed The Australian Labor Party – the major left wing party in this country – coerced the ruling right wing party to nationally legally limit the ethanol content in petrol to a maximum of 10%. The much-publicized argument being that ethanol was somehow harmful to car engines. Its catch-all suggestion was that more research was needed. Today almost every major automobile manufacturer in the world – and at no extra cost – produces motor vehicles tuned to run on either straight ethanol or ethanol blends – some even on both. What further research is needed? See Strategy 29: **BIOFUELS ARE A MAJOR THREAT TO OIL AND GAS** and Chapter 11: **ENERGY SYSTEMS WE USE NOW AND WHAT WE MUST USE TOMORROW.**

The French, in isolation, and to their great credit, had already exempted biofuels from fuel taxes until 1996. It was expected at the time that after 1996 the tax break would be structured to continue indefinitely. But oil companies always fight such incursions on their domain, and invariably win. In 2000 British Petroleum (BP) took legal action against the French claiming French subsidies for biofuels were damaging their business. BP won. The case was reargued on technical grounds and the French won. So some French subsidies on biofuels still exist. The message is clear; in general the Europe Union does not encourage biofuel use. True, sometimes the EU will "allow" their member states to assist biofuel production. But any claim that EU governments are genuinely concerned about Global Warming is a joke.

The Environmental Energy Agency of France, the ADEME, was enthusiastic about the use of biofuels, including the use of canola oil (rape seed oil) to produce the biofuel RME (rape methyl ester). Actually ethanol derived rape ethyl ester or REE is preferred as ethanol is easily obtained from distillation of sugars and carbohydrates. The ADEME fell within the influence of the European Union, so a German group from their Federal Environment Office, the UBA in Berlin, tried to convince people that biofuels are somehow pointless. They made irrational and irrelevant claims that burning biofuel, particularly RME, produces as much greenhouse gas emissions as burning fossil fuels. Of course it does, and of course it goes into the atmosphere, but the next crop to make the next batch of biofuel extracts it all back out again. This childish argument made the German Federal Environment Office, the UBA, look either just a little corrupt, or stupid.

The German team at the time also gave the dire warning that the growing of crops to produce biofuels, and the widespread use of biofuels, would dramatically increase the use

of agricultural chemicals, namely pesticides, herbicides and fertilizers. This additional piece of monumental nonsense had to have been based on the agrochemical industry's own, much proclaimed, rhetoric, that commercial crops are impossible to grow without the widespread use of agrochemicals.

A PUSH FOR BABY POWER STATIONS

Nuclear energy power stations of course do not use fossil fuels and they are sizeable complexes. To beat them the fossil fuel lobby uses their antinuclear movements, their green pawns, to do the job of prevention. But in case that might fail, as the public begins to realize how insanely exaggerated are the relative dangers of nuclear energy, other ploys might be needed. It would be clever policy for the oil lobby to actively encourage a fundamental switch from large power stations to a conglomeration of small independent fossil fuel powered electric generating facilities to augment the nation's power supply.

Being small, these independent power companies could be located in local counties or shires, and even in or near towns with minimal justifiable opposition from the local citizenry. The very valid argument being that if they want electric power in their town they should be prepared to accept a small measure of local pollution. And for the PR exercise it would be best if the stations were locally owned.

For the fossil fuel lobby it is a pleasant and very saleable concept with many advantages. Dozens of small independent fossil fuelled power stations could be set up across the country, and they would be very hard to close down. The small stations would have the argument that they only established themselves in the neighborhood to help keep the electricity flowing. The fossil fuel lobby, in the "defence of free enterprise", could then rally behind the "independents" to fight any suggestion of possible removal. The political and media influence the fossil fuel lobby has, could then make the removal of the independents a politically and financially expensive nightmare.

For the fossil fuel suppliers it is clever marketing to make small independent power stations the flavour of the month, and thereby keep oil and gas sales bubbling. A move to mini-power stations has already commenced in the US. All are oil or gas fuelled.

We should not forget that smaller power stations are generally less efficient so ultimately more fuel , either oil or gas will be needed. Oil and gas are about equal as producers of greenhouse gasses. Supporting the concept of the introduction of a multiplicity of small independent fossil fuel power stations is logical, astute and far-sighted marketing by the fossil fuel establishment.

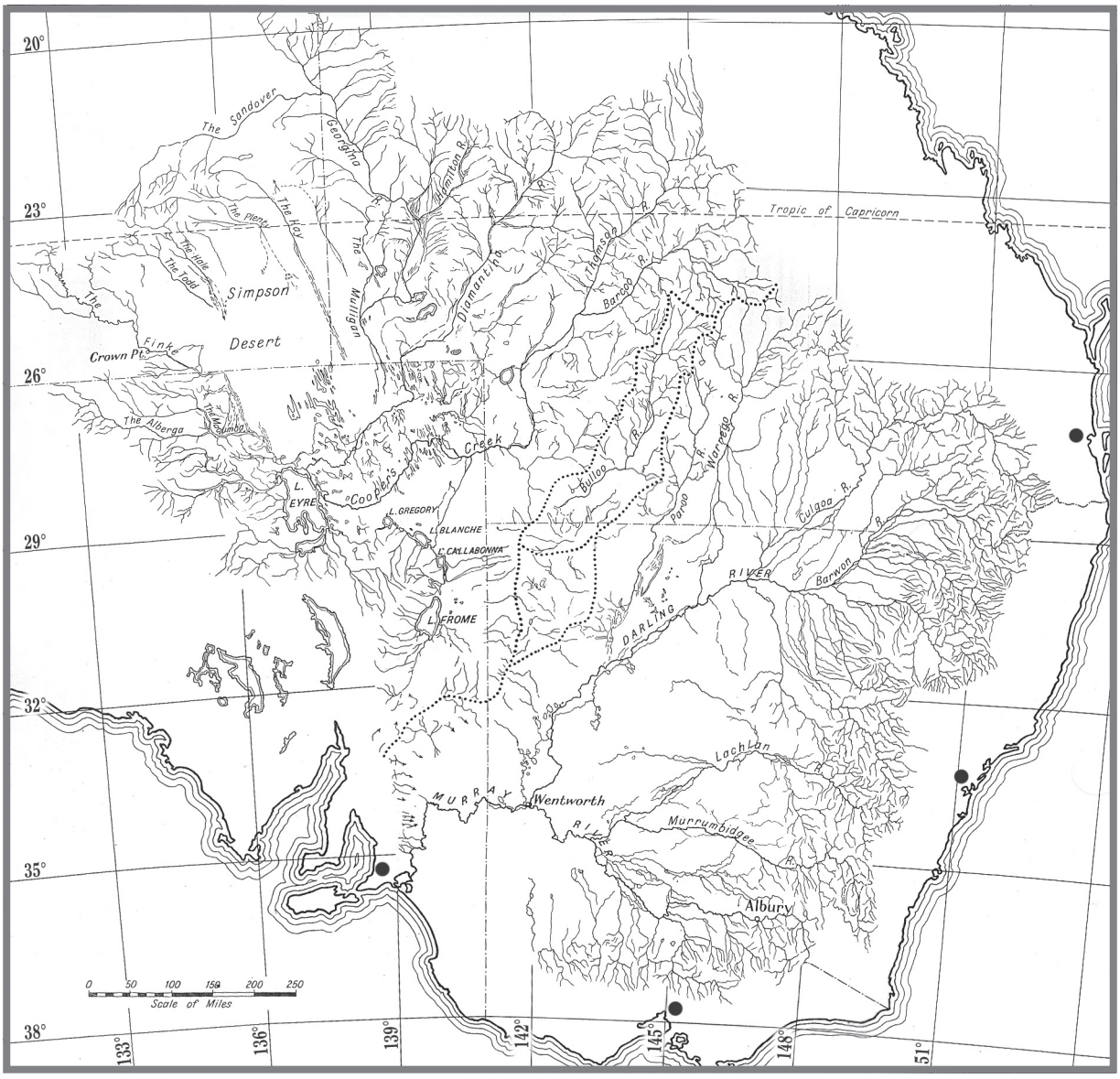
THE GREAT AUSTRALIAN RIVER SCAM

The Australian Great Dividing Range separates the narrow eastern coastal belt from the vastness of the Australian Inland. The range is rarely more than four thousand feet (1,200 m) high. Between this range and the Central Australian deserts is an area defined as the Murray-Darling Basin. It is a catchment area the size of Alaska, or Mexico, or Central Europe.

All running water in the area ultimately drains into the Darling River, the Murrumbidgee River and Murray River systems. The water then exits via the Murray to the Southern Ocean just east of the city of Adelaide. Rainfall throughout the whole region ranges from below 10 inches up to 30 inches per year in places (250 mm and 750 mm). From an agricultural perspective the rainfall is not particularly low; but it is frustratingly irregular.

It is a huge farming area and is already a big market for the agrochemical industries, and they are positive that sales could be increased many fold.

Apart from during the rare storms and floods, most of the maze of inland rivers are never more than a series of water holes and billabongs. Few flow consistently. It has been like that, on and off, for thousands of years. Over the last century, hundreds of earth wall farm dams have been constructed in small on-farm valleys to augment the water holes and billabongs for stock



THE EASTERN AUSTRALIAN INLAND RIVER SYSTEM.
The creeks in the above drawing are fed by thousands of primary valleys. The area contains thousand of individual farms. A monstrous, all pervading, relentlessly expanding carefully structured bureaucracy will control and limit the storage and use of rainwater falling on every single farm in that vast area. Today, in "a land of droughts and flooding rains", that bureaucracy is hopelessly frustrating the improvement of soil fertility in an area bigger than France, Germany and Italy combined.

water through drought periods. This has been a serendipitous benefit for thirsty native fauna whose populations, in many cases have exploded. Many of these farm dams and larger water holes are used for on-farm irrigation.

Through all those long ages of droughts and floods, the water holes and billabongs and later the new farm dams, stayed fresh and healthy, and were full of fish.

Typical of most of Australia, the soils in the eastern half of the continent are predominately phosphorous deficient. Small applications of phosphate fertilizers corrected this and the soil biology and soil fertility benefited. Soil organic

matter content started to increase following Australia's general abandonment of the soil inverting mouldboard plough beginning in the 1950s. This is discussed in detail in Chapter 8: **HOW WE CREATE FERTILE SOIL TO HALT GLOBAL WARMING.**

Following World War II, the agrochemical companies started marketing their products in earnest and sales boomed. Crop yields rose in the Murray-Darling Basin for a period and simultaneously, soil organic matter content fell. Unfortunately, most agrochemicals and fertilizers dissolve in water. Ultimately and inevitably in inland Australia, the chemicals migrate into the intermittent, low-flow river system and the water holes and billabongs. Many became polluted by the excess nitrates and phosphates often poisonously coupled with pesticides, herbicides and fungicides. Phosphorus dependent poisonous blue-green algae proliferated. During low rainfall periods dead fish float to the surface in their thousands. The phenomenon is also becoming widespread in Western Australian streams and rivers. For the agrochemical companies the pollution problem became no more than a marketing problem and as such, an exercise in public relations manipulations.

How did it work. First the misnomer "agricultural nutrients" is used to describe agrochemical pollutants. The PR gurus then systematically attribute the poisoning and the algae growth to the accumulation of these "agricultural nutrients" in the river water. To these effects are added the vision of discharge into the rivers of sewage from inland towns. The message becomes; firstly it's not the fault of agrochemicals and secondly, it's unavoidable anyway.

But that is all fiction. The agrochemicals are not nutrients, and town sewage is never dumped into rivers. In all Western societies sewage is always treated, and although it is not used in food or other plant production it is very rarely dumped into rivers. Inland shire councilors are generally responsible people and invariably go to a great deal of trouble to ensure town sewage waste is released as far away as possible from their local rivers; not into them.

In any case, treated or untreated sewage, spread onto or into the soil, is a fabulous soil fertilizer. If sewage was the cause, or a major contributor to the formation of blue green algae then the crowded paddy fields of China and Vietnam and most of South-East Asia could not have lasted a thousand years or more. No way! It is also quite ridiculous to consider agricultural chemicals as nutrients. They are either stimulants, or they are poisons. They are never nutrients.

Wise and concerned people have lamented the deterioration in water quality many of us had seen in our own lifetime, and justifiable, there is genuine concern. The reality is that the massive and continuing use of agrochemicals is the root cause of river water quality deterioration in all Western nations. Of course this, as you might have noted, is never publicized.

The logical answer to stop the poisoning of Australia's inland waters is to stop using agricultural chemicals and fertilizers. Or at least, massively minimize their use.

This solution does not suit the agrochemical industries at all. So they dreamed up another answer. The agrochemical industries realized they needed to turn the entire Australian inland river system into a fast flowing sewer to dispose of the agricultural chemicals. Flush the poisons away into distant Southern Ocean. It is therefore necessary to boost river flow rates as much as humanly possible. If not, the accumulation of agricultural chemicals will cause an unwanted embarrassment and that would restrict agrochemical sales.

Could all this really be true? Well let's see what has happened.

For some apparently unknown reason, some "green advocates" and their organizations in the late 1990s, suddenly decided that Australia's inland rivers had to be "saved". The rivers had to be "cleaned up". They had to "run free". Funds to back the cause and support the publicity just as suddenly became available. Protesters waved their banners. Governments were lobbied. It was made to sound like such a worthy cause, and it all sounded so plausible and so noble. Signatures

were collected from the concerned (but obviously unwary citizens). Petitions were submitted to state and federal governments.

The result of all this is that, although Australia is the driest continent on earth, laws have now been enacted to prevent farmers building simple earth dams on their own land and using the water to grow grasses and crops and improve the quality of their soils. As an example, in the central eastern state of New South Wales a new law decrees that 90% of the rain that falls on a farm and forms visible run off has to go into flushing the river system. It is the new "Farm Dam Policy", as laid down by the New South Wales Department of Land and Water Conservation. This piece of crazy government irresponsibility became enforceable on the First of January 1999. The farmer is allowed to keep a tiny 10% of runoff rain, even when that rain falls on his own land!

The "Catch 22" is that decent runoff only occurs when rainfall is so high as to be near flood proportions and then there is a consequent massive excess of water flow. But the farmer is still not allowed to store and use these rare storm rains and floods.

It is endlessly promoted by powerful lobby groups and many government bureaucrats, that

Author (right) with Rob Borbidge (former Premier of Queensland) inspects our solar thermal project. Rob Borbidge did not believe in imposing dictatorial regulations on the farming community, as has happened with the Australian river scam.

farmers are so irresponsible that they cannot be trusted to manage the rain that falls on their own farms. With this madness Australia's rare and valuable rainfall is effectively mandated to escape to the sea, and as quickly as possible. The only beneficiary to all this madness is the agrochemical companies, whose poisonous accumulations are hopefully flushed away.

North of New South Wales in the semi-tropical state of Queensland, there are new laws just as conniving. Much of the southern area of Queensland also drains into the Murray-Darling Basin. The Queensland Government decided that the rain that falls on that State, anywhere in the State, belongs to the State. At this time of writing, legislation to this effect has been enacted. If the rain actually soaks into the soil the farmer is allowed to keep it. Otherwise it is the property of the State and will be allocated by the State, undoubtedly through their entourage of bureaucrats and administrators.

Farmers can request, by suitable procedures, and using the nominated forms, and if they pay an additional tax, farmers are permitted to keep more than the 10% of what is in reality their own water. The tax is charged in the form of an extra water allocation licence, which of course, can be controlled by those with influence over governments. In Queensland it's called the Water Allocation Management Program or WAMP. Could we say it's therefore administered by "wampers"?

The legislative structures are such that these same insidious restrictions apply to the short, faster flowing rivers on the narrow eastern Australian coastal belt. The wetter coastal belt farms can afford more chemicals, so the only possible benefit for this inclusion is so even more agrochemical run-off can be flushed out to sea. And most of Queensland 's eastern rivers flow into the waters of the Australian Great Barrier Reef.

It is incongruous. An Australian farmer is legally allowed to poison his soil and the nation's rivers and even the Great Barrier Reef by spreading absolutely unlimited quantities of chemicals over the whole farm, but he is forbidden to store and

spread life-giving water. Surely this is shades of George Orwell's *1984*.

When the British controlled India they imposed a salt tax. So the ludicrous inevitability was that Indian citizens were not allowed to drink or taste seawater. They were not even allowed to go swimming in case they drank some. So now, in Australia, when "raindrops keep falling on my head" and those raindrops don't manage to soak in, they are subject to an inane and unjust state water tax. It seems that Australian farmers now need their own Gandhi.

Even the Federal Government has become party to the scam. It is now a Federal initiative that the Murray-Darling River system, the system that drains the majority of the eastern half of the Australian continent, is going to be "managed". The declared objective is to increase the flow rate in these two river systems in an endeavour to improve "water quality". This is insane. Australia does not need this stupidity. The build up of agricultural chemicals and the release of salt from poisoned soils are the problems. Problems that are the inevitable result of the destruction of soil fertility caused predominately by the expansion of high levels of chemical based agriculture.

"There's none so blind as they that won't see." Jonathan Swift 1667-1745, Anglo-Irish satirist and author of *Gulliver's Travels*.

STRATEGY 3

SELECTING NOBLE BUT IRRELEVANT ENVIRONMENTAL ISSUES AND BEING SEEN TO BE GREEN

As false as it is, whenever and wherever possible the companies in the fossil carbon industry must, and will always portray themselves as the epitome of, and the guiding light for, environmental responsibility. They must create an image that "big oil" and "little people" are united and together in a quest for a cleaner world. What a fiction! Read the fine print in their advertisements. Read the fine print in their press releases and recognize the real motives. With almost criminal cynicism they are trying to engender in us a belief that, as far as this planet and its climate are concerned, they are on our side.

The fossil fuel/petrochemical industries manufacture and produce the majority of the products and commodities that are destabilizing this world's climates. They know full well that unless extreme care is taken, a public image of their industries will develop that could prove quite disastrous in the marketing of oil and natural gas and all the products derived from them. For them it is absolutely essential that this disastrous image is averted for as long a time as is possible. The fossil carbon lobbyists know the consensus of public opinion must be continuously shifted in directions that assist their marketing requirements. They also know that individuals have different opinions and different beliefs, so promotional material must be broad based and have wide and unarguable appeal.

Solar powered motor vehicles are a perfect concept to use to create such a risk free and desirable image. Onboard solar power systems can never power the family car. It's totally impossible. So the oil companies give full support to solar powered vehicles. In this way the big oil companies appear to foster some "new and friendly environmental age". A race on a good road, across the dry desert centre of Australia, in a solar powered vehicle, with winning speeds of sixty miles per hour or one hundred klicks, gets great and controllable publicity. These races are now a regular occurrence. Supporting such events is designed to indicate a high degree of responsibility and environmental concern. And that's just what the oil companies want and need.

Public opinion polls show most people think solar powered motor vehicles are a great idea and viable. That's good. A consensus will also show that many believe solar vehicles are not only desirable, but also inevitable. That's even better. Such imaginings beautifully defuse unwanted concern over the ultimate inevitability of Global Warming with its horrendous climate changes.

However, let's be sensible and not blinded by

media hogwash. A lightweight standard sized motor vehicle would have a total surface area of about one hundred square feet. That's about 9.5 sq metres. Let's consider the entire area being completely covered in solar cells. Let's assume all those cells have the maximum theoretical efficiency possible, about 36%. The practical maximum is actually around 25%. Let us also assume that the cells are swivel mounted so they always face into the direct sun. Let's also assume that our solar vehicle is being used in the tropics, at midday, with no clouds and no passengers and just a lightweight driver. Under those sunlight conditions the peak power output of the solar vehicle will be four and a half horsepower, or 3.5 kW. If you get hot driving this car, that's too bad, you can't turn on the air conditioner. Turning on an air conditioner would leave no power to run the car. It would stop, so no air conditioner.

If this ultra lightweight, pancake shaped vehicle contained a huge bank of batteries, power could be saved up to boost performance for short periods of needed acceleration. The gadgetry would require about 10 hours in the tropical midday sun for one hour of non-airconditioned driving.

A typical small four-cylinder automotive petrol or ethanol-powered engine produces a maximum of about 50 horsepower or 38 kW. Less power available and the vehicle becomes impractical. Of course it can be argued that you don't need the maximum output of the engine all the time you're driving but sometimes you do. With a solar powered car it is very difficult to have the entire surface area of the car constantly facing a tropical midday sun. In the early morning or late afternoon the solar array would act like a sail and in a strong wind the car would blow over. The solar car will never happen. The concept is a PR production. It's utterly unrealistic.

The big market in automobiles at the moment is for overpowered, four-wheel drive, quasi off-road vehicles weighing several tons. Immense machines designed to travel for hours, carrying the dog, or the whole family, or the shopping and the toys, all as advertised in comfortable, air-conditioned, protective custody.

Ask any marketing person in General Motors, Toyota, Mercedes Benz or any other motor vehicle manufacturer if they think the general public will be happy to buy a 4.5 horsepower family car that can't even carry the smallest family. Especially when their potential buyers understand that 4.5 horsepower is about what is needed to run the car's air conditioner.

The oil companies are not fools, they are well aware that solar powered vehicles are totally impractical and no viable market for them could ever exist. A motor vehicle has simply too little surface area to be able to run on sunlight. It is easy and eminently practical to replace petrol and diesel fuels with non-fossil fuels. Spending time and money on solar vehicle concepts is clever and logical oil marketing. It is not practical and logical research. It's simply a continuous distraction. See Chapter 11: **ENERGY SYSTEMS WE USE NOW AND WHAT WE MUST USE TOMORROW.**

The oil companies' predisposition to solar powered motor vehicles and the publicity they direct towards them, must be seen for what it obviously is, nothing more than an exercise in "green" image building and public relations.

The oil companies are well aware that a continuous preoccupation by the media, by academia, and in consequence the general public in solar powered motor vehicles happily ensures a continuing market for gasoline. Additionally, it also ensures a supposedly responsible image for the whole oil industry.

STRATEGY 4

USING ADVERTISING EXPENDITURE TO OBTAIN SUITABLE EDITORIAL

In the oil industry, a huge amount of money is spent on advertising. They blatantly use the power of this money to influence relevant editorial and the "message" in reported news. It's all to encourage the sale of oil and petrochemicals, and to ridicule and deride alternative concepts. Usually a very minor change in editorial material can

achieve the oil lobbyists' desired results, and in general, editors are prepared to accept these minor, but meaningful changes.

The advertising manager in any media organization is a powerful person. Many of them will do almost anything to sell advertising space and they are the ones that most influence the editors. Look at any newspaper report and look at the wording. By changing just a few words it is so very easy to alter the meaning without changing the broad nature of the article. Sometimes something as minor as a comma can change praise for an alternative energy system, to ridicule.

I know this inter-relationship between advertising and editorial from experience. In manufacturing it is common to receive notification from newspaper and magazine publishers informing you that by buying sufficient advertising space, comparable editorial space will be made available. And that editorial you can generally write yourself. What you write is printed up as a news item. What is in that space is read as reported news – but it's not. Imagine a scenario when huge advertising dollars are involved. Imagine the "news" space the oil and petrochemical industries can demand.

A friend of mine kept an article he personally thought was a typical example of how editorial can be used to knowingly or even unwittingly to placate fears of Global Warming. It was a newspaper clipping from the Victorian *Herald Sun* newspaper of 4 July 2001. The large headlines at the top of the page read, "**OCEANS CAN SLOW WARMING**". The by-line told us the writer was an "environmental reporter." The article stated that "coral reefs may not be degraded by increasing atmospheric carbon dioxide levels as previously believed" and in fact it might actually be "creating more reefs". At the very tail end of the article it reported that the scientist being quoted also "warned that his findings provided no good reason to continue filling the atmosphere with large amounts of carbon dioxide". The message in the headline was clear and would surely placate anybody's fear of rising seawater temperatures damaging coral reefs. But for a correct interpretation the article had to be read in its entirety. The grim reality is that the Global Coral Reef Monitoring Network based here in Australia estimates that 25% of the world's coral reefs died in the past few decades and it's obvious when you swim over them. Another 25% are expected to die over the next 20 years. The worldwide collapse of coral reef structures is attributed to both rising seawater temperatures and agrochemical overload from adjacent river systems.

STRATEGY 5

USING THE THREAT OF POTENTIAL JOB LOSSES TO SUPPORT THE STATUS QUO

Towns and cities and even entire national economies have become established around fossil fuel mining operations. The fossil fuel industries always endeavour to stop or slow the growth of alternative energy systems. If all else fails, then local politicians can often be manipulated into endeavouring to protect "mining jobs in their area".

The fossil carbon companies often have their minions imply and argue that any rapid global change away from fossil fuels to sustainable energy and sustainable agriculture might cause a "devastating world depression". You may have noticed, that phrase is often used.

An ongoing theme, also constantly promoted, is that higher oil prices will cause a world depression. Why do that? The subtle message is that low oil prices are the foundation stones of a thriving world economy. The perceived implication being actively generated is that a switch to any slightly higher cost and non-fossil derived energy system will therefore plunge the world into a depression. This is non-sense. Oil prices have not been low for a quarter of a century, and for all that time they have been way above actual production costs. A rise to US$57 for a period during 2004 had almost negligible effect on the world's average income. Most economists think it's ludicrous to suggest that an oil price could cause a world depression.

Oil pricing policy will always be structured to guarantee both an assured and a monstrous income to oil producers. Nevertheless there is an upper limit. It is set by the threat of competition. Oil prices are therefore structured to be just below those of non-fossil fuel alternatives, whatever those alternatives might be. Their policy must be to constantly discourage any threat from alternative fuel and energy systems.

But sensible, practical alternative energy systems are here now, so the oil producers need and utilize their financial muscle and market manipulations to keep the expansion of alternative energy systems to an absolute minimum.

It is often claimed or even stated categorically in structured editorial and news reports, that even a minimal switch to alternative energy systems will cause catastrophic job losses, especially in coal mining towns. The resulting generated fear can be used to create confusion and force major delays. In some areas it could curtail any progress whatsoever towards a sustainable environment.

The reality is that mining towns are established because a commercial geological deposit of – whatever – has been located in the area. When mining operations commence a work force is needed. People move into the area. A new town booms. But no matter what happens, the town only lasts as long as the mine lasts. It is the same whether it's a silver mine, or a coal mine, a gas field or an opal deposit. Look at history. In Australia today there are many small towns with just a few thousand population. In their boom, at the height of the gold rush periods in the mid to late 1800s, often as many as a hundred hotels or saloons would exist in the town and they would operate twenty-four hours a day.

The Australian gold rush started when gold mining was finally legalized in an effort to slow the 1849 mass migration across the Pacific from Australia to California. Australians were joining the "forty-niners". Gold was "officially" discovered in Australia in February 1851. The unbelievably rich deposits unearthed on both sides of the Pacific generated a constant each way flood across the ocean of hopeful "diggers" chasing every new field discovered.

Wherever it might be, when the ore body runs out the miners abandon the town in droves. Often only a ghost town remains. That is the end reality of all mining operations and it will always be so. But not so with non-fossil fuel facilities, with non-fossil fuel energy systems the likelihood is that jobs will be created, not lost and those jobs are likely to be much more permanent.

STRATEGY 6

THE PLOY OF INFERRING GLOBAL WARMING IS NOT HAPPENING AT ALL

This ploy was used extensively through the 1980s and 1990s, but now visible and active promotion of the argument that Global Warming does not exist is beginning to look foolish or naïve. However, some people still like to believe Global Warming is a fiction. Therefore, any statement to support the fiction, especially by somebody newsworthy, will be quoted by the fossil carbon companies' public relations people whenever and wherever possible. This can "justify" such beliefs and help create doubt and confusion.

Speculation about some hypothetical imminent ice age is great anti-greenhouse public relations material. The oil sales people will always endeavour to give such speculation prominence. It justifies the "not happening" concept and further helps promote feelings of confusion and uncertainty and consequential disinterest. Being cynical, one might ask who suggested that the themes of the latest crop of disaster movies be centred on global freezing? No matter where you look, suppressing proof of dangerous and insidious climate change and Global Warming seems to be an ongoing exercise in public disinformation.

The cold hard fact is that ice volumes around the world have dramatically declined since the mid 1950s. As an example: over the last two decades there has been severe thinning in the Arctic ice layers and in just in one ten-year period – 1977 to 1987 – twenty-foot thick ice (6 m) had thinned to about thirteen feet (4 m). United States

Navy submarines have for years collected invaluable data on the deterioration in Arctic ice. It was never published. That data clearly shows the frightening effects of Global Warming. No national security was involved (at least militarily) so for what reason was the information restricted? US military policy simply mandated that such information should not be released. Who benefited from that policy? Fortunately the policy has now mellowed and the unpleasant facts are now more readily available.

When the first George Bush was President of the United States, he made far-reaching decisions constantly in accord with the wishes of the big oil companies. Like Margaret Thatcher in the United Kingdom, President Bush invariably quoted the George C. Marshall Institute in Washington, DC to validate US policy on Global Warming. This pro-oil organization has always been vociferously opposed to the whole concept of Global Warming and dangers associated with it. For a period they seemed to claim both that Global Warming didn't exist and that Global Warming dangers were exaggerated; an interesting piece of "double think".

A notorious report, often cited to erase greenhouse fears in anybody becoming concerned, is one co-authored by William Nierenberg, Director Emeritus of the Scripps Institution of Oceanography at La Jolla, California. This 1989 report was entitled "Scientific Perspectives on the Greenhouse Problem". Surely it's not a coincidence that this report minimizing global greenhouse concern apparently was written for the George C. Marshall Institute. Surprisingly in this report, Nierenberg concedes that he does "believe that there is a Greenhouse Effect due to anthropogenic emissions of carbon dioxide".

The Intergovernmental Panel on Climatic Change presented a range of theoretical global temperature rises based on a doubling of atmospheric carbon dioxide levels. Nierenberg reviewed this report and admitted his "preferred estimates" are very much "near the bottom" of the IPCC range. He suggested, (possibly to take the heat off carbon dioxide emissions) it was more logical to worry about cutting CFC emissions first. Concentrating on CFC reduction is certainly more "logical" for the oil companies, as whatever is done with CFCs it can never decrease oil sales.

Nierenberg hammered his point with phrases like "there are no valid results on changes in probability of extreme climatic events". In other words, "let's pigeon hole the problem for a few more years and see what happens".

Those few years have now long since passed and the existence and severity of Global Warming is almost becoming generally acknowledged.

STRATEGY 7

CLAIMING THERE ARE NO SIGNIFICANT OVERALL CHANGES IN WORLD WEATHER PATTERNS.

The majority of informed people are now beginning to accept that Global Warming is a reality and is causing climate change. The fossil fuel lobby counter in several ways. One is by publicizing old historical weather disasters, with associated editorial to make it dramatic and frightening. The logical public relations objective is to create in the public mind the feeling that "it's all happened before and despite it all, we still survived". It's promoting the Australian expression, "She'll be right mate."

I grew up believing that in general the world was a fairly benign place, where, omitting politics, human beings could live just about anywhere on the whole planet in reasonable comfort and security. True, there was always a measure of risk, some places worse than others. There was the odd volcanic eruption; there was the odd earthquake, and of course the possibility of a tsunami. These things were sometimes very deadly and almost always totally unpredictable in the short term. But living in such areas is often a matter of choice. We knew where we lived. We knew the local conditions and we knew local weather. And we could plan for, or ignore both.

Sure, there were a few places where the environment was not at all friendly. We accepted

that. At the North Pole and South Pole it was extremely cold and most inhospitable. You couldn't grow any food there, and it was night-time the whole winter through. There were also a few deserts, the Sahara Desert, the Gobi Desert, Death Valley, parts of Central Australia, which were most inhospitable. However, you could still build railways, build roads and lay oil pipelines across them if necessary. Then there were jungles. Jungles were hot, wet and stagnant, smelly and timeless, especially timeless. But we understood all that.

That's how it was.

But things have changed. The weather and the climates across the world are suddenly becoming inconsistent, and frightening, and unpredictable. Now we can no longer plan for the seasons ahead. We can no longer rely on the harvest.

It's going to be very costly and very time-consuming to cater for this new and never-ending unpredictability. All of us will pay for it. We will pay in increased insurance premiums, in reduced standards of living and many by increased illness and premature death. And some want us to believe it's all not happening. They want us to believe things are normal.

The producers and marketers of fossil carbon materials don't want us to appreciate the real costs of our current dependence on extracting ancient buried waste. They don't want us to even suspect that world climate is massively destabilizing.

How do they manage to confuse and defuse the issues? What games are they playing? What are their ploys? One way of doing this is to convince us that we are not destroying stable weather patterns at all. The ploy is to convince us that stable weather patterns never existed in the first place. In that way Global Warming becomes just another one of the natural events that periodically plague our planet, like earthquakes, tidal waves and volcanoes.

The problem for us, and therefore for our world, is that with many of us, they are succeeding. We are all being herded like sheep into a new attitude, into a new belief. The image being created is that the world is actually a very unstable place, a place of constant change. An image is being established that it has always been like that, and always will be. True, our Earth is constantly changing but major changes result from slow geological movements. Those changes were generally so slow that natural evolution could handle the changes. Species had time to evolve and survive.

But sudden changes, species can't handle. The dinosaurs proved that by their demise. Sadly Global Warming is creating the worst possible scenario for life on this planet; not just a sudden change, but centuries of endless change, a future of endless instability.

We are being conditioned. Many young adults are now growing up with an intrinsic conviction that this current deluge of droughts, fires, floods, tornadoes, hurricanes and typhoons is the norm.

True, such events have always been with us, but not as now in deluge proportions. There has always been the freak statistical event, the hundred-year flood or whatever. That was the norm. It is the savagely increased frequency and intensity of such events that is now, so definitely, not the norm. Insurance companies are very aware of the changes. They have their statistics. They know what is going on and adjust premiums to suit. Then soon they re-adjust, for insurance companies work on pure numbers and pure probabilities, and from counting the actual events and the actual payouts they are anticipating bigger claims, accelerating in size and number.

Sometimes some oil and petrochemical companies do concede that there "might" be a few more "natural" disasters nowadays. And if, (and they emphasize the "if") there are a few more natural disasters, it just possibly may have something to do with the "slight" increase in world temperatures. Temperature rises that some people, (the oil companies always imply are of doubtful reputation) label "Global Warming". That's been their line for the last three decades.

It is now time we cease being fooled by such blatant image manipulations and start looking at reality.

STRATEGY 8

PROMOTE GLOBAL WARMING AS EITHER BEYOND OUR CONTROL, OR A NATURAL PHENOMENON

Ultimately, when it becomes totally accepted that Global Warming from anthropogenic factors is indeed a reality, people might decide to act. Good marketing strategy is then to have people believe it is such a huge problem that it simply cannot be prevented. Have people accept that they have to learn to live with it. Oil sales can then continue almost unabated. Some slight short-term abatement is necessary as a PR exercise. It's astute marketing. It's good politics. It's to have people believe genuine efforts to prevent climate destabilization are actually underway. Responsibility is thus being demonstrated. We can relax.

Are we to believe the big oil conglomerates are endeavouring to help protect the planet from themselves? "Not bloody likely!"

Since we are at the tail end of an ice age the argument often takes the form that the rising temperatures we are seeing are just a normal part of ice age cycles. This is somewhat similar to the previous strategy, and they like to work them in concert. This concept promotes either a fatalistic acceptance, or alternatively, a "wait and see" attitude. It also endeavours to divorce responsible people from their own sense of responsibility. The oil and coal companies have to foster such concepts, for as far as they are concerned the greater the confusion, the better for continued world fossil fuel dependency.

The facts are: What we are experiencing now and what we have been experiencing over just these last few decades, has not occurred ever during any of the previous ice age cycles. Nor has it occurred at any time in the last one million years. That is the reality. The information is there to see. Researchers have techniques now that can determine conditions back a million years. The information shows the warming the Earth is now experiencing is not part of any previously known, or even suspected long-term pattern. It's not a natural phenomenon at all. It's our fault. We made these happen and we can stop them happening. Don't ever believe we can't. See Chapter 3: **THE ATMOSPHERE, ICE AGES, SUNSPOTS, INTERNAL HEAT AND VOLCANOES.**

STRATEGY 9

CLAIMING EL NINOS ARE THE PROBLEM, NOT GLOBAL WARMING

It is a sensible objective for fossil carbon public relations organizations to dissociate carbon dioxide builds up from climate change. For the fossil fuel industries, the El Nino phenomenon becomes a wonderful scapegoat. All they have to do is make the El Nino phenomenon the culprit and blame El Nino events for the way world weather is destabilizing. Additionally, it must be inferred that El Nino events are unrelated and unaffected by Global Warming.

The fact that El Ninos have occurred for centuries and sporadically for millennia makes it easier to dissociate the two phenomena. El Ninos occurred before we started burning fossil fuels. It is therefore both easy and correct to associate El Ninos with climate irregularities. There is abundant scientific data on the structure, the behavior, and the results of El Nino events. El Ninos also occur over short enough periods for people to be aware of them, to observe their effects and to have them as a topic of conversation. El Ninos have been around for a long time and therefore unrelated to Global Warming. This all sounds OK but what is never mentioned is the pattern and the frequency of recent El Ninos, and they have changed dramatically. What is never mentioned is that El Ninos have taken on a totally different form and life cycle. We can no longer predict when they will happen. It is now impossible to predict what the next one is going to be like.

We could once.

But if those inconsistencies are put aside then an El Nino can be blamed for anything. The fossil carbon public relations organizations have built

the El Nino phenomenon into an over-fed "red herring" in Global Warming discussions.

The reality is that the changing cycles of El Nino events are not a cause of climate changes. They are a result of climate change. The changing patterns and intensities of El Nino events are a direct result of altering the temperatures of the surface metrological environment of the planet. The fossil fuel and petrochemical suppliers want this basic reality to remain esoteric and obscure for as long as possible.

If that is their objective then what should we expect the PR people do to image-build a disassociation between El Ninos and global temperature increases? There are a few things that come to mind, and most seem to have happened. It would be logical to encourage detailed research on the El Nino phenomenon and its widespread consequences and logical to publicly foster and insist on the importance of such studies. Then argue that more detailed research, always over extended periods, is a "responsible" necessity and demand that research funds be allocated to study "the urgent and complex problems". It's best if the general public see things as a bit too confusing and best left to the experts (unfortunately too many of whom can be bought).

Reality is not so confusing. The information is there. As far back as 1895 Svante August Arrhenius accurately calculated world temperatures rises resulting from increases in atmospheric carbon dioxide levels. We have also known and become familiar with El Nino events for almost as long as fishermen have been catching anchovies off Peru. We have known for a long time the general mechanism of an El Nino event and how it's related to, and dependent on, the water temperatures in the tropical Western Pacific Ocean. Global Warming is heating this water and El Ninos are changing.

The first time I really noticed this dissociation of Global Warming from El Nino effects was in an editorial in *New Scientist* in September 1992. The article was captioned "Drought hits Brazil as climate chaos spreads". It described forecasts of disasters predicted by the Meteorological Office in the United Kingdom. The article first explained that El Ninos are changes in wind and ocean currents across the Pacific. It described how El Ninos seem to affect weather patterns from South Africa through Australia to South America and even up into the Great Plains of the United States. It then went on to report consequences. It reported on grain crops destroyed in Zambia and Zimbabwe, on millions of sheep dying in the resulting Australian droughts, how the parched rainforest of Indonesia got devastated by raging forest fires. It reported on horrendous flooding in Peru and how drought ravaged the Rio Grande do Norte in Brazil.

Yet nowhere in this succinct and detailed chronology of Earth spanning disasters is Global Warming, or rising world temperatures, or even atmospheric carbon dioxide levels, given a single mention. This may have been just an oversight, but the implication, or at least the impressions one would receive was that El Ninos are a powerful event and an event unto themselves and unrelated to concepts of Global Warming. One might wonder was the non-mention of carbon dioxide build-up and Global Warming a coincidental omission that just happened to suit the public relations strategies of the fossil carbon industries?

From reading articles and editorials in all manner of publications it is easy to get an unnerving impression that the separation of destabilized climatic events from global temperature rise, is a deliberate and cynically manipulated bias in media editorial. A bias created to sell fossil fuels and petrochemicals and to keep managers in advertising departments and their clients happy. This type of manipulation creates editorial bias that we must be constantly prepared for and to recognize.

STRATEGY 10

IN THE MEDIA, DROUGHTS AND FLOODS SHOULD NEVER BE REPORTED AS BEING RELATED TO GLOBAL WARMING

Floods, droughts, hurricanes and all the

disasters related to these phenomena are immensely newsworthy. They receive enormous publicity and no amount of influence can suppress the stories. However, for the oil lobby it's necessary, and not too difficult to suppress the otherwise inevitable speculation on their relationship to atmospheric change.

The petrochemical-fossil fuel industries have enormous influence on the media, so it is not too difficult to have the media advertising people lean on the media editorial people to have just a few little things omitted or adjusted.

This is where the advertising dollar can push an editor to subtly change the emphasis in a story and muddy the connection between Global Warming and so-called "natural disasters".

Of course to justify the omission of facts from a story, it can always be pointed out to the editors that any relationship is "still hypothetical". The oil lobby would naturally insist that it is "only speculation" that a newsworthy natural disaster is the result of some chemicals used in agriculture, or the result of coal used to fire some power stations remote from the disaster.

If such speculation is avoided then the advertising manager's very powerful client will be most appreciative. The general public, it seems must never be allowed to drift towards believing that urgency exists for genuine and practical solutions to Global Warming.

How many times, when a weather related disaster is reported, has Global Warming and spiralling atmospheric carbon dioxide levels been mentioned in the copy, let alone the headline? Almost never! Watch for this ploy when you read about natural weather related disasters. Examples of this selective reporting practice in the various media are everywhere.

You might have noticed that up to recently, floods, storms, droughts and other weather related disasters were often described as the worst, the biggest, or the longest ever recorded. This is no longer the case. Saying something is the biggest ever, confirms the weather is changing and the PR people don't want that message to come across. Comparisons are now only made from history when history records a similarly sized event. The message then becomes: it's all happened before, nothing is new. When events surpass all previous historical levels, this is now, most notably, no longer noted. The event is simply described by size but no longer by comparison.

The oil and petrochemical industries' influence goes right to the top. One incident: the previous United States Vice President Al Gore, in his book *Earth in the Balance*, reports how Ed Rogers, (senior assistant to John Sununu, who at the time was US Presidential Chief of Staff) contacted a TV network, reporting on the seriousness of Global Warming, and "helped persuade" them to "downplay its significance". Apparently it was part of Rogers' job to cajole "news organizations to down-play the global warming issue", – Al Gore's words.

It has now become standard practice for oil industry public relations. It will stay standard practice for them until we all becomes conscious and aware of the manipulation behind this form of reporting.

STRATEGY 11

PROMOTING GLOBAL WARMING AS BENEFICIAL AND CLAIMING EXCESS CARBON DIOXIDE WILL STIMULATE PLANT GROWTH

When sunlight is present, vegetation breathes in carbon dioxide and, with the aid of the chlorophyll molecule, breathes out oxygen. The carbon is converted into plant matter. The concept being promoted by the PR organizations is that increasing carbon dioxide levels in the atmosphere will stimulate plant growth and therefore reduce the rate of carbon dioxide build-up. The implication being that CO_2 build up will be self-correcting. Television advertisements in the US funded by the beautifully named "Committee for a Greener Earth" have extolled the supposed virtues of an atmosphere containing CO_2 levels of 540 ppm (parts per million). Remember that pre-industrial levels, prior to World War II were 280 ppm.

We have already increased the CO_2 levels in the atmosphere by 30% to 365 ppm and so creating excess planetary heating and ever-increasing climatic instability. If our excess atmospheric CO_2 could significantly increase the volume or mass of the world's plants, then logically it would already be happening. It's not. The life cycle of plants is generally not particularly long, so generations of plants have already grown, reproduced and died in this current elevated CO_2 atmosphere, yet tree and plant sizes remain the same. If extra plant growth soaked up the excess we should not be registering any CO_2 build-up, and world temperatures would not be continually rising as they are.

Even if the effect was notable; it wouldn't help. Weather pattern changes are turning the rain off in too many of the world's forests and turning the forests into carbon dioxide belching firetraps.

Unfortunately increasing carbon dioxide levels will not somehow self correct Global Warming. They won't even slow the heating. The concept is invalid. But for the fossil fuel companies that doesn't matter. Who cares about facts? For them it is only what people believe that is important. The fossil carbon-based industries therefore have to ensure that any statement, by anybody, anywhere, that implies these concepts could be significant, must get widespread media coverage. A sense of confusion must be fostered in communities to cloud and confuse the issues. Doubt must be created. Complacency must be fostered.

If it could be established even to some minute degree that higher levels of carbon dioxide could act as a fertilizer and stimulate extra plant growth, then deep concern on Global Warming by thinking people might be significantly averted or delayed. For the fossil carbon industries a Global Warming self-correcting image with a widespread belief would be ideal. People's concerns would be delayed for another decade or so.

All the oil and coal producers need is to prove the stimulating effect does exist. Then headlines can be made to read "Greenhouse Gasses Could Solve World Food Shortage" or some such similar fiction.

Exaggerated and colourful newspaper stories can do the rest.

Typical: a headline in a widely read and respected periodical stated that one Soviet climatologist predicted a "Global Paradise" resulting from Greenhouse Warming (*New Scientist*, Vol. 123 No. 1679). If the reader is not overly interested, then only the headline is seen. In this article, the fine copy right at the end did add that virtually all Western climatologists disputed his claim.

Mikhail Budyko, the Russian climatologist named, proclaimed that the weather would be warmer and more pleasant in Siberia. Greenhouse Warming should therefore be appreciated and stimulated. Budyko also disputed the general prediction that rainfall in the centre of continents would decrease. He also argued that even if it did decline in the continents the rainfall would re-establish itself in no more than "sixty or seventy years". Yet sixty or seventy hour forecasts from most weather forecasters are still not particularly reliable!

The grain growers of the vast northeastern Australian state of Queensland, after almost a decade of crippling droughts in the 1990s and the early 2000s, would not be very happy with Mr.Budyko's predictions. By the latter half of the 1990s, drought conditions had affected the entire Australian continent. This had never happened since records began. (I was very aware of the farming communities' hardships. My wife Chris, set up an

The author's wife, Chris, at the park named in her honour by the City of the Gold Coast, in company with grandchildren Keturah and Rhiannon. We must not have our grandchildren inherit a world in climatic chaos.

organization she named "Save the Farm Fund of Queensland". Her fund collected and distributed over $14,000,000 worth of food and clothing and other essential items to over 20,000 farms throughout the Queensland and New South Wales drought areas. Chris was named Queenslander of The Year for 1996 and was awarded an Order of Australia Medal for her work. A park in Gold Coast City has been named the "Chris Yeomans Park").

At the 28th National Geological Congress in Washington DC, Bill Fyfe of the University of Western Ontario, rightly disputed an argument that says with Greenhouse Warming we will simply grow our grain in new "Bread Basket Areas"; Bread Baskets that supposedly would simply be further from the equator and therefore cooler. He maintains that the infertile and undeveloped soils of these higher latitudes could not support the prodigious yields of the existing prairie and savanna lands of the world. Agriculture, he maintains, simply cannot re-establish itself that quickly.

Even if the soils were developed cheaply and rapidly, the immense infrastructure required to support new grain producing locations would be expensive and slow to establish. And to compound the problem, would those new locations themselves be permanent? Would yet another move be required in another decade or so?

Quite a number of tests have now been conducted to determine if high levels of atmospheric carbon dioxide will stimulate specific plant growth, and indeed the effect has been detected. High CO_2 levels can stimulate some plant varieties. However in order to see the effects, carbon dioxide levels much higher than exist, or could exist in the real world, are utilized.

Higher levels of carbon dioxide than humans can breathe are often used in controlled laboratory atmospheres. Some plants exhibit slightly accelerated growth in these high carbon dioxide atmospheres. The effect, although slight, appears somewhat similar to that produced by nitrogen based chemical fertilizers. The similarity being, that while the weight and bulk of the plant can show a detectable increase, the nutrient levels do not.

The claimed beneficial effects of high carbon dioxide levels are also doubted by Fakhri Bazzaz of Harvard University in the US, as reported in *New Scientist* 2 June 1990. He considers that species could vary dramatically in their response. Unfortunately for agriculture, Bazzaz's own results indicate that plants such as sugar cane and corn are not improved, but weeds are stimulated.

Other results vary slightly. Christian Korner and John A. Arnone, both of the Department of Botany, University of Basel, Switzerland also set out to test these hypotheses. They constructed a humid tropical ecosystem typical of 40% of the Earth's biomass locations. The control rooms had CO_2 levels maintained at Earth's then current elevated level of 340 ppm. In the test room CO_2 levels were almost doubled to 610 ppm. A detailed report and analysis of these experiments in fact showed a surprising lack of response to the elevated CO_2 levels. Their conclusion: Global Warming will not self-correct, nor will it produce any significant or meaningful enhanced plant growth.

Apart from the above, the lowest carbon dioxide level used in any of these types of tests, that I am aware of, was 500 ppm. That's almost double the pre-industrial levels of 280 ppm.

To summarize: the growth stimulating effect on some plant species in atmospheres with artificially high carbon dioxide levels has been definitely detected. Also, after considering the test results we can say with absolute certainty that it will have negligible effects on reducing, or even slowing Global Warming.

The oil companies' public relations people would like a different image to be accepted. They need confusion to be created and in consequence we are force-fed false and misleading statements about the growth benefits of elevated atmospheric levels of carbon dioxide.

The way we are being directed and brainwashed needs to become obvious to every thinking person. It becomes very apparent that thoughtful and

responsible action by all of us, as individuals and collectively, is the only true defence against world climatic disaster.

STRATEGY 12

SUGGESTING FOSSIL FUELS ARE ONLY A MINOR CONTRIBUTOR TO GLOBAL WARMING

The fossil carbon companies and the oil rich nations must always imply or suggest that the major causes of Global Warming are not the result of burning fossil fuels. This is not an easy task, but they have to keep saying it. So they blame burning or clearing of remote tropical rainforests. They blame methane produced in Asian rice fields, they blame methane released in the flatulence of farmed livestock, they blame land clearing and blame sunspots. They blame the unpredictable and uncontrollable discharges of carbon dioxide from volcanic eruptions. Everything is loudly touted as being at least a "highly significant factor" in Global Warming. They blame anything that can take the heat off the simple fact that fossil carbon fuels and petrochemical products are by far the prime cause of our current Global Warming and its cancerous climatic change.

Most of the volcanoes in the world are actually in the oceans. They occur between continental masses in places like the Mid-Atlantic Ridge that runs north-south up the centre of the Atlantic oceans. The fossil carbon lobbies' advertising and public relations people have not yet (at this time of writing) discovered these under-sea volcanoes. But rest assured, very soon they will, and then promote them as a "very significant source" of carbon dioxide.

How often do you see stories in your local media about "pristine" rainforests being destroyed by supposedly new "slash and burn" agricultural concepts? One wonders what advertising agency dreamed up that beautifully emotive description of an agricultural practice that has been totally sustainable for several thousand years. Un-numbered examples of jungle land clearing by burning, subsequent farming for various periods and subsequent regrowth of the jungle, can be seen in places as far apart as the Amazon Basin in South America and Borneo in South-East Asia.

Methane is a powerful greenhouse gas and the fossil fuel industry ensures that all non-petroleum sources receive excessive blame. Flatulence from cattle receives a ridiculous amount of attention, but did the herds of bison that roamed the American west have better table manners or maybe a different digestive system than modern cows? They had neither. New Zealand recently tried to imposed a "flatulence tax" on livestock to demonstrate the government's "seriousness" in combating Global Warming! New Zealand's leaders have taken virtually no other steps to control CO_2 emissions whatever, other than signing the hamstrung and meaningless Kyoto Protocol.

The media and the green advocates blame rice fields for producing methane. Yet swamps (that we must now call "wetlands" so they have a more acceptable image) are constantly producing enormous quantities of methane from rotting, oxygen starved vegetation. The wet tropical rainforest of the world produce and discharge into the atmosphere an estimated 55,000,000 tons of methane gas per year. Methane gas from rice fields is tiny by comparison.

All these stories and claims are designed to instill a widespread feeling that Global Warming just cannot be stopped. It cannot be stopped by the efforts of nations, and definitely not by the efforts of individuals. If the public relations people can have us resigned to a belief that Global Warming is inevitable, they have won. People will then relegate Global Warming and endless and erratic climatic changes into some "too hard basket".

STRATEGY 13

CLAIM ELECTRIC CARS RESULT IN MORE CARBON DIOXIDE FROM THE EXTRA POWER STATIONS

For individual mobile transport, modifying

them to operate on biofuels is the easiest and quickest conversion possible to cut greenhouse gas production. The other option is to build electrically powered vehicles and carry the stored electricity in some form of battery. The essential proviso is that the batteries must be charged from power that is not generated at fossil fuel burning power stations. .

Electrically driven motor vehicles in particular have all the advantages and none of the disadvantages of petrol and diesel systems. Their problem is how to store the electrical energy needed to run them. There is as yet no practical answer to this problem and when, and if it is solved there is absolutely no distribution system in place, or close to being in place to fill up when a vehicle gets low on this "fuel". Such a system can't even be thought of until a viable battery, or a battery equivalent has been invented. These are probably the only real downsides. But they are extreme hurdles and not easy to overcome.

Electric powered vehicles produce no pollution of any kind – just none. And if it's wanted, they can be made to beat almost any car off at the lights. The General Motors' electrically powered "Impact" sport car is mentioned further on. Electric motor vehicles present a difficult public relations problem for the oil companies, and oil people don't like to give in. Downsides just have to be invented and promoted.

CLAIM ELECTRIC CARS PRODUCE GREENHOUSE GASSES

This is the major "downside" peddled.

Electric cars run on electricity. The electricity has first to be generated. The electricity is then sent down the wire from the power station, fed into the car and stored in some sort of battery. Coal is the traditional power source for large central power stations. Neglecting minor pollutants, coal is almost pure carbon. Petrol on the other hand contains carbon atoms and hydrogen atoms. Burning coal produces carbon dioxide. Burning petrol produces a mix of burnt carbon as CO_2 (and some CO-carbon monoxide) and burnt hydrogen as H_2O. So in terms of released energy, petrol produces less carbon dioxide. The argument therefore states: it is better to burn petrol in the car than coal at the power station.

Another part of the argument is that sending the electricity down the power lines and storing it in batteries is not 100% efficient. Therefore we need to produce more power at the power station to cover this added waste. This argument always avoids mentioning the higher efficiency of the electric motor at all speeds compared to the intermittently loaded petrol or diesel engine. The internal combustion engines used in motor vehicles also produce other nasties, various nitrogen oxides, sulphur compounds and carbon monoxide. Nevertheless the claim is made that electrically powered cars in the final analysis cause more pollution than petrol driven cars. This marketing ploy studiously avoids the reality that power stations don't necessarily have to run on coal or other fossil fuels.

To prevent the possible general adoption of the electric motor vehicle, the oil lobby group's obvious ploy has to be, "stop hydroelectricity, stop wave energy, stop wind, stop solar and tidal power generation, and especially stop nuclear energy". Their unavoidable and perfectly natural plan is that petrol, diesel, and natural gas must remain the inevitable choice for transport.

CLAIM ELECTRIC CARS SIMPLY MOVE POLLUTION OUT OF TOWN

By ignoring non-fossil fuel power stations and assuming the power comes from coal, the argument is made that the site of production of the greenhouse gasses is simply moved from the car exhaust pipe to the power station smoke stack. The problem is stated as having simply been moved out of town and the problem has been relocated into somebody else's backyard. Unjustly and ignobly the pollution is swept under somebody else's carpet. Guilt and animosity can thus be fostered.

The objective in these arguments is to establish a general feeling and belief in the community that electrically powered cars cannot, and will not solve the problem, not now and not ever. An image can

then be fostered that advocates and promoters of electric vehicles are undoubtedly fools and false prophets.

In the eyes of the oil lobby's image-makers, the general public can be so conditioned that they accept the totally false premise that electrically powered vehicles are an irresponsible answer. They can be conditioned to "know" that the adoption of these electric powered vehicles, simply and selfishly, forces the pollution problem onto somebody else's shoulders.

But the arguments are wrong. Electric powered motor vehicles will help reverse global overheating. If all our vehicles suddenly and miraculously became electric, then all we would need is a lot more power stations to provide the electricity. We just have to make sure these new power stations don't run on fossil fuels. If it means we have to pay a couple of cents a kilowatt-hour more for our power it would most certainly be worth it.

Electric vehicles are practical and versatile. They are out there in the market place and being used now. The General Motors "Impact" is one at the high-powered top end of the market. Most are smaller, more compact and designed for urban use. Wherever and whenever we can, we have to support their development and use, for eventually power for them will come from non fossil fuel sources.

The relative importance of various energy systems and the most practical of the alternate transport fuels is covered in Chapter 11: **ENERGY SYSTEMS WE USE NOW AND WHAT WE MUST USE TOMORROW.**

STRATEGY 14

SMEARING THE IMAGE OF ELECTRIC POWER IN MOTOR VEHICLES

Sometimes the articles published in science journals could be considered laughable if they were not so frighteningly insidious. This is one they didn't get away with. It asks, "What's wrong with electric cars?" and then supplies some strange answers. This is what happened.

We have three professors from the Carnegie Mellon University of Pittsburgh, Pennsylvania: a professor of economics, a professor of engineering and a professor of environmental engineering. In a combined authoritative article, they explain their version of the truth about electric cars. It was entitled "Environmental Implications of Electric Cars" and was published in *Science*, Vol. 268.

In a broad claim, the article makes wide criticisms. It argues that electric cars may produce no pollution at their point of use but everywhere else they do. It states categorically that the power generation required in the first place must come from a remote fossil fuel run power station and therefore "electric cars are a means of switching the location of environmental discharges". As always, it is blithely presumed in the article that all power stations burn, and always will burn fossil carbon as their energy source. Again, nuclear energy, solar, hydro, wave, geothermal and wind energy are presumed not even to exist. It then states that, "The environmental effects of internal combustion engines are well known", and therefore, it seems we are to presume, perfectly acceptable. It goes on with an unusual claim that "Pollution controls (on motor vehicles) have lowered emissions by 98%" compared to a "control car". That statement is standard statistical gobbledegook. Carbon dioxide is simply not considered as an atmospheric pollutant in such statements. They seem to be minimizing the description of pollutants down to sulphur compounds, nitrogen compounds, and maybe soot.

The main thrust of this report however, is to establish that the lead in the batteries of the electric vehicles will somehow get into the atmosphere. By using a series of somewhat unusual presumptions, they managed to conclude, "an electric car using batteries with newly mined lead releases sixty times the peak fraction released by combustion of leaded gasoline". However, this supposedly authoritative report does generously state that if "recycled lead, and 'technology goal' batteries are used, only five times as much lead would be released into the atmosphere".

Technology goal, meaning that the ultimately ideal design for batteries is still apparently a lead battery.

They finally conclude, and expect people to believe that "Electric vehicles will not be in the public interest until they pose no greater threat to public health and the environment than do alternative technologies, such as vehicles using low-emissions gasoline."

The report was published in *Science*, the journal of American Association for the Advancement of Science. There would have been a lot of people that just read that one issue of *Science* or just the article, and not have seen the deluge of follow-up letters denouncing these irrational oil biased claims.

The report received serious criticism in the subsequent issue of the United Kingdom publication *New Scientist*. It headed its article, "Fears over lead from electric cars unfounded". The *New Scientist* article cited criticisms of the Carnegie Mellon University report from innumerable sources. It stated that both industrial and environmental groups were vociferous in their claims that the report contains "grave flaws". The "researchers have used unrealistic assumptions", *New Scientist* maintained. John Rodman of the Massachusetts Executive Office of Environmental Affairs stated that, "The benefits of reducing pollution from traffic in cities (by using electric vehicles) will far exceed the risks of small increases in lead releases".

Michael Weinstein of ElectroSource from Austin, Texas, a producer of advanced lead acid batteries, was probably totally correct when he complained of "misleading scare tactics" in the Carnegie Mellon study.

Critics also complained that the Carnegie Mellon's claim that one and one-third tons of batteries were needed to run a Zero Emission Vehicle (ZEV) was a "serious over estimate". At that time General Motors had already produced their electric sports car, the Impact for trial runs. This car contained 522 kilos (1,150 lbs) of batteries and demonstrated a very zippy performance even on its conventional lead-acid batteries. The Carnegie Mellon team, for good measure, also let it be known that they were "skeptical" of the General Motors endurance figures for the Impact.

Incidentally, two US power supply companies in Los Angeles conducted a survey on seventy-nine drivers that were each given Impacts to use for four-week trial periods. All the drivers were pleased with their vehicles and were impressed with the "Impact's quietness and smooth acceleration". Their major complaint was that re-charging could only be done at their homes. To solve this problem, Californian power companies are now installing recharging stations in car parks and shopping centres around Los Angeles to cater for the expected expanding demand.

The Carnegie Mellon report received a wave of ridicule and criticism from competent scientists all over the US. Finally, four months later in August 1995, *Science* finally printed a few letters criticizing the report. It admitted that the journal had received "an unusual number of letters" and that "most criticized the thesis that electric cars would be more polluting than leaded petrol". Comments included in the letters received by *Science* included words and statements like "absurd", "misleading" and "the analysis does not appropriately support its conclusions". Other statements included "These amazing conclusions result from errors of fact and incorrect assumptions regarding current and future EVs (electrical vehicles)". Other comments on the Carnegie Mellon studies included "the conclusions are over statements based on obsolete data and extremely pessimistic technology assumptions".

Some letters pointed out that lead-acid batteries are already in every car on every road in the United States, about 100 million of them. Other letters also suggested that undoubtedly superior batteries will come on line much faster as a result of the development of electric vehicles.

The published letters most definitely were not from irresponsible and ill-informed people and there were too many to suggest that the criticism was an orchestrated public relations exercise. Letters questioning facets and conclusions of the Carnegie Mellon study came from such people

as Roland J. Hwang of the Union of Concerned Scientists, Berkeley. California, Gary Rubenstein and Thomas C. Austin of Sierra Research, Sacramento, California. Linda Gaines and Michael Wang of the Energy System Division, Argonne National Laboratories, Argonne, Illinois, Clark W. Gellings and Stephen C. Peck of Electric Power Research, Palo Alto, California, and David Allen of Department of Chemical Engineering, University of California, Los Angeles. The editors of *Science* received so many letters that they ultimately had to cap off the criticism.

It was certainly refreshing to see so many responsible people speaking out. Still one has to wonder how many times the original Carnegie Mellon report has been used by the oil lobby, and quoted as "published scientific facts", (that is outside of scientific circles).

THE INVENTED DANGERS OF EMF, A GIANT CONFIDENCE TRICK

Electric vehicles are being linked in an incredibly sinister and irresponsible manner to cancer. This totally hypothetical link relies on some very nebulous and dubious "scientific studies". You be the judge.

Epidemiologists study epidemics and the occurrence and distribution of diseases in populations. In 1979 two epidemiologists, Nancy Wertheimer and Ed Leeper, of the University of Colorado Health Center in Denver, published a study suggesting a statistical link between the occurrence of leukaemia in children and their exposure to EMF or electromagnetic fields, (confusingly, EMF is also used as an abbreviation for electromagnetic force). An unbelievable series of media reports and claims followed the publication of their paper in a science journal. This was unusual as such research papers on uninteresting statistical analysis rarely receive so much coverage.

An electromagnetic field, an EMF is created around a wire when an electric current moves along it. You learn this in school physics. Every wire in your house, when carrying an electric current, produces a small electromagnetic field. Electric currents even flow in our own bodies and we produce our own EMFs. An electrocardiogram simply measures the EMF generated by the heart muscle as it beats. The strength of the EMF depends on the strength of the current in the wire, but more importantly on the distance from the wire carrying the current; it drops very rapidly as the distance away from the wire increases. It's the same reason why radio signals quickly become weaker as the receiver moves further away from the transmitter.

It should be pointed out that, totally unrelated to the EMF health debate, small quantities of ozone are sometimes generated around high-tension power cables. Very high levels of ozone are always produced during electrical storms. Ozone generators are actually used in hospitals to refresh the air as ozone is known to be beneficial at certain levels. In the case of power lines, and because the quantities are so small, it is virtually impossible to predict whether the ozone produced is a theoretical health benefit or a theoretical health hazard. So it wasn't an ozone issue.

Following Wertheimer's and Leeper's paper there was an incredible explosion in research to determine whether their nebulous link between exposure to EMF and childhood leukaemia really did exist. And if it existed, was it in any way meaningful? Could it be a significant health hazard? Was it simply a phenomenon of purely academic importance? Or was it imagined? Subsequent researches claimed they detected a statistical link. Others said their statistics proved that no links existed.

Other researchers claimed they detected beneficial effects. Some noted enhanced bone healing and bone regeneration after exposure to much higher levels of EMFs. Bone breaks were healing quicker. Other research suggested a statistical reduction in the occurrence of cancer in people exposed to high level EMF radiation.

The media seemed to have had a field day, but the reporting indicated a widespread and systematic bias. Virtually every caption, in every headline, in every media report, highlighted the dangers. Rarely, if ever, were beneficial effects

mentioned. Nor were we informed that a lot of the studies failed to find any link whatsoever. Despite the media headlines, absolutely no evidence was found to warrant concern for low-level electromagnetic fields. The research was extensive. In 1990, the Committee on Interagency Radiation Research and Policy Coordination, part of the White House Office of Science and Technology Policy, published a report concluding, "there is no convincing evidence in the published literature to support the contention that exposures to extremely low frequency electric and magnetic fields generated by sources such as household appliances, video display terminals, and local power lines are demonstrable health hazards".

Nevertheless, the fears that power lines were a health hazard continued to be promoted.

Then in 1992, a researcher, Robert P. Liburdy, published two papers that considered a mechanism for a possible link between electromagnetic field exposure and cancer – a connection that additionally would link EMF exposure to a host of other diseases. His research indicated EMFs increased the flow of calcium into lymphocytes. This increase in calcium flow could then conceivably lead to cancer because of the interrelation between calcium and cell division. Thus the plot thickened. A supposedly plausible, and very easily marketable link was thus finally established.

But who was Liburdy? Seven years later, in June 1999, the United States watchdog on scientific honesty, the US Federal Office of Research Integrity, stated that Robert P. Liburdy, had "engaged in scientific misconduct by intentionally falsifying and fabricating data and claims". Relating to the EMF-cancer link, Liburby had also "deliberately created artificial data where no such data existed". Before these findings, between 1992 and 1999, Liburdy had received federal research grants totalling almost US$6 million! The Office of Research Funding's findings were reported in both the October 1999 issue of *Scientific American* and the 2 July 1999 issue of *Science*.

But that was in 1999. In 1992, the United States National Institute of Environmental Health Sciences spent US$66 million on a study concluding that the "possible" dangers of EMF radiation were "based on limited evidence". In 1995, the British National Radiological Protection Board's Advisory Group on Non-ionizing Radiation, after a comprehensive review, reported that there was no persuasive biological evidence to link normal every day EMF levels with the incidence of cancer of any form. In 1996, the United States National Research Council concluded yet another exhaustive three-year study on whether EMFs from power lines or household appliances posed a threat to human health. Their sixteen-member panel stated that there is "no conclusive and consistent evidence" that EMFs, at anything except possibly extreme levels, pose any threat to human health.

A large-scale study on EMF was completed in July 1997. A team of epidemiologists led by Martha Linet of the US National Cancer Institute and Leslie Robison of the University of Minnesota, Minneapolis completed what *Science* described as the most carefully controlled study yet. This was a five-year, US$5 million study on the possible link between EMFs and childhood leukaemia. "The results are very clear," Robison summarized at the conclusion of the study, "They're negative." There is no link.

Edward Champion, the deputy editor of *The New England Journal of Medicine*, on reviewing the 1997 study, suggested it was time to "stop wasting our research resources" on the EMF/cancer hypothesis. After spending almost US$100 million at a variety of universities and research establishments, that summation is now near everybody's opinion.

Who is it, or what organizations are they that constantly fuel this hypothetical threat that EMFs cause cancer? And why do they do it? It would seem that if any risk factor did exist, the risk is obviously so low that avoiding it is vastly more life threatening than living with it. Imagine eliminating electricity from our households, no electric lights, no refrigerators.

How many people would die in fires caused by accidents with candles and kerosene lanterns, or suffer food poisoning from poorly kept food? So again, who benefits from constantly rejuvenating an esoteric debate about a nonexistent medical phenomenon?

In October 1995, Peter Wright of Cambridge UK wrote a "letter to the editor" of *New Scientist*. Wright pointed out in his letter some interesting concepts. California, along with twelve other US states were introducing legislation to enforce the introduction of ZEVs (Zero Emission Vehicles). The legislators were endeavouring to have 10% of the registered vehicles in each of their states as zero emission vehicles by 2003. (It never actually happened.)

Wright reminded us that ZEVs run on electricity. The ongoing controversy over the apparent danger of EMFs in the US appeared to be leading to the imposition of a federally enforced "safety limit" for human exposure to EMFs. A "tesla" is a measure of magnetic field strength. A proposed limit of 0.2 microteslas had been suggested. This is an exceedingly small amount. That law would then have automatically made Zero Emission Vehicles totally illegal in the United States of America, and if this were the case then no other country would ever have bothered producing them. The electric motor vehicle would have been finished. Incidentally the law would have also made it illegal to operate every vacuum cleaner ever made, along with almost every other electric appliance used in the home. That's what would have resulted had these irresponsible and idiotic "safety measures" been adopted.

The significant result would have been the creation of a US Federal law effectively mandating that all vehicles in the US would be built to run on gasoline or diesel.

In the media the EMF argument still goes on. Despite all the research to the contrary, the media have kept hammering the supposed dangers of electromagnetic fields. What has been the effects of this long drawn out, extravagant, and wasteful debate? Although it is not necessarily wasteful to the objectives of the oil companies. Much of the development of ZEVs must have gone on hold "awaiting developments". In 1993, over 40% of the American population were convinced that exposure to EMFs from power lines was a serious health hazard. Four years after in 1997, a survey by The Edison Electric Institute showed that 33% of Americans still viewed EMFs as a serious health threat.

And what was the price paid? *Scientific American* reported on what appeared to be the only factual survey conducted on the cost to the US economy of the EMF scare campaign. The estimate was around one billion US dollars. The costs were mainly attributed to massive modifications and re-routing of new power lines. This incredible waste is now ongoing. The lies, the stupidity and the waste have spread across the world. We are all paying for this incredible mass of scare mongering.

The one really bright side to it all is that in the end and to their credit, the United States Federal Government did not make Zero Emission Vehicles illegal. This time the oil companies didn't win, it's just that everybody else lost.

STRATEGY 15

CLAIMING REMOVING LEAD FROM PETROL MAKES IT SAFE TO BURN.

The chemicals, tetra-ethyl lead and tetra-methyl lead, when added to petrol, greatly increases its octane rating. See, **CFCs AND THE STORY OF A BRILLIANT CHEMIST** in Chapter 4. The octane rating of a fuel is a measure of its anti-knocking properties. Knocking occurs when fuel-air mixtures pre-ignite from compression heating in the engine cylinder. The resulting overly rapid ignition produces a sharp rise in pressure that produces the "knock".

Older vehicles produced before about 1970 had engines with relatively high compression ratios, often around 10:1, and knocking was a problem unless tetra-ethyl lead was added to the fuel. Modern petrol engines typically use lower

compression ratios around 8:1. The compression ratio is the ratio of the volume of the air in the cylinder when the piston is at the bottom, divided by the volume when it is at the top.

Less nitrous oxides are produced in petrol engines with lower compression ratios. Higher compression ratio engines are in general more efficient, but many factors influence overall efficiency. Today, well-designed modern engines are often more efficient, despite their reduced compression ratios, than the older higher compression ratio engines.

The amount of lead added to some fuel categories has been kept high to cater for older vehicles, and also for a few "high performance" engines produced by companies like Ferrari.

When burning so-called "leaded" petrol, that is petrol containing tetra-ethyl lead in an engine, the exhaust gasses do contain small quantities of metallic lead. Leaded petrol actually incorporates other additives that purposely ensure the lead is exhausted rather than deposited in the engine. With excessive contact lead accumulates in the human body and ultimately lead poisoning can occur. In ancient Rome, lead drinking vessels and dinnerware were common items on a meal table, making lead poisoning a common occurrence in those times. Entirely for health reasons, tetra-ethyl lead has been removed from most petrol grades and the petrol is less poisonous and less dangerous. Or so we are led to believe.

There are other anti-knocking compounds that can be added to petrol, Lead-replacement petrols often contain compounds like highly poisonous aniline, ($C_6H_5NH_2$) although tetra-ethyl lead is probably still the most effective of the minor additives.

It has to be understood that ethanol, which is not derived from fossil fuels, is also an excellent anti-knocking agent, but you do need more of it – up to about 25% suits well. This would be instead of half a gram of tetra-ethyl lead per litre, or a like quantity of some other additive to get the same anti-knocking effect. Brazil uses 25% ethanol blends so their cars can be built with more efficient higher compression engines.

The reduction in compression ratios that has been designed into current model cars used elsewhere has meant that tetra-ethyl lead can be eliminated from petrol, but most significantly for the oil industry, the addition of ethanol to boost petrol's octane rating is no longer a meaningful advantage.

Having sugar cane farmers or corn farmers produce 25% of the fuel for spark ignition engines in any nation will always to be strenuously resisted by oil interests. The resultant 25% decrease in oil sales if it happened would be a massive sales reduction in anybodies books.

Oil companies promote the introduction of unleaded petrol as a great environmental win for the people. Oil companies now advertise their fuel as environmentally friendly. The fact that from every kilogram of petrol used in a car almost three kilograms of carbon dioxide comes out the exhaust pipe is never mentioned. It has to be stretching the imagination to the extreme to believe petrol is in any way environmentally friendly. But we are encouraged to believe so. Beautiful images are used. Advertisements show children playing in a clean green forest. Sunlight filters through the sparkling canopy. The impression to be created in the public mind is that a great environmental breakthrough has been achieved. A caring sense of responsibility has been envisaged. Petrol or gasoline can be seen as a wonderful, environmentally safe product.

Drought, hurricane destruction, starvation, catastrophic flooding – malaria, the list goes on, are all becoming much more common because carbon dioxide build-up is destabilizing world climates. Car exhausts discharge carbon dioxide, carbon monoxide, nitrous oxides and sulphur compounds into the atmosphere, even if the lead is taken out. Removing lead from petrol has removed one toxin, but concurrently it usually decreases the engine efficiency so more petrol is used on a trip – bigger fuel sales, and more CO_2 is produced.

STRATEGY 16

PROMOTING PETROL MOTOR VEHICLES OVER DIESEL

This is on manipulating public opinion to increase the cash value of sales. With few exceptions, all motor vehicles are powered by internal combustion engines. There are two different types, one runs on petrol (gasoline), the other runs on diesel. The real difference is in how the fuel is ignited within the engine cylinder. Petrol engines use a spark to initiate combustion. Diesel engines use the heat of compression for ignition. The same heat you feel when using a hand operated bicycle air pump.

In a common four-stroke petrol engine, a mixture of air and fuel is drawn into the cylinder as the piston descends on the "intake stroke". The fuel is mixed with the air either in an external carburetor or by "injecting" the fuel into the air just before it enters the cylinder. The piston then ascends on the "compression stroke". At the end of the compression stroke the spark plug ignites the fuel-air mixture. The burning fuel produces both a lot of additional gasses and a lot of heat, which expands the gas mixture. The pressure in the cylinder increases, driving the piston down on the "power stroke". Finally, the piston ascends again on the "exhaust stroke", pushing the gasses out and into the exhaust pipe. It then descends ready to start the sequence all over again.

A four-stroke diesel engine operates in much the same manner except for the essential difference that only air is drawn into the cylinder on the intake stroke. At the top of the compression stroke, the fuel is sprayed or "injected" at very high pressure into the cylinder. As the air is rapidly compressed in the cylinder it becomes very hot; hot enough that the injected fuel ignites spontaneously. That's the compression ignition. The difference in the method of ignition has some important consequences for petrol and diesel engines, mostly related to the compression ratio. In the case of petrol engines the compression ratio cannot be too high or the heat generated during compression will be enough to prematurely ignite the fuel-air mixture; if this happens, the engine "knocks" and doesn't run efficiently. The practical limit on the compression ratio for petrol engines is about 10:1, but most engines today operate at about 8:1 as noted. Knocking is prevented by the addition of special agents to the fuel as discussed in Strategy 15.

In contrast the compression ratio in a diesel engine must be high so that the temperature produced during compression is high enough to ensure ignition of the injected fuel. Compression ratios in diesels can be as high as 22:1 but more commonly are around 18:1.

There is a popular belief that diesel engines are much more efficient than petrol engines because of their higher compression ratio. That is true, but only in part. Today's diesel and petrol engines convert fuel to useful work with almost equal efficiencies. However, diesel engines do achieve better "fuel economies" measured in miles per gallon or litres per hundred kilometres.

There are two reasons for this. The first is there is simply more energy in a gallon of diesel than there is in the same quantity of petrol – about 10% more. The second reason for a diesel engine's better fuel economy comes from the fact that, for a given size, diesel engines do not provide as high a power output as petrol engines. This is in contrast to some vehicle manufacture's advertisements that proclaim the "power" of diesel engines. But anybody who has driven the same model vehicle, powered by petrol and diesel engines of similar capacity, will tell you that the petrol engine provides much better "performance". This is one reason why turbo-chargers are popular on diesel power vehicles; they provide more power and more rapid acceleration. This of course is at the expense of fuel economy.

If there is one enemy of good fuel economy, it is high performance. The more acceleration we demand, the more fuel we use. So it's sensible marketing to sell us "performance" vehicles.

Diesel engines are universally used in heavy haulage industries for a number of reasons. The higher fuel economy is more important because

of the huge amounts of fuel being used, but also because the engines are more reliable and longer lasting.

Oil companies naturally prefer us driving high performance petrol-engined cars as we must buy more fuel. Diesel is relatively simple to produce from crude oil. Petrol production requires more effort and is therefore inherently more expensive. Petrol therefore is a "value added" product. For the same distance travelled, oil companies make more profit out of petrol than diesel. If we do select a diesel car, the oil companies love it to be turbocharged at least, so it guzzles more fuel.

It is the obvious business plan of the petroleum companies to have everybody driving petrol-powered cars.

More frightening for the oil industry is the fact that replacing diesel with renewable biodiesel is amazingly simple, only the fuel is changed. No engine modifications are required as is the case in changing a current petrol engine to run on ethanol. A few farmers are already making their own biodiesel. It can be produced from any vegetable oils, even waste oils. It's very simple and recipes are readily available. (For both ethanol and biodiesel information, see Chapter 11: **ENERGY SYSTEMS WE USE NOW AND WHAT WE MUST USE TOMORROW.**)

With the generally poor acceleration of normally aspirated diesel engines and the fact that, as they age they often produce black smoke, it is not difficult for the oil companies to steer us from diesel cars to petrol driven cars. Although the black smoke that can come from old diesels looks bad, the actual chemical mix is nowhere near as toxic as that from petrol engines. The discharge of both poisonous carbon monoxide and various nitrogen oxides in the exhaust of petrol engines is far higher than in diesel engines. Of course they both produce huge quantities of carbon dioxide, which the oil companies like us to consider as a harmless by-product.

The smoke produced by diesels gives the oil companies another angle to convince us to use petrol. Some of the very fine smoke particles are harmful. Others are not. Particles smaller than ten microns (ten millionth of a metre) are now generally referred to as PM10s. Two and a half PM10s, side by side, would be one-thousandth of an inch across. The inhalation of these particles has the most effect on the elderly, but inhalation of PM10s is harmful to all. Because the smoke is very visible, it's relatively easy to get research funding to study its effect. The report from the United Kingdom's Royal Commission on Environmental Pollution insisted that atmospheric levels of PM10s have to drop. However the end results are not as bad as it first sounds for the black smoke from diesels, including the PM10s, is solid carbon, it's soot, and so is easily washed out of the air by rain.

It may be a deliberate muddying of the waters, but it is extremely difficult to come up with death rate figures solely attributable to the poisons in petrol exhausts. The figures would certainly be many times higher than figures for PM10 deaths and just in Britain alone 10,000 people die every year from PM10 inhalation. That's Britain's estimate. An estimate for the US suggested 60,000 deaths per year from PM10s from petroleum diesel but many times more deaths from petrol engine exhaust.

Biodiesel is far safer. Biodiesel is slightly more expensive than petroleum based diesel but is totally biodegradable. It is also nontoxic and sulphur-free. The US Department of Energy reports that there is a 47.4% reduction in the quantity of particles produced by using biodiesel in trucks. They also note that total exhaust fume toxicity is reduced by between 60% and 90%. The US Environmental Protection Agency, after rigorous testing, listed biodiesel as complying with the strict legislative requirements of their EPA Clean Air Act.

Therefore, in the UK alone, switching to biodiesel would save about 7,500 lives per year. In the US possible 45,000 lives per year could be saved. Switching from petrol to diesel engines and then running them on biodiesel would save the lives of an incredible number of people.

STRATEGY 17

PROMOTE FUEL GUZZLING VEHICLES AND MOTOR SPORTS

In Western societies nearly everybody either owns a car or simply doesn't want to own a car. Selling more cars therefore does not sell more gasoline or diesel. It simply means older cars are junked quicker. So how do you sell more fuel? The only avenue is to have each individual vehicle consume more of it. Selling more fuel thus becomes a marketing problem.

Motorcar racing is exciting stuff – powerful engines – roaring exhausts – speed – danger and adrenalin. After watching a high-speed motor race it's almost impossible to get into the family car and not fantasize on having five hundred horsepower under the bonnet. Motor racing makes it easy to sell powerful cars and powerful cars consume more fuel. Big oil companies support all motor sports. And as a bonus they acquire an image of cooperative community involvement. As the supporters of these sports they become the "good guys". Remember the cigarette companies, the advertisements on every flat surface? They did the same thing, and for similar reasons.

The marketing objective for the oil companies must always be to have excessively large engines that produce enormous acceleration and incredible top speeds. It's a wonderful objective. Such engines are gas-guzzlers just idling. The promotional literature discusses acceleration. It typically considers factors such as time taken to reach 60 mph or 100 klicks. The objective is firstly to have acceleration as a common topic of conversation, but more specifically to have people who currently own low powered cars feel the need to "up grade". It suits both the carmakers – they sell more expensive cars, and the oil companies – they sell more fuel.

Actively supporting all sports that use, or rely on powerful engines is astute oil company marketing. It is wonderfully incongruous but rarely mentioned that actually most of these high performance race-cars run on methanol or ethanol. This is both to increase the efficiency of the engines and to eliminate the extreme pollution levels generated by using petrol. Levels that would almost asphyxiate the spectators, probably along with the host city. One important feature is that methanol and ethanol fires can be very easily extinguished with water. Those fuels mix and get diluted in water. Petrol and diesel don't. They just keep burning.

Both the methanol and ethanol can be made by fermentation processes. Ethanol always is. Both are therefore biofuels. This minor detail is never, never, highlighted in racecar promotional material.

Actually methanol can be produced more easily from oil, and generally is. Ethanol can't. So if a mention is made of the fuels being used and not the fuel company promoting the events, it is it is only ever of methanol. Methanol is generally the nominated fuel despite the fact that even in small doses, methanol is very poisonous, whereas humans drink ethanol. A good liqueur can contain 90% ethanol.

The other marketing ploy is simply to have cars made bigger and heavier. The end result of this concept is the two-ton, off-road, four-wheel drive, chromium tanks we now use to drive the kids to school. The automobile companies are very much on-side with big cars as the bigger margins are always in the bigger models; the bigger and more powerful the better. The silly thing is that there are so many gadgets and gizmos to go wrong in the modern four-wheel off-road vehicle, that it's almost madness to take it too far off-road.

These monsters are sold for their alleged safety. The reality is that they are often prone to roll over and kill the occupants, where a car wouldn't. Also, accidents involving such vehicles are much more likely to cause injuries and death to others. In accidents involving pedestrians, for example, for every single death from impact with ordinary cars, these macho machines will cause three deaths.

In many countries road and registration taxes on these fuel hungry monsters are actually quite specifically reduced to help sales. Now that must have taken some astute and clever lobbying. If

you don't own one, recognize the marketing hype, do the sums and don't buy one. Also help prevent Global Warming by reminding current owners of their gullibility so they don't buy another one.

STRATEGY 18

PROMOTE WALKING AND CYCLING TO SAVE THE ENVIRONMENT

This is a red herring that pretends that solutions are available to prevent Global Warming but people are too irresponsible to embrace them.

Walking or cycling to work or to the shopping centre is a nice, environmentally desirable concept. But the marketing people in the oil companies are very well aware that the concept is totally impractical and will never be widely accepted. Whether we like it or not, modern cities are designed to cater for cars, trucks, buses and trams. Or else cities have been changed and modified to cater for them.

In the old centre of many expanded cities, where streets are still narrow and four-wheel vehicular traffic is difficult, or even next to impossible, for short trips the bicycle can be a big part of a transport system. Of course weather is naturally a limiting factor, as few are prepared to venture out on bicycles if rain or rain showers are a regular feature of that city's weather. Bicycles don't take on in such towns and cities. Also if a city is not relatively flat, cycling won't ever be a preferred transport option. Nor will it be if distances are anything but tiny.

In underdeveloped countries, and especially in developing countries the bicycle has become a major transport option. However this is probably because the only other option is to walk. When weather and topography allows, although slow, the bicycle is a very inexpensive means of transport. But as community wealth rises the small motorbike then become the preferred option. In developing countries it is common to see a whole family mounted up on a small motorbike. Such loading is relatively dangerous and of course would be totally illegal in a Western city. However it works for them.

Having experienced the freedom, the speed and the incredible convenience of totally personalized, individual and independent, self-contained transport, will you or the people you know, willingly go back to the bicycle; our childhood means of transport? What happens when it rains on the way home? How do you carry the shopping, and where do you put your personal laptop? Academic town planners have their lovely and impractical dreams, but observe them – they still drive their cars to their offices and universities!

The oil-marketing people aren't stupid. They support these hypothetical concepts with much fanfare. They know very well push-bikes will never be a serious threat to fossil fuel sales.

Walking is good exercise. Jogging and running are even better exercises. Riding a push-bike is good exercise. These activities undoubtedly will improve your general health; however to consider them as a viable means of modern day transport in our twenty-first century cities is totally ludicrous.

The standard of living of a society is fundamentally based on the efficiency of the members in the production of goods and services. In turn, the overall efficiency of the society is enhanced or depreciated, depending on the efficiency with which commodities and services and the people themselves are able to be transported within that society and their communities. Slow transport systems, such as walking and cycling are good systems for transporting people over very short distances. But that's all.

The expression "time is money" is a real truism. Wasting time reduces the efficiency of a community and consequently reduces that community's standard of living.

It is true that in flat country, with good road surfaces and consistently pleasant weather, cycling can be a very practical means of transport to and from a relatively close place of employment. It is also often the fastest short distance intra-city parcel and document delivery system. Unfortunately as a system for moving general goods and delivering

services, it can't work. It's also hopeless if you want to do any serious shopping, or pick up the kids from school.

Mass transport systems, such as the London Underground, are extremely practical and efficient people movers. Mass transit systems are a threat to both the oil and the automotive industry. In consequence, have you noticed how easy it seems to be to lobby successfully for funding for the construction of dedicated cycling tracks. The tracks can be in towns or cities, or parks or wherever you want. But it is almost impossible to obtain financial support for the construction of mass transport systems. Why is this always so? Are we in doubt as to who might benefit from such difficulties and obstructions, and what industries always seem to win in the end?

It must be firmly understood that mass transport systems are an extremely dangerous threat to the petroleum fuel and automotive industries and for them their adoption is a particularly nasty scenario. Remember how General Motors, Firestone Tire and Standard Oil of California dismantled the Los Angles urban transport system. But the threat of bicycles replacing cars is not a worry. So if a transport system is not seen as any significant threat, then the oil companies must of course support it, especially if they achieve a "good image" bonus in the process. It is all just good marketing. Big oil will always promote bicycles.

STRATEGY 19

PROMOTING ENERGY CONSERVATION AS ACHIEVING THE BEST VALUE FOR MONEY

The fossil fuel marketing gurus promote energy conservation. This seems on face value to be the antithesis of what they should be arguing. But they are not fools. The argument is that if we simply cut down on the energy we use by being more responsible, we will achieve the greatest immediate reduction in carbon dioxide emissions. And this argument is totally valid. They endeavour to generate a feeling within us that if we have to, we can. We can save the world for we always have the energy conservation option up our sleeve.

By these means they instill in us a sense of complacency. Perfect. Then we will lose interest in other options and we won't have to concern ourselves with some esoteric non-fossil-carbon energy source that always seems to have some unfortunate and "well documented" downside. We can always conserve energy, they say. Sadly that's what too many people are currently believing.

A two bar electric radiator consumes two thousand watts. A sixty-watt light globe consumes sixty watts. Household air conditioners are powered by between one and three horsepower electric motors. So they use up to two thousand watts. In total, a civilized Western type society consumes, on average, between five hundred and a thousand watts of electricity per person per hour, twenty-four hours a day, seven days a week, fifty-two weeks a year. That's about equal to one horsepower per person, continuously.

With so much energy consumption it is not surprising that substantial savings should be possible by adopting energy conservation practices. Installing insulation in a house can achieve substantial heating and cooling power reductions, compared to un-insulated houses. Quite often new insulation can even pay for itself in twelve months. Better insulation in refrigerators can noticeably reduce the operating times of the power unit. Using fluorescent lighting instead of incandescent achieves significant power reductions. Turning lights off when you leave a room conserves power. Reducing the number of lights left on merely for decorative effects can achieve dramatic savings.

By adopting very simple energy conservation procedures, overall power reductions could be quite dramatic. It is technically quite easy for a household to reduce power requirements by as much as fifty percent. So a city of two million people being supplied power from coal-fired power stations by adopting sensible, practical, energy conservation practices can reduce its energy requirements to that of a city of only one million people. That two million-population city would then have reduced the carbon dioxide discharged

into the atmosphere from its power station by half. They would be reduced from twenty-four million tones to twelve million tones a year. That is quite a substantial reduction, but it won't stop Global Warming.

For the media, promoting all these conservation concepts make good and responsible stories and editorial.

This concept of reducing energy use appears on face value to be such an easy solution. The fossil fuel companies must be seen to be responsible, and so they support it. In fact the fossil fuel companies support energy conservation concepts whole-heatedly. They promote it with very visible enthusiasm. Such action seems noble and very responsible. It would appear the companies are actually advocating a reduction in consumption of the very products they sell.

But is it that simple? Could there be a subtler, a more pragmatic action plan? The real question is: are people going to change? Are we going to change ourselves? It's not easy. And no matter how many conservation concepts are promoted and even adopted, reducing our fossil fuel consumption by these methods only means at best a temporary slowing in an inevitable, ever increasing carbon dioxide build-up in the atmosphere. Expecting to save the world by the occurrence of a worldwide change in human nature is a risky bet.

The grim reality is that any promoted reduction in energy consumption on any meaningful and permanent scale has never happened. And it won't. The fact is that for the last, almost ten years, in almost every major city in the world, we have been regularly requested to stop wasting power. But we don't. Of course in exceptional circumstances, it can work for short periods. Or it could if forced upon us, but neither can be sustained and for one good reason. Few of us will put up with a lack of some totally affordable practical convenience for any prolonged period. We would demand it be fixed. We don't need to nor do we have to put up with such things.

Fossil fuel producers know how we, their customers, behave.

New Zealand has a good example. In their winter of 2003, in the face of dire warnings, low hydroelectric lake levels and an uncommonly dry season, the authorities urgently requested a 13% reduction in power consumption. The reduction was suddenly and easily achieved. Then promptly at the end of the winter excess power was suddenly available. Advertising that promoted electricity consumption was re-commenced. The irony is that one of the factors causing that original excess demand in hydroelectricity capacity during the winter was a massive sales promotion to use more power the previous summer.

Take the example of the fuel crisis of the 1970s. For a while cars were reduced in size and engine power. It didn't last long. In fact it now has all been reversed. True, cars are no longer getting bigger and that's a conservation image being pandered. But fuel consumption and fuel sales are. Maybe cars are not getting bigger but the sales promotions and the sales are now for chrome plated, four-wheel or "all wheel" drive army trucks. The public relations people working for the fossil fuel industries made it happen, and they must love their success.

If everybody turned off all the extra lights in the evening, world carbon dioxide production would be reduced. If everybody switched to very small cars with tiny engines, even greater carbon dioxide reductions could be made. If houses were insulated better, still more reductions could be made. The figures prove all these scenarios would be valid. Energy conservation is without doubt the quickest method of rapidly reducing the levels of carbon dioxide emissions. Theoretically, yes, it would all work. Practically, no, it will never happen.

Actually, there is one really significant energy conservation concept that does work, and that is solar hot water systems. Sunlight on a black pipe will raise the temperature of the circulating water to the point where it is more than ample for household use. There are surprisingly few areas around the world where solar hot water systems are impractical. To get the water significantly hotter to suit other purposes, the sunlight has to be optically concentrated which is more tricky.

It is smart, and it creates a good public image for fossil fuel power companies to support energy conservation arguments. Concurrently, for their own survival and possible expansion, it is also necessary for them to adopt pricing structures and advertising gimmicks that actually, but subtly, encourage electricity consumption. You might notice that power company advertising always manages to feature well lit rooms. It also hammers the reliability and convenience of electricity as a useful and versatile tool. Electricity is promoted very successfully as a wonderful and reliable energy source.

In Australia, despite (or perhaps because of) all the apparent efforts to promote energy efficient appliances and energy conservation, the average daily power consumption in houses has doubled over the last few decades. In all developed societies we buy more efficient appliances, but we buy more of them and use them more often. We often leave them turned on. We insulate our houses, then install power hungry air conditioners. We buy "five star" rated refrigerators which use 20% less energy, but then we keep the old one in the garage as a "bar fridge" and it usually runs continuously as the automatic cut-off no longer works.

In general for meaningful energy conservation to occur, power companies would have to support government run publicity campaigns advocating energy conservation. Of course, power companies may well see a genuine effort in this area as cutting their own collective throats.

The marketing gurus know we are only human. They wave big banners about energy conservation and how it might save the world. But with the other hand they promote the glamour of a life of high-energy consumption. The oil industries in their turn massively support images of fuel-guzzling car racing. They promote the "fun" of off-road, four-wheel drive, fuel hungry behemoths that spend their lives on our freeways and suburban streets.

Maybe we can change ourselves a little and penny pinch our energy use and of course it will help – but not much.

Saving energy is not the problem. The real problem is that most of the electricity generated throughout the world comes from power stations that burn fossil fuel. It was always coal. Now they are switching to gas, which won't change things all that much despite the massive pro-gas marketing campaign.

STRATEGY 20

FOR THE FOSSIL FUEL CONGLOMERATES, IT IS IMPERATIVE THAT EVERY THREAT TO FOSSIL CARBON AS THE PRIME SOURCE OF WORLD ENERGY MUST BE FOUGHT AND BEATEN.

The majority of the countries of the world with a high standard of living support that standard of living by burning at least five tons of fossil carbon material annually for every man, woman and child in the country. That in turn produces between ten and fifteen tons of carbon dioxide for every man, woman and child in the country. The amount of money involved in the fossil carbon industries is obviously enormous. The mining companies and the distributing companies of those fossil materials have no intention of letting those numbers drop. As other countries become more productive and increase their standard of living, they too can consume five tons per year per person.

The fossil fuel industries cannot tolerate the thought that this enormous potential market might be threatened by alternative energy. They can't let it. That's their business. Every viable, or even possibly viable alternative energy source must be fought. For all in the coal and oil and gas industries, alternative energy is the enemy.

Generally the terms "sustainable energy" and "alternative energy" are poorly defined despite their widespread use. Throughout this book, I am considering them to mean the following.

"Alternative Energy" is any energy produced by not burning fossil carbon. Fossil carbon is oil, coal, natural gas or in some countries, peat – as peat is sometimes burnt as a fuel.

"Sustainable Energy" is when the raw

material for that energy is still there even after huge quantities of the energy have been used or extracted. The energy source is still there in virtually the same quantity.

Wind, Ocean Tides, Hydroelectric, Ocean Waves, Solar, Geothermal, Biofuels, Ocean Heat Transfer, Atmospheric Heat Transfer, Nuclear, are all alternative energy systems and they are also all effectively sustainable. To the oil and gas drillers and the coal miners, they are all "the enemy". None of these alternative energy sources cause significant atmospheric pollution or add significant quantities of carbon dioxide to the atmosphere, so in consequence none of them contribute to Global Warming.

The production and use of nuclear energy does not add carbon dioxide to the atmosphere. Nuclear energy is totally sustainable. Its availability is unlimited especially when thorium reactors become available. That nuclear waste disposal is perceived as an unsolved and insurmountable problem is an example of hugely successful oil-marketing misinformation. The topic is discussed, and I think clarified, in Chapter 11, which is devoted exclusively to nuclear energy.

Basic costs of most alternative energies are currently slightly higher than those of coal, and sometimes higher than oil and natural gas. For fossil fuel companies, the alternative energy threat is countered by advertising and editorial emphasizing these often-minimal extra costs. The fossil carbon lobby claim, or imply, that marked decreases in the general standard of living will follow widespread use of alternative energy. In contrast, the reality is that the general standard of living of all people is already reduced massively by their non-adoption and non-use. The costs to the world resulting from widespread weather pattern and general climate changes far exceed any extra cost per kilowatt-hour of alternative energy supplies.

The oil and coal powers are resolute. Alternative energy sources that even vaguely threaten to be cost competitive, or any systems using alternative energy that threaten to be in any way competitive, represent a risk. And that risk must be eliminated or, at the very least, it must be effectively minimized.

Every trick in the trade is used to the full. Environmental information is "rewritten" to denigrate the whole alternative energy concept. Public awareness is manipulated to delay progress and implementation. Government agencies are systematically influenced to obstruct and harass the new concepts and hinder their development. Pressure is brought to bear on the media to produce suitably biased and (for the oil lobby) acceptable editorial. Public officers and politicians are constantly being influenced and coerced into cooperation.

An example: In Australia, in late 2003, a coalition of the Worldwide Fund for Nature, Australia (WWF) and the Insurance Australia Group (IAG) was formed with an aim to "guide public opinion and government policy" in relation to Global Warming. The association describes themselves as The Australian Climate Group (ACG). They brought together "world renown scientists and experts from health, insurance and coal industries under the banner of the ACG". (To clear some confusion: The Worldwide Fund for Nature, the WWF, was previously known as the World Wildlife Fund, also abbreviated to WWF. Obviously it was decided that a World Wide Fund for Nature is more marketable than merely a World Wildlife Fund.)

You will find the easiest way to access their information is now through the Worldwide Fund for Nature. Their first report, released in 2004, *Climate Change – Solutions For Australia*, magnanimously suggested it would be a good idea to reduce greenhouse gas emissions (not levels) by 60 per cent by 2050. That's almost half a century away!

Today, world oil reserves are still at about a 30-year level. (They seem always to be at 30-year levels.) So the Australian Climate Group, who are backed by the WWF seems to advocate that first, we continue running on oil until all the known oil reserves run dry, and then we continue to run on oil from new oil field discoveries for a further 20 years. Maybe they figure that by then there won't

be any oil left. In their plan, oil use will continue unabated, or at least until all current directors of oil companies are dead. Then it seems we could rely on coal, and we can never really run out of coal as it's there in almost unlimited quantities and it's all easily accessible.

This is their strategy on how to "guide public opinion and government policy" in relation to Global Warming, all backed by their collection of "world renown scientists and experts from health, insurance and coal industries". Is the Insurance Australia Group serious in their supposed desire to reduce Global Warming? Maybe we should also wonder: did the IAG pick the Worldwide Fund for Nature, or did the Worldwide Fund for Nature pick the Insurance Australia Group?

Oil companies may compete with each other and oil companies may compete with coal miners and natural gas producers. But, they must all co-operate to downplay the resulting carbon dioxide effects on world climate, and they must all co-operate together to prevent different and threatening players coming into "their" market.

The campaign to distort the facts and confuse the public on the hideous dangers of cigarette smoking is a great role model for the oil-coal-gas lobby. There are more women smoking now than there was when anti-smoking campaigns began. Despite compulsory bans on a whole host of advertising procedures the cigarette-marketing whiz kids have not given up. In many areas sales have turned and are now on the rise. But of course, the tobacco lobby must ensure such planning and strategic considerations never see the light of day. The fossil carbon lobby is no different.

For the fossil carbon suppliers, like the tobacco producers, it's a simple matter of business survival. To the producing countries it means national power and wealth. To the rest of us, it's the total destruction of the planet's environmental and ecological stability and the horrendous financial costs to us that results.

There are so many simple things the oil and coal people and their friends do to combat the threat of non-fossil carbon-based energy. For example: The European Commission years ago established teams of scientists to study the most cost-effective means of stabilizing carbon dioxide emissions by the year 2010 while still maintaining living standards. They concluded that people shouldn't waste power and shouldn't use so much power. If people did that then carbon dioxide emissions could be stabilized. A child could have come up with the same answer at far less cost. However stabilizing is not the answer, emissions must now start decreasing not just levelling out. What is the point of stabilizing at some arbitrary and already guaranteed climate-destabilizing level?

It was even seriously pointed out in the study reported back in the January 1992 issue of *This Week* that Sweden could phase out all its nuclear power stations and generate all its power from oil. All their citizens had to do was turn off a few more lights, and become more diligent in their use of power. To any significant extent, in any modern developed society, that is most unlikely to happen for any prolonged time span. And it didn't. Energy consumption rises with rising standards of living. With nuclear power manipulated out of the picture, where does the energy come from? The oil and gas companies win.

The same study showed that 22% of carbon dioxide emissions come from transport, but it was decided roads and road transport – not trains and rail transport – would receive the European Commission transport funding.

Also advocated was the concept of considerably more use of natural gas. Natural gas is a fossil fuel and therefore produces carbon dioxide. It just produces a bit less than coal and oil. It's the logical energy plan of the fossil carbon energy industries to eventually replace coal with natural gas.

The reports indicated that fusion energy generation could not be expected in less than fifty years and the European Commission then promptly allocated more than half of all energy research funding into this bottomless pit. Fusion energy is discussed in Chapter 11.

The Europeans are simply refusing to develop energy systems and programs that don't destroy the climate. Do they expect the developing nations

to develop the technology for them? What do the Europeans expect will happen if developing nations start pumping carbon dioxide into the air at the same per capita rate that the Europeans propose they themselves should stabilize at? The EU makes well-publicized efforts to decrease carbon dioxide emissions but it's all of little substance.

ALTERNATIVE ENERGY IS CLAIMED AS "ABOMINABLE FOR THE LANDSCAPE"

The oil tanker Braer, containing 84,000 tons of oil, hit the rocks off Garth's Ness in Scotland on 5 January 1993. All the oil ended up in the sea off the Shetland Islands. Coincidentally within days, the editorial in a prominent popular science magazine (*New Scientist*, 23 January 1993 issue) viciously lampooned and criticized alternative energy sources. That seemed like an effort to quell a public backlash against oil and fossil fuel producers that the *Braer* disaster might generate.

In describing wind power efforts in the UK, the *New Scientist* editorial reminds readers that Californians already "know" that this energy source "has an appalling aesthetic impact on the environment". The article blithely states that the wind towers in the Altamont Pass near San Francisco destroy the "natural rhythm of the hills" whereas a string of electricity pylons from British coal power stations "seem to lead the eye pleasantly across the British countryside."

It goes on to claim that the residents of Arizona and New Mexico "gripe about the damage done by solar power". It described a discontinued prototype solar energy system as "massed solar collectors mounted on rusting steel frameworks" and they are as "visually appealing as a junk yard". It even insists that the solar installation causes water erosion whenever it rains in the surrounding desert and that "helps scar the landscape further".

This type of hype is how they change our opinions without us being aware. It is time we stopped allowing ourselves to be so easily manipulated.

STRATEGY 21

TWO FICTIONS – CLEAN COAL AND CARBON DIOXIDE SEQUESTRATION

Firstly the "clean coal" sell:

A society supposedly hooked on cheap energy is like a society hooked on heroin. Promoting and marketing the fiction of clean coal is a little like promoting the concept of supplying clean needles. Clean needles might protect a user from some new infection but they don't remove the addiction problem. An addict can still die from the ill-timed injection or "overdose". In the same way, "clean" coal removes some unpleasant and visually noticeable effects but leaves the underlying problem unchanged. Clean needle advocates don't desire and plan for more heroin use. Clean coal advocates do desire and do plan for more coal use. Worldwide, coal kills more men, women and children by far then heroin ever does, and many times over. Coal-fired power stations are the most globally destructive energy system devised by man.

Coal is mainly carbon. The gasses resulting from its combustion are therefore almost pure carbon dioxide. Coal is far worse than either oil or gas. Coal exhaust is our most dangerous anthropogenic atmospheric pollutant on the planet.

If your business is selling fossil fuels, or buried carbonaceous materials of any type, it is necessary that these facts be systematically confused, and then systematically defused.

It seems incongruous but it is totally logical for oil companies to support, albeit unobtrusively, the continuing operation and the continued construction of coal-fired power stations. It is very much in their interest. It must be understood that while ever electricity comes from coal it is easily and logically argued that electric motor vehicles can have no meaningful environmental advantage over gasoline or diesel powered vehicles.

In the Carboniferous era, two hundred and fifty million years ago, enormous and prolific jungles

and swamplands sucked the carbon dioxide out of an unbreathable atmosphere and buried it in the ground as coal. The released oxygen drifted into the air and the atmosphere slowly changed.

Over millions of years the oxygen levels built up while the forest litter and the humus accumulated, sometimes to immense thicknesses. Oxygen was unavailable at these depths and in consequence coal began to form. Later geological activity covered the material, sometimes with thousands of feet of earth. The high pressure and lack of oxygen finished the coal's creation.

Power stations that burn coal totally reverse this process. We are extracting the buried coal and by using our essential life-supporting atmospheric oxygen, turning it back into carbon dioxide. We are rapidly turning our atmosphere back towards a pre-carboniferous era mix that all modern mammals would find unbreathable.

The danger in exhuming and burning ancient rainforests, for that is exactly what coal is, is a far more deadly practice than burning existing rainforests. If the high rainfall doesn't stop, then rainforests are renewable. And they renew rapidly. If you know jungles, you will know that it is virtually impossible to prevent rapid regrowth. Such forests are, for the atmosphere, carbon dioxide neutral. Whereas when we burn a ton of coal, we add three tons of carbon dioxide to the atmosphere's and biosphere's total.

Coal is not entirely pure carbon. Being fossilized vegetation it contains many of the elements in that original vegetation. In turn, the combustion products contain more than straight carbon dioxide. A certain amount of ash is always produced; very similar to the ash you clean out after a log fire.

Sulphur is always present in coal and this produces sulphur dioxide in the exhaust gasses. Sulphur dioxide is a highly toxic gas. There is always moisture in coal, which turns to steam as the coal burns and reduces the amount of heat that is obtained from the combustion. Worse, the sulphur compounds combine with the steam in the exhaust gasses and produce sulphuric acid. It falls as acid rain. Combustion isn't always complete and so black soot is often produced in embarrassing quantities. The soot, the ash, the bad smells, the corrosive acids all comes out those high exhaust stacks and mix into the air.

In comparison to the quantity of carbon dioxide in the exhaust gasses, the quantity of these pollutants is small. But you can't see carbon dioxide. You can't taste carbon dioxide. You can't smell carbon dioxide and you can't feel carbon dioxide. Carbon dioxide doesn't produce corrosive acid rain. It just controls the planet's weather. The minor pollutants however are very noticeable. Soot and ash covers everything. The thick smoke is very visible. Acid rain, now so common throughout Europe and the industrial world, comes down in every shower. The sulphur compounds often produce foul smells and everything feels dirty. But what you don't see, the effects of the carbon dioxide, is many times worse than what you do see.

If a coal-fired power station exhaust system is fitted with collectors, filters and scrubbers, these minor pollutants can be removed from the exhaust gasses. It is planned so carbon dioxide and water vapour are all that is left. The minor pollutants may be dirty, corrosive and unpleasant, but it is the enormous quantities of invisible carbon dioxide that are changing the world's climate.

UNITED STATES SUPPORTS EXPANSION OF COAL USE

Just under 60% of the electric power generated in the United States is produced by burning coal. Still today 85% of the fossil fuel reserves of the United States is coal. It has been the deliberate policy of successive US administrations to support and encourage the utilization of these reserves. That policy keeps electric power generation a CO_2 producer and thus makes electric cars a pointless exercise.

The new Bush administration's "National Energy Strategy" is structured around the increasing exploitation of all local fossil fuel reserves. Global Warming considerations are restricted to the PR agenda. The grim reality is that about 20 million tons of sulphuric acid is formed in the atmosphere in the US every year

from sulphur dioxide released by burning fossil fuels. That's about seventy litres or twenty US gallons of undiluted sulphuric acid per person per year. Coal burning is responsible for 70% of that acid. Gas and motor fuel use make up the balance. On top of that, fossil fuel burning also adds about 15 million tons of nitrogen-based acids, such as nitric acid. That's about fifty litres or another fifteen gallons each. The EU has similar figures and that's why their ancient buildings are suddenly all corroding away.

The removal of the sulphur dioxide by the use of "scrubbers" in coal-fired power stations is being made mandatory. The coal-fired power station then becomes describable as "clean". Unfortunately, the scrubbers themselves require enormous amounts of power to operate and in consequence increase the coal usage. The total carbon dioxide discharge is increases by around 4%.

The waste product from the scrubbers themselves is itself an enormous problem. One large US power plant is slowly building a waste dump of calcium sulphate from its scrubbers that, over its operating lifetime will cover a land area of eighty acres (30 ha) and will be a dump as high as an eight-storey apartment block.

This same power station needs two hundred coal-filled railroad cars every day to fuel it. In consequence it pumps 60 thousand tons of carbon dioxide into the atmosphere every day. And they try to tell us that "clean" coal is safe and clean to burn!

ALL COAL-FIRED POWER STATIONS PRODUCE RADIOACTIVE WASTE

A quarter of a billion or so years ago, radioactive materials accumulated and concentrated in the coal then being formed. The radioactivity derived from the concentration of minerals and isotopes absorbed by the giant foliage, as over eons it grew and reproduced..

Coal also contains radioactivity from another source.

Carbon is used in many industrial applications as a filter to remove impurities and poisons. It is used in gas masks. It is used as a filter on kitchen taps, and coal is nearly all carbon. Coal may look like solid black glass but it's not. Coal always contains a mass of fine hair-like fractures. A coal seam thus becomes a giant and very efficient filter. These massive filters have been entrapping all kinds of things, including heavy metals, radioactive isotopes and any number and variety of poisons and carcinogens for millions of years.

When the coal is burnt the materials are released en masse back into the environment. One result is that most coal-fired power stations actually produce similar quantities of low-level radioactive waste as is produced by an equivalent sized nuclear power station. With a coal-fired power station the heavier materials usually end up as a component of the soupy fly ash slurry. The slurry is stored in enormous tailing dams that now surround most coal-fired power stations. Not all ends up in the slurry. Some of the very fine particles, radioactive ones included, miss the filters and get into the air we breathe.

Of course these things are rarely mentioned in the media. If mentioned, the story is often confusing and convoluted. But generally such topics seem defined simply as "not newsworthy". Nobody is encouraged to complain.

COAL INDUSTRIES' "CLEAN" CLAIM STRATEGY

Jim Harrison was chairman of the Environmental Committee of the Association of Coal Producers of the European Communities. In an early article in *New Scientist* (Vol. 127, No 1732) he sought to remind us that British Coal is an industry "behaving responsibly from environmental, economic and social standpoints." He reviewed the work of the Inter-Governmental Panel on Climate Change (IPCC) and pointed out that while its members are united about "certain aspects" of Global Warming they make no "confident statements about the magnitude of any effects".

Harrison inferred that IPCC is downgrading previous high estimates on Global Warming and "perhaps reflects a current move away from past

drastic estimates". He stated that IPCC always "emphasizes their own uncertainty" on Global Warming therefore it is supposedly "poorly understood". Harrison stated the panel considered Global Warming was no more than, or at least well within, "natural climate variability". He suggested, "politicians should not launch draconian measures against greenhouse gas emissions with all the economic dislocation that could result."

Harrison advocates a "cautious approach" to Global Warming. He claims vaguely "an increasing number of scientists" especially those from the George C. Marshall Institute are "disturbed by the hype being given to the greenhouse issue." He says the "debate" (which implies Global Warming is still very debatable) will continue. He recommends "further research" to "generate a better understanding" and to obtain "improved predictions".

But of course this is the coal industry talking.

In the same article Harrison also recommends: Increasing energy efficiency in power generation and end use, increased efficiency in transport, eliminating the production and use of CFCs, ending deforestation and moving towards the use of wood products from sustainable timber resources, helping the developing Eastern European nations to achieve the efficiencies in production which have been achieved in the industrial nations. Finally, to ensure that the general public is totally placated, he infers that carbon dioxide released from coal-fired power stations is really only a temporary problem. It is a temporary problem, he tells us because "British Coal has launched an international initiative under the auspices of the International Energy Agency to research the technical, economic and environmental feasibility of removing carbon dioxide from power station flue gasses", a high sounding but totally ridiculous suggestion.

A conventional coal-fired power station, supplying the needs of a city of a million people, burns about four million tons of coal a year. To suggest that we should wait for some highly imaginative scheme that will economically remove and bottle, or somehow store the resulting twelve or more million tons of carbon dioxide seems stupidly far-fetched. And that quantity is just from just one coal-fired power station. Anybody with a basic understanding of chemistry will realize that you cannot reverse the burning reaction and turn carbon dioxide back into carbon without consuming the energy released when you burnt it in the first place. Neither can you catch the gas and compress it into bottles without consuming vast amounts of energy (and bottles). Anybody who owns an air compressor would know that. See **CARBON DIOXIDE SEQUESTRATION** later in this Strategy.

Their name "Environmental Committee of the Association of Coal Producers of the European Communities" says who they are. Generally such organizations name themselves differently. Words like "Coal Producers" are omitted and more typically names adopted would read like the "Environmental Protection Committee of the European Communities".

COAL-FIRED POWER STATIONS IN QUEENSLAND CLAIMED TO BE CLEAN

Australian coal reserves are not the biggest in the world but Australia is the biggest coal exporting country in the world. Queensland is the biggest coal exporting state in Australia. Obviously a nice clean image for coal needs to be maintained in that state. The coal trains need to keep rolling to the overseas shipping terminals. The PR machinery also has to roll. The state's recently constructed Stanwell Power Station therefore becomes a new "environmentally friendly" and "beautifully clean" power station, all to help cultivate this image.

The plant was built for the Queensland State Electricity Commission. it's located seventeen miles (28 km) west of the Australian east coast city of Rockhampton on the Great Barrier Reef. The latitude line of the Tropic of Capricorn passes through the southern suburbs of the city. The station has a capacity of 1,400 megawatts. It can therefore supply enough power to cater for an industrial city of well over one million people. (For details on power stations and their size see:

TOTAL POWER USE AND THE ELECTRICITY GRID SYSTEM in Chapter 10.)

I recently flew a light plane over the complex and over the nearby coalmines that feed the plant. For a coal-fired electricity generating facility this is as good as one could expect. It is typical of the newest and best of the "clean" coal-fired power stations around the world. The plant is located on a well-manicured 3,600-acre (1,450 ha) site. State government brochures proudly boast the environmental idealism of its construction, its filtration plants, and its locality.

The grim truth is that the power station puts 20 million tons of carbon dioxide into the air per year. That one single power station in tropical Queensland will add the equivalent of another warming blanket on five million acres (2,000,000 ha) of the Earth's surface for every year it operates. Yet they like to call such power stations "clean".

The public relations exercise when building this plant was very good. It must have been good. It must have been very convincing, for hardly a murmur was heard from the conservation movement. No wilderness organization, nor any of the proclaimed "green" groups bothered. They seemed not very interested. They either believed the "clean green" propaganda or, maybe, nobody funded them to protest.

The Queensland state government, to start off the new millennium, approved the construction of three additional and similar coal-fired power stations in the southern part of the state. The same government vigorously supported a scheme to pipe natural gas from New Guinea, across the Torres Strait (through which Captain Bligh rowed to get help after the famous "Bounty" mutiny) to the tip of northern Australia, and on down the east coast to Brisbane, the state capital. In addition the same government, in a totally nonsensical and irresponsible move, gave massive financial assistance to shore up a shale oil extraction plant further north in the state. Even Greenpeace recognizes the extreme greenhouse dangers of shale oil systems.

Why is it that alternative power systems are never considered? Central Queensland is flat, dry, sun drenched and hot. It is an enormous area considered by many to be perfect for the development of large-scale solar thermal power stations. And to make that concept even more feasible, much of the area is already connected to the national electricity grid. This ensures no possible interruption of power supply to consumers and allows excess solar generated power to be delivered back to the coastal cities. Both the Queensland Government and the Australian Federal Government financially support photovoltaic cell applications in the outback. Photovoltaic cells in no way threatens the fossil fuel industries. Solar thermal power generation might.

US FUND WASTING RESEARCH ON ANOTHER CLEAN COAL FICTION

The United States has the second largest coal reserves in the world. China has the largest. Over the last several years, the US Department of Energy has handed out US$600 million in grants to fund research to produce another system of "clean" coal power generation. That's $600 million to produce a slightly cleaner poison.

A new process being examined is called magnetohydrodynamics or MHD. The process is advocated as a much more efficient system for extracting energy from coal. To be expected, it is described as "highly efficient and environmentally clean". The concept however still involves a coal burning process producing CO_2. In the case of MHD the coal is burnt at extremely high temperatures. The hot exhaust gasses are ionized at these temperatures and in effect become a flowing electric current. It is proposed that giant magnets would surround the flowing gasses and giant superconducting electrodes would collect the current. The whole configuration hopefully becomes one massive electricity-generating machine.

The main advantage with this MHD concept is that theoretically, 15% to 20% more electricity could be produced from the burning coal. Another presumed advantage is that the sulphur in the coal, a major contributor to the formation of acid rain,

is easily removed during the process. A disadvantage however, is that as it operates at much higher temperatures it would produce larger amounts of nitrous oxides than does normal combustion. The nitrous oxides would not be visible but they would form nitric acid and thus increase acid rain. Australia, being the largest coal exporting country in the world, has its CSIRO (Commonwealth Scientific Industrial Research Organisation) also conducting research on the MHD process.

One problem to be overcome is that the superconducting circuitry to produce the magnetic fields required to make it all work need to operate at -270ºC which is very close to absolute zero. Near these magnets the operating temperatures of the burnt coal gasses in the magnetohydrodynamic process are a scorching 2,000ºC. Yet despite the ridiculous nature of this research, government funding is not lacking. (MHD is not supposed to be MAD, or Mutually Assured Destruction, but there does seem to be similarities.)

When these things are built, and that's happening now, are we expected to rejoice? Do they really expect us to feel thankful for being blessed with these new "clean" power sources? The grim reality is that a supposedly environmentally clean coal-fired power station is a marketing gimmick. The concept of benign coal-fired power stations on our overheating planet is both an actual and a theoretical impossibility. The concept is a total fallacy.

CARBON DIOXIDE SEQUESTRATION

Let's consider the concept of carbon dioxide sequestration. Many in the fossil fuel industries see the writing on the wall. They know they must do something, or be seen to be doing something about Global Warming for they have to generate a clean image to maintain their sales. The concept of carbon dioxide sequestration might be the answer.

Sequestration is taking the CO_2 from the smoke stack and burying it "somewhere", or disposing of it "somehow."

For all in the fossil fuel industries, sequestration is a wonderful and fortuitous doubled-barrelled gun. They reason that if it works then fossil fuels can be sold almost for ever, or at least into some far distant future. Fossil carbon fuels and products could be marketed and sold until the customers finally find the Earth's air suddenly unbearably unbreathable.

Secondly, if it doesn't work, sales can at least continue unabated while people await the assured "final development of the successful research". The science involved in sequestration concepts is moderately tricky and therefore easily sold to the public. It is also more easily sold to their representative politicians.

It has certainly been sold well to the current politicians in power. In countries around the world incredible amounts of taxpayer's money have been spent on "developing the research". Grants are handed out to anybody proclaiming, "a solution is near".

How is sequestration supposed to work? As explained elsewhere, there are only two remotely feasible ways of extracting carbon dioxide from the smoke stacks of power stations. One is to freeze the exhaust gasses and the other is to collect the CO_2 by having it contact CO_2 absorbing chemicals after which the CO_2 is extracted from the chemicals.

In either system, after the CO_2 is collected it has to be compressed and then somehow disposed of. Disposal after collection is a somewhat hopelessly impractical concept as we will see further on. In public relation promotions it is always blithely ignored, or simply glossed over. Air is about one-fifth oxygen and four-fifths nitrogen. So in any imagined storage system the nitrogen has to be removed or it too would have to go into the storage system.

Let's consider refrigeration. In this scenario the gas mixture has to be cooled to a temperature where the CO_2 freezes solid. It's then easy to collect. Continuously refrigerating such an enormous quantity of flue gasses is not easy, and it's an expensive process. It's also an energy demanding process. Burning still more coal is therefore a requirement. However currently nowhere is this freezing concept and the necessary extra energy required, factored in. At this time of writing vast

sums of money are being spent, and more is being allocated to be spent on the development of some futuristic and incredibly exotic coal-fired power station concept incorporating sequestration theories.

Although the concepts are utterly improbable, they are nevertheless brilliantly obtuse, and they are obviously kept obtuse for public relations and marketing reasons, and probably also for grant allocation motives.

One system being developed and promoted by Clean Energy Systems Inc. of California, and apparently under the auspices of the US Department of Energy, argues the concept that the best way to separate the CO_2 from all the atmospheric nitrogen is to remove the nitrogen from the feed air first. They argue; burn the fuel in pure oxygen. The flue gasses will then only contain carbon dioxide and probably some water vapour. The water vapour is first removed and the CO_2 can then be compressed to very high pressures again for "long-term storage or disposal". Where or how is not mentioned.

In this concept, air has to be reduced to extremely low temperatures (around –200ºC) to separate out the oxygen. This incidentally is by far the cheapest way to obtain straight oxygen and is the current method used industrially.

Pulverized coal then has to be burnt in a specially designed high temperature combustion chamber using this pure oxygen. The quantity of oxygen is carefully restricted so that complete combustion does not occur. As a result, mainly carbon monoxide (CO) is produced, not carbon dioxide (CO_2). The process is called "gasification". Often steam is added during the combustion process. The final product is then a mixture of useful hydrogen gas and useful carbon monoxide, and useless carbon dioxide. The mix is called "syngas", for synthetic gas. Typically about 20% of the energy in the coal is effectively wasted in the formation of syngas.

The syngas is then required to be burnt, again with pure oxygen, but at very high temperatures and pressures. To compress the syngas mixture to the pressures required to feed the gas turbine combustion chambers uses additional energy. Also, burning any hydrocarbon fuel, whether it be syngas, kerosene or whatever, with pure oxygen at high pressures is a process currently possible only in exotic space shuttle type combustion chambers. Of course a space shuttle, or any other rocket combustion chamber, is not expected, nor designed to operate continuously for more than a few minutes at any one time. And certainly not for twenty-four hours a day, seven days a week, for decades.

The exhaust gasses exiting the combustion chamber are too hot for even the best current gas turbine engines, so they have to be cooled. The idea is that this is done by spraying water into the combustion stream. It is envisaged that the cooled gasses would then be used to drive standard turbine electric generators. Advocates of this system suggest that super-ceramic, extreme temperature turbine blades will soon be developed which would mean that the gasses need only be cooled to around 800ºC (1,500ºF). Currently commercial maximum power turbine systems can't be made to operate above about 550ºC.

The exhaust gas from the process would predominately be a mixture of carbon dioxide and water. The other pollutants, such as sulphuric acid and nitric acid, would need to have been removed beforehand.

Finally the exhaust gasses, being relatively pure carbon dioxide, can be compressed in suitable compressors, or frozen solid, to be again delivered to some "designated final disposal system".

For reference on the above, there are two notable scientific papers that discuss the above carbon sequestration concept. One was compiled by Joel Martinez-Frias, Salvador M. Aceves, and J. Ray Smith, all of that most prestigious establishment, the Lawrence Livermore National Laboratory in Southern California. The other author was Harry Brant, of Clean Energy Systems, Inc.

The second paper arguing the concept was a presentation to the Second Conference on Carbon Sequestration held in Virginia in May 2003. On face value the paper seems very convincing. There were four authors, all from Clean Energy

Systems, Inc; one was the same Harry Brant.

Both papers are surprisingly (or unsuspectingly) convoluted. The apparently reasonable costs they infer are definitely based on unrealistic assumptions, or at least very opportunistic presumptions. Our analysis indicates that, at best twice as much coal would be burnt and twice as much CO_2 would be produced as from any current state of the art, run-of-the-mill power station. At the more probable, worst case scenario, the proposed concept would burn four or more times as much coal and produce four or more times the quantity of CO_2. The only conceivable advantage would be that the CO_2 produced would not be diluted with nitrogen and therefore more convenient to compress.

There are other sequestration suggestions. They generally use various components of the above concepts. Mostly they are based on the use of pure oxygen. The general aim is to obtain relatively pure CO_2 in a nitrogen free exhaust. But with all the proposals, energy is consumed and so more coal is burnt, and more CO_2 has then to be delivered to the "designated final disposal system", which incidentally is never designated.

One system that receives considerable government support is to use syngas in a system called an "Integrated Gasification and Combined Cycle" process, abbreviated to IGCC.

In the IGCC system the combustible gas mix is used to power a gas turbine, which powers electric generators. The waste heat from the gas turbines is then used to produce steam to power steam turbines to produce additional electricity. More fuel is used initially, but the extra efficiency of the gas turbine/steam turbine combination just about compensates by producing extra power. In most of the current natural gas fired power stations in operation today, this piggyback double turbine system is used, and is very effective.

Hydrogen gas can be produced from syngas. If super-heated steam is produced and then combined with syngas in a special reactor, the carbon monoxide (CO) in the syngas combines with the water (H_2O), and is converted into carbon dioxide (CO_2) and hydrogen gas. The hydrogen then has to be separated out from the CO_2. This incidentally is the process currently used commercially to produce industrial hydrogen. Syngas or natural gas can be used. It is unfortunate but the industrial quality hydrogen gas produced cannot be used in hydrogen fuel cells. By their very nature fuel cells require an incredible pure gas supply to function for any length of time. The extreme purity is needed to slow down the build up of contaminants on the catalytic surfaces.

The above system is the only viable process ever seriously considered to supply the raw base hydrogen for the much touted "hydrogen economy". In effect and in simple terms the "hydrogen economy" is already structured to be based on fossil fuels. The reality is that there is no sensible and viable alternative system for producing hydrogen gas in large quantities and the hydrogen produced can't be used in fuel cells. See Item 16: **FUEL CELLS AND THE HYDROGEN ECONOMY DREAM**, in Chapter 11: **ENERGY SYSTEMS WE USE NOW AND WHAT WE MUST USE TOMORROW.**

The second concept for the collection and ultimate sequestration of CO_2 involves solvents. Using solvents is currently the most common way of removing CO_2 from gas mixtures. The CO_2 used in industrial applications is almost universally produced by first entrapping the gas in a suitable solvent, and then extracting it from that solvent.

One of the most economical and safest industrial absorbers used to collect CO_2 for industrial use is an amine such as monoethanolamine. This particular amine fortunately is only moderately toxic. It causes eye, skin and mucous membrane irritation. Ingestion results in inflammation and bleeding in the intestines and digestive system. About four measures of amine are required to trap one measure of CO_2. The amine-carbon dioxide mixture is then heated to low superheat temperatures and the pure carbon dioxide is released. The amine is then available for re-use.

A joint project involving eight major energy companies in the European Union looked at the costs and practicality of sequestration of carbon

dioxide from exhaust stacks from petrochemical and power station exhausts. It is called the "CO_2 Capture Project" and is designed to develop CO_2 capture technologies. A paper was presented at the September 2002 annual meeting of the Gas Producers Association of Europe.

In the paper a feasibility study "using today's best available technology" and using an amine-based CO_2 capture system was examined. The authors studied the fitment of an amine-based sequestration facility onto an existing European refining and petrochemical complex.

On the second last page of the report it was noted that the sequestration unit considered capable of trapping the two million tons of CO_2 per year, required its own energy and boilers to operate. The report conceded that firing these additional boilers would produce another six hundred thousand tons of CO_2. The plant therefore, wouldn't sequestrate two millions tons. It would only sequestrate one million, four hundred thousand tons of CO_2. The detailed cost analysis breakdown listed a total capital cost of US$476 million for sequestering what would amount to less 1.4 million tons of carbon dioxide.

However, a coal-fired power station supplying a city of one million people would produce around twelve million tons of CO_2 per year. Our million people city would thus require a plant costing US$4,080 million. That's four billion dollars. That's about four times the price of the actual power station. Also somewhere in such a system, in continuous circulation, there would have to be about a million litres of toxic monoethanolamine plus the extra needed for regular topping up.

The concept of using such processes and chemicals to remove CO_2 from power station exhaust gasses is simply not feasible in any way, shape, or form. Don't believe it when they say: "The technology is just around the corner".

The list of schemes for sequestering carbon dioxide is only exceeded by the list of companies seeking government grants to study their own touted solutions. As far as the fossil fuel producers are concerned, the more the merrier; it keeps people believing an answer is imminent. And when people feel that, Global Warming fears can again be put on hold. But no matter how good any carbon dioxide sequestration system might be, (or how good they are claimed to be), we finally have to ask the obvious question; "What do we do with the carbon dioxide after it has been collected?"

Carbon dioxide by itself has a variety of industrial applications. When it is frozen it becomes the substance we know as "dry ice". It is used to conveniently keep ice cream and similar products at low or below water freezing temperatures. Carbon dioxide gas is used as a flux in electric welding. It is also a raw material in the chemical and pharmaceutical industries. And of course carbon dioxide is the gas in the bubbles in carbonated drinks. However, the worldwide industrial use of carbon dioxide for such applications would barely exceed the carbon dioxide discharged from a power station supplying one single world city. As a product in itself, the reality is that carbon dioxide does not have a big market. And after it is used in the market it does have, it still finally ends up in the atmosphere.

So where can it go? Consider our one million people coal-fired power station with its power output of 1,000 megawatts. Let's assume the coal is delivered to the power station by rail. That power station would need a rail train five miles, that's six kilometres long, full of coal and delivering twice a week. That's what they use.

Today the coal is more likely to come from an open cut mine than from an underground mine. Underground mining is more dangerous and more expensive. Digging holes underground is not cheap, which is in itself relevant to sequestration.

Now to simplify the carbon dioxide problem, let's imagine the carbon dioxide produced from the power station is compressed to the equivalent volume, or frozen to the volume of dry ice. Coal and the dry ice, roughly speaking, weigh about the same. Remember two trains a week brought the coal in. With carbon dioxide sequestration in operation, every day from our power station,

including weekends and holidays, out comes a rail train, five miles long, with every freight truck filled to the rails with dry ice.

Is that right? Yes it is; coal is mostly pure carbon and carbon has an atomic weight of 12. So let's say we have 12 train loads of coal coming in. Coal burns to become carbon dioxide or CO_2. Oxygen has an atomic weight of 16. So carbon dioxide weighs 12 + 16 + 16. We therefore have 44 train loads of dry ice coming out.

The next problem; all that dry ice has to be dumped somewhere. You can't sell the stuff. You can't even give it away. There is just too much of it. And it keeps coming. Pump it into old oil wells they say? That's no solution. The carbon dioxide produced from the world's power stations would fill all the world's empty oil wells in months.

Naturally, any future oil wells are most definitely not available, as every barrel of oil that comes from them also becomes another two and a half barrels of dry ice. Oil wells can't handle their own CO_2 waste. There are simply no holes, natural or man-made, anywhere in the world that could ever handle the quantities of dry ice or CO_2 involved.

Another suggestion is to pump it into underground sand beds and hope it won't ultimately seep back to the surface. Out of the question; power stations are built as near as practical to coal deposits. With all their tunnels, these are not even hypothetically leak proof carbon dioxide repositories.

The money involved in such schemes, were they possible, is so ludicrously high it would be cheaper to run a power station on sugar derived ethanol, or even peanut butter. Safe carbon dioxide disposal is a problem thousands of times more difficult than nuclear waste disposal. Carbon dioxide is a hard to contain gas and unlike nuclear waste, carbon dioxide lasts forever.

The concept of continuous carbon dioxide sequestration is pretence. The idea has only one plausible objective and that is to have us believe a technological solution is not only possible but also probable. It is simply a means to keep responsible people placated. It is to prevent people from acting decisively to halt Global Warming. It's simply to maintain sales of fossil fuels.

With Global Warming causing such havoc there is just no conceivable way that coal should ever be used as an industrial fuel in any human society, now or in the future.

STRATEGY 22

ESTABLISHING THE MYTH THAT NATURAL GAS IS ENVIRONMENTALLY FRIENDLY

Natural gas as an energy source is being sold the same way as "clean coal" is being sold. The marketing people utilize the principle that a lie is much easer to sell when it contains a small measure of truth.

Most of the compounds that form acid rain and the other impurities always found in coal and oil are almost nonexistent in natural gas. It is therefore marketed as an "exceptionally clean" fuel. In this respect, the waste from burning natural gas can be compared with that from burning coal where the coal exhaust gasses are well filtered before being discharged into the atmosphere.

The impurities removed from coal-fired power station exhausts and the impurities that conveniently do or don't exist in natural gas have almost no relevance whatever in the destabilization of world weather patterns. Carbon dioxide discharge, as always, is the major villain behind Global Warming. Claiming that natural gas is a clean fuel is dangerously muddying the waters of truth.

Another major marketing ploy used in promoting sales of natural gas is to claim that the quantities of carbon dioxide discharged is significantly reduced while still producing the same power output. This is claimed for both motor vehicles and power stations. It is sad, for as a means of reducing Global Warming the reality is otherwise.

Of all the energy-producing compounds in natural gas, the highest proportion by far is that of methane at around 90%. Ethane generally makes up the rest. For the same energy output, burning pure methane gas does not produce as much

carbon dioxide as burning oil or coal. Compared to a clean coal-fired power station, a natural gas fired power station, burning pure methane gas, would produce about 30% less carbon dioxide.

Unfortunately almost every known deposit of natural gas in the world already contains free carbon dioxide. Natural gas deposits in Indonesia for example often comprise 50% CO_2. That carbon dioxide is released into the atmosphere without the production of any energy whatever. Removing high levels of naturally occurring carbon dioxide is both a high energy and carbon dioxide generating process. In most cases raw natural gas is burnt to produce the energy to remove the carbon dioxide from the remaining natural gas. Burning the Indonesian natural gas for power would produce more greenhouse gasses than burning coal from the worst coalmines in the world.

In addition there are always significant losses from leakage when handling any gas and as none of the constituents of natural gas are overly toxic natural gas losses are only ever minimized to commercially acceptable levels. Gas is constantly escaping to the air. As a greenhouse gas, methane is about twenty times as bad as carbon dioxide. With the CO_2 generated by its burning and with the leakages that occur in commercial gas handling from well to consumer, natural gas becomes no better and often far worse a fuel than oil, petrol or diesel. And can often be worse than coal.

Using rare carbon dioxide free natural gas and being only slightly simplistic, the best we can say is that three natural gas fired power stations produce as much carbon dioxide as two coal-fired power stations.

US WORRY OVER GAS RESERVES

Natural gas reserves are only 10% of the domestic fossil fuel reserves in the US, so the second Bush administration actually discouraged the utilization of natural gas. The fear being that encouraging its use could ultimately make the US even more dependent on foreign oil and gas supplies than it already is. As has been noted, the US has lots of coal.

STRATEGY 23

CLAIMING THE WORLD WILL RUN OUT OF OIL THEREFORE GLOBAL WARMING IS TEMPORARY

A problem of supposed limited oil reserves is a marvelous public relations argument. The argument goes like this.

If the worst comes to the worst and we keep burning oil at our current rate we will rapidly and inevitably exhaust our already depleted reserves. Powering the world with alternative energy will by necessity automatically follow. The inventiveness of man, combined with simple market forces, will ultimately, and unerringly, lead us to a solution to all our Global Warming problems. We may have temporary climatic disasters but, *voila!* our grandchildren will be O.K.

Utter nonsense, the facts don't support the argument. The fact is, there is more oil, more gas, and more coal under the ground than there is air above the ground to burn it and leave us with a breathable air mix.

All of the oxygen existing in our atmosphere today came originally from huge quantities of naturally occurring carbon dioxide spewing out of volcanoes. The carbon dioxide was split by plants using photosynthesis. The carbon ended up as dense fossilized materials, oil, coal or peat and a not inconsiderable quantity in enormous buried bubbles of methane and like gasses. The oxygen went into the atmosphere. Some of it was consumed in oxidizing exposed rocks and minerals. Some combined with carbon and calcium to form the skeletal structures of living things. These ultimately became the world's limestone deposits. Some oxygen remained in the air, and that's what we breathe and what we have evolved to breathe.

The point is to totally burn all the fossil fuels in the ground would require all the oxygen that exists in our atmosphere. Long before that could happen we would all die. Breathing as little as 1% carbon dioxide is uncomfortable and will give you a headache after a short time. Breathe much

higher concentrations and your lungs will go into uncontrollable spasms and you die in a matter of minutes.

The scenario of ultimate fossil fuel depletion and therefore a termination in the expanding chaos of Global Warming and climate change suits the marketers of fossil carbon-based fuels. For them it leads to a highly desirable sense of complacency in an otherwise thinking, worried, and concerned community. Responsible people are lulled into a false sense of security, and that suits the oil companies perfectly.

This whole concept of running out of oil and other fossil fuels is a fiction and the oil and gas people know it. However, strategically it would not be astute marketing to actually proclaim that running out of oil will save the planet. All too easily, and quite correctly would geologists, environmentalists, and some wiser green movements, dispute such claims and severely embarrass the oil companies' proclamations. So that would not be a good tactic.

Much more subtle types of campaign procedures are called for. A whisper campaign would be ideal – worth attempting but difficult. Media stories are better. A series of reports such as, "the results of some research conducted by some (unnamed) responsible organization" showed that Global Warming would self-correct as oil stocks were depleted, are perfect. Of course this type of copy must never be seen to have originated from its actual source.

Done well, this is an extremely effective procedure. Thinking citizens should watch for this ploy in action. We should recognize it and we should appreciate its insidious and powerful influence.

A much more subtle approach, and one that actually gets the same message across, is to loudly foster the totally impossible concept of having the country massively and radically reduce its use of energy, purely as a conservation measure. Advertising and editorial can then constantly warn the public of "our dwindling oil reserves". We are also warned that with our current rate of use, our current known reserves will be totally depleted within, generally, thirty years. Even in the early 1960s we were warned that the world will run out of oil within thirty years, so conservation was important. Noble, responsible, almost patriotic calls are made by green pawns for smaller and more efficient cars. Calls for the public to try and change their driving habits to get more miles per gallon and conserve "dwindling world fuel reserves" are a public relations tactic. It's never actually stated, but the perception, the understanding, is clear. "We must be running out of these fuel sources so, logically, Global Warming can't last".

Of course the oil companies recommend that everybody should show responsibility and walk, or ride a bike, or use public transport to further conserve oil reserves. But they know we won't.

A spin-off from these approaches is that the oil companies get a wonderful green image in the process, and for them that is a real bonus.

The often-used term "world oil reserves" needs examination. World oil reserves are in fact only the known, and actually proven reserves. They are also reserves held by or owned by somebody or some legal structure. They are nothing like the real total of extractable oil existing on the planet. Claimed oil reserves have never in the past ever exceeded about thirty years supply. That's just practical common sense, for when easily accessible reserves are found that would suffice for thirty years or so, why would anybody spend huge sums drilling for more?

In addition, techniques are now perfected to enable oil producers to extract oil from old "exhausted" fields, such as exist in Texas and Pennsylvania and other places all over the world. Some of these newer techniques are expected to make possible the extraction of more oil than was the total take from the old, now supposedly exhausted, oil fields.

Total world oil reserves now remaining – and this is shown by almost every indicator – are actually considerably more than has ever been extracted since the first wells were drilled. We have our usual thirty year supply. There is simply no shortage of oil. Global Warming is only

preventable by us switching to different energy systems. There is no way climate change will be halted because the world might run out of oil.

In addition, total world gas reserves exceed known oil reserves many times over.

In addition, total world coal reserves are so huge they make oil and gas reserves pale to insignificance.

In addition methane deposits in ocean sediments far exceed all the above.

Whatever it is, be it coal, or oil, or natural gas, what comes out of the chimney is carbon dioxide and that carbon dioxide wasn't in our biosphere before we dug it out of its grave and and released it by fire. The oil lobby doesn't want us to appreciate that simple reality.

STRATEGY 24

THE DELAYING TACTICS OF BIODIVERSITY STUDIES, FEASIBILITY ANALYZES AND ENVIRONMENTAL REPORTS

The fossil carbon industries use delaying tactics to prevent and forestall any substantial move towards alternative energy and chemical free agricultural systems.

One technique that has proven most effective is to have green organizations do their work for them. Build a coal-fired power station, build an oil refinery, run an oil or gas pipeline across the country, there is never trouble. You want trouble: try building a hydroelectric power station, or construct wind turbine towers, or build a tidal power facility, or try building a geothermal power station. They're trouble. The green movement along with a whole host of supposedly responsible organizations will demand an "environmental report". When this is completed it will be disputed on an endless range of minor issues. Then the inevitable creation of a "biodiversity crisis" follows; at least some insect is sure to be threatened and this of course needs a separate and prolonged investigation. And on it goes.

Sadly it is always individuals with restricted access to funds that are the ones fighting to produce alternative power systems. Against them are governments with unlimited tax money, coerced by blind green pawns with petrodollars. These are the people so effectively preventing alternative energy development.

If done properly, demanding environmental reports, demanding more information and then demanding still more information, coupled with ethereal biodiversity investigations, not only creates never-ending delays, but also demonstrates an apparent, although false, display of noble responsibility by the oil interests and their bed fellows.

It is difficult to define an absolute truth in anything, so conflicting information can be fed into these expensive and time-consuming reports to create total confusion and uncertainty. A little lobbying can bury common sense for decades. A little negatively biased editorial, no doubt manipulated by corporations with advertising muscle who do not wish to see the expansion of alternative energy systems, and we see wise and sound projects sunk.

A green movement then claims very vocally a "victory for biodiversity". And quietly and behind closed boardroom doors the fossil carbon lobbyists laugh.

STRATEGY 25

SUPPRESSING DEVELOPMENT IN HYDROELECTRIC POWER

Electricity generated by letting water run downhill through a pipe and then into a turbine is the most sensible way to produce electricity known to man. There is no waste product, no soot, no carbon dioxide. Dams can be built in most areas of the world. In addition, once the hydroelectric power station is constructed, the energy is free. Hydroelectric power is a wonderful source of energy. As power demand fluctuates throughout the day, electricity output is controlled simply by adjusting a water tap.

Destroying the clean image of hydroelectric power was a real challenge for the public relations people that service the fossil fuel companies. On

face value it must have seemed like an impossible task. In retrospect the brilliance and ingenuity of their campaign has been amazing. Against what must have appeared as impossible odds, they succeeded. They did it. Utterly clean, utterly green hydroelectric power now has a "bad name". A good image has been totally destroyed, and a bad one installed in its place.

How was this done? The fossil fuel public relations organizations fostered or created suitable green movements for the job, and then they moved them and manipulated them like pawns. They became their green pawns. They created what was in effect an anti-hydroelectric movement. That was the hidden agenda. What we saw in the media and on the streets were campaigns to save rivers, campaigns to save farmlands, campaigns to protect endangered species and campaigns to protect the wilderness.

What are never mentioned in all these image-modifying campaigns is Global Warming and the resultant destabilization of every weather system on the entire planet.

Tasmania is a good example. The Australian island state of Tasmania has the greatest potential for cheap efficient hydroelectric power of any state in the whole of Australia. Electric power could be fed north across the short intervening Bass Strait to power industry on the mainland.

The THREE GORGES DAM on the YANGTZE RIVER.
The lake formed will be six hundred kilometres long. The river to the north is the Huang He or Yellow River. The river to the south is the Mekong. All three are fed by snowfalls on the high Tibetan Plateau.

The green movement stopped the hydroelectric dams. Now a gas pipeline has been constructed that feeds gaseous fossil fuel from the mainland, south across Bass Strait into Tasmania. Environmental organizations claim this as a victory.

The fossil fuel organizations run a never-ending war against hydroelectricity. In the past, as in the above case, they have usually won.

GIANT CHINESE HYDROELECTRIC SCHEME'S CONSTANT CRITICISM

But not always. Premier Li Peng turned the spade inaugurating the commencement of the world's biggest single hydroelectric project, The Three Gorges Dam on the Yangtze River in December 1994. The dam will be bigger but comparable with Hoover Dam on the Colorado River. The Yangtze discharges into the southern end of the Yellow Sea a few miles north of downtown Shanghai. The mighty Yangtze, with a length of 3,900 miles (6,300 km), is the third longest river in the world. It's only 260 miles shorter than the Nile.

Three hundred thousand people have died this century just ended from floods on the Yangtze River. This terrible death toll will stop when the system is completed. The dam will create an inland lake four hundred miles (600 km) long. It will become a marine superhighway servicing millions of people.

When the whole system is completed, and that should be by about 2010, it will generate eighteen thousand megawatts of power, enough to give a hundred million people electric power. It will alleviate the discharge into the atmosphere of 200 million tons of carbon dioxide every year. That's like eliminating 20 major coal-fired power stations.

But hydroelectricity always has its well-paid critics.

American consultant Philip Williams, of Philip Williams Associates, was president of the International Rivers Network. This is a non-governmental organization that regularly campaigns against any large hydroelectric dams. He pronounced that the dam would not prevent flooding at all. Yet, one pet argument against the building of hydroelectric dams generally is that they do just that, and that is a supposed fault; they prevent downstream flooding. The argument is, if flooding is a regular occurrence on a river, the river ecology will have modified itself to survive the floods. So flooding is then an "ecological necessity" in this piece of prize ecological nonsense reasoning. On one hand hydroelectric dams are therefore an ecological disaster if they prevent flooding, but on the other hand, they should only be built if they do prevent flooding.

It seems that for green movement their criticism need not be consistent, and need not be logical, only excepting it seems for their ongoing assistance in the marketing of fossil fuels. The criticism just needs to be very loud and very public.

Williams claims that large dams might encourage "undue confidence" downstream. He asserts that if the dam should not hold back some future flood, then "the loss of life would be greater than if the dam had never been built." He further argues that the "consequences of failure at Three Gorges Dam would rank as history's worst man-made disaster". It's argued that, if the dam broke, maybe three hundred thousand people would die. But we must not forget that three hundred thousand people have already died in the last hundred years because the dam was not there. The yearly loss of life would undoubtedly have continued if the dam was not built.

Then we have John Morris, a former chief of the US Army Corps of Engineers who stated authoritatively that landslides, earthquakes or especially military action, could all breach the dam wall. Presuming that to be the case, it might well be argued that the Chinese possession of such a dam as the Three Gorges could well discourage future Chinese leaders from military aspirations when they have such a supposedly vulnerable target sitting there.

Dam walls that are badly designed have been known to break, but it is extremely rare. Flooding from sudden massive rainfalls however is extremely common. Flooding is also getting progressively worse in our de-stabilizing world climate. It should be noted that flood rains cause more deaths and destruction than from any other natural causes on the planet, tsunamis included.

STOPPING ALTERNATIVE ENERGY IN BULGARIA

A typical, nonsensical attack on hydroelectric power occurred when an East-West environmental conference was held in Sofia in Bulgaria in 1989. It was a very important conference and was attended by thirty-five nations. At the conference, Ecoglasnost, Bulgaria's own proclaimed green movement, had collected 11,500 signatures before and at the conference, demanding wider general public consultation on environmental issues. It would have been unlikely that many delegates would have refused to sign a partition put like that. It was also that sort of a conference.

Ecoglasnost asserted that this show of environmental interest supported one of their own pet causes, namely that a particular hydroelectric power station complex should not be built. The plan in question was the Rila and Mesta River development. This pollution free, hydroelectric power that could have been generated from the Rila and the Mesta Rivers in Bulgaria was effectively put on hold. Coal thus became the assured energy source. Natural gas is now imported from the new Russia. Quiet incongruously, about 40% of the electricity generated in Bulgaria is nuclear as Bulgaria was once a USSR satellite state. But installing more nuclear power stations is being vigorously resisted by other green movements.

QUEENSLAND HYDRO STOPPED

In Australia along the Queensland coast, near the mid-point of the Great Barrier Reef and just south of Cairns lies the town of Tully. The nearby Tully-Millstream Hydro-Electric Scheme was to be expanded. The new scheme consisted of two

dams and two small weirs. The water turbines were to be built deep underground and would have operated with 2,500 feet (700 m) head of water for maximum efficiency. The scheme would have created lakes with a total surface area of 10,600 acres (4,300 ha). Locally, there are 1,600,000 acres (650,000 ha) of tropical rainforests, of which a tiny 300 acres (120 ha) would have been "affected", not necessarily flooded, just affected by the dams. Our society seems to becoming so stagnant that just affecting something becomes an environmental no no if alternative energy is being contemplated? The output of the power station was to be 600 megawatts; that's enough power for a city of over 600,000 people. The generation of this power would emit zero tons of carbon dioxide a year.

The green pawns of the fossil fuel lobbies were called in to do their well-rehearsed rallies, ostensibly to "protect the environment", mainly the 300 acres of "threatened rainforest". In their small, but well-filmed and well-documented numbers, they protested against the construction of the complex. The media, obeying the dictates of their advertising customers, supported (they say "reported") the protesters and their rallies. The Tully-Millstream Hydro Scheme was stopped. The Queensland State Government thought they were obeying the wishes of the people. Or that's what they claimed. In the driest continent on earth, another fresh water storage system was stopped. Six hundred megawatts of pollution-free electric power will not be generated. Coal will produce the power.

SABOTAGING THE HYDRO-QUEBEC POWER PLAN

The success of the oil, coal and natural gas lobbies in minimizing or eliminating any threat to their monopoly on world power is frightening. They are in a continuous process of sabotaging a giant project that will prevent two hundred and fifty million tons of carbon dioxide per year being dumped into our atmosphere. To put things in perspective, we are discussing the carbon dioxide production from twenty million motor vehicles.

The project they are fighting is being undertaken by Hydro-Quebec in Canada and involves the creation of over two hundred man-made lakes. These lakes would power hydroelectric turbines and produce enough pollution free electricity to supply the needs of thirty million people in a Western society.

The project is the James Bay Power Project, located in the southeast corner of Canada's Hudson Bay. Hudson Bay is a Sub-Arctic region on about the same latitude as Denmark, Latvia and Moscow. Ireland is also on about the same latitude, but things are warmer there, as the Gulf Stream hasn't as yet stopped flowing.

The projected power output of a fully completed James Bay Power Project is more than ample to supply the needs of Quebec and all of Eastern Canada. In addition, pollution-free power can be sold south, and flow into the grid system servicing the cities of Boston, New York,

Showing the location of James Bay in eastern Canada. The dots in the illustration show some of the larger lakes. There are over 2,000,000 lakes in Canada. They have never been counted. There are more lakes in Canada than the rest of the world combined. The larger dots are cities.

Philadelphia, Pittsburgh and Detroit. It could generate export income for Canada of at least a billion dollars a year.

For the oil and coal producers of North America, the James Bay Power Project is a major unwanted competitor – it would be better if it could be stopped.

The vast Sub-Arctic catchment area that would feed the new lakes and generating facilities has a total population of fifteen thousand people. That's the size of a small Australian country town or the size of a single inner-city suburb. Obviously the fossil carbon energy people are recruiting all their naïve friends, those in "wilderness conservation" and "environmental protection", to ensure that as much as possible of this project is stopped. The public relations people and the lobbyists come out in force and have a field day. Most of the local inhabitants around James Bay are of Cree and Inuit Indian extraction and this provides plenty of fuel to generate emotive arguments, which is done. But all angles, especially emotive ones, however farcical, are always explored and exploited.

For example: Trace quantities of mercury occur in many geological structures and the geology of this part of Quebec is no different. Concentrations between 20 ppb and 6,000 ppb of mercury occur in soils in North America. The environmentalists claim that the mercury gets slightly concentrated in vegetation. In fact mercury does not accumulate readily in plants and is typically less than 20% of the concentration found in surrounding soil. (Although some eatable mushrooms (*Pleuritus ostreatus*) can increase mercury concentrations massively.) It is argued that when the dams are finished and filled, mercury will be released into the water from the flooded decomposing trees. It is further claimed that it will then contaminate the millions of fish that will ultimately colonize the new waterways.

But the arguments don't make sense.

If the country to be flooded after the construction work is completed is heavily timbered, it could be typically covered with one hundred tons of trees per acre, (250 tonnes per hectare). So the total mercury content in the trees on one acre of ground would be 3.5 ounces (300 grams per hectare). When the dams are flooded, they'll probably easily average in excess of 30 feet (10m) deep. So an acre of land would be covered by possibly 50,000 tons of water (125,000 tonnes per hectare). So the final concentration of mercury in the water would be 3.5 ounces per 50,000 tons or 2.4 parts per billion. And that's if all the trees rotted instantly and the water sat there totally stagnant indefinitely! Of course it isn't going to sit there stagnant, as it's a hydroelectric project and hydroelectric power only works when water flows down hill so mercury levels will naturally be much lower.

The United States Environmental Protection Agency, their EPA, sets a limit of 2 ppb of mercury in US drinking water, although in truth some drinking water gets as high as 10 ppb. So those fish are going to be swimming in water that the United States' own EPA says is perfectly safe to drink. That's when it first fills with water and the timber somehow instantly all rots. After that mercury levels will rapidly decline.

The environmentalists' arguments are totally meaningless. That's possibly why the public relations people fighting hydroelectric schemes never quote actual numbers.

In this day and age, modern scientific equipment can detect just about anything and in just about everything, right down to detecting individual molecules. "Scientific tests" can therefore be quoted to "prove their claims" of mercury "contamination". There is enough mercury right now in your little finger for these instruments to detect.

Of course, it is more logical to harvest the timber before the lakes fill than to leave them to rot, so then even this hypothetical mercury problem wouldn't exist. But then of course if that happened, the green-trained "hug a tree" troupe would be called in to perform their unique padlock and chain dance.

As some of the electricity is being exported to another country, (over the fence into the United States,) the Canadians have been manoeuvred into accepting that the Canadian Federal Government has ultimate control and responsibility. Compliance

with all the irrational political environmental arguments and regulations that the Canadian government, like other federal governments around the world, is prone to imposing has become an additional obstacle in this project's life.

The project will affect the hunting lifestyles of some of the local Indians. It is argued by the oil companies' green movements that this should not happen. The lifestyles of the local Indians, that Canadians are being coerced into protecting, depend for their existence on trapping and killing wildlife, not to eat but for their skins. These skins will end up in a store near you. It seems somewhat irrational for a so-called green movement to support such a cause. The concept is apparently justified by green movements on the basis that early man has traditionally wiped out wildlife and thus has a right to continue.

The fossil carbon lobby and their stooges are having some success in preventing the James Bay Hydro-Electric Project from proceeding. The project has been put behind schedule while "environmental impact" studies are being undertaken. These delays have threatened contracts with major utility companies in the northeastern United States, who are naturally wary of the distorted influence of the so-called environmental movements.

The James Bay Hydroelectric Project would be a significant contributing factor to safe-guarding our planet's atmosphere and climate. The objectors to the James Bay Hydroelectric Project are displaying a degree of vandalism almost unparalleled in the environmental history of man.

Mercury dangers from hydroelectric projects are an incredibly exaggerated nonsense. It's a public relations fiction. But mercury pollution from coal burnt in power stations is a very different, and very frightening story. It's also a story rarely told.

So what is that reality? Mercury is very poisonous and most poisonous when inhaled. As a comparison, injected poison from a Diamondback Rattlesnake is about two hundred times more deadly. Inhaling the nerve gas, Sarin is only about thirty times worse than mercury vapour. Over 90% of the mercury entering the environment worldwide comes out the exhaust stack of coal-fired power stations. And it's virtually impossible to remove. It becomes part of the air we breathe. For energy, the world burns about four billion tons of coal a year. Depending on the source, some coal-fired power stations spew half a ton of mercury vapour into their local atmosphere every year. Then it starts to circulate.

The high mercury levels in fish caught in the open ocean, hundred of miles from any land, in the main comes from coal-fired power stations. No ocean in the world, no lake in the world is immune. No fish is safe from this form of mercury pollution. One estimate claims one drop of mercury in a 25-acre area lake would make the fish unsafe for pregnant women to eat. This is possibly overly cautious but an eggcup full would make the water itself un-drinkable. That's omitting any ongoing biological concentration. Every year, so the US Environmental Protection Agency reports, their coal-fired power stations discharge over nineteen tons of mercury vapour into the air.

For mercury pollution; coal is the villain, not hydroelectric power stations. Don't let people claim it's otherwise.

STOPPING DAMS IN INDIA

In India, in Madhra Pradesh, a series of irrigation and hydroelectric dams are planned for construction on the Narmada River in Central India. When completed they would supply clean water and power to an estimated 30,000,000 people. A well-publicized environmental report, typical of many, discussed these dams and the Narmada River Development Project. The whole concept that pollution-free hydroelectricity could be produced in huge quantities is not mentioned in the report. The prevention of downstream flooding is not given one line. The supply of reliable irrigation water to produce food for an overpopulated and undernourished nation is never mentioned.

What is mentioned is that 40,000 hectares of

"prime wildlife habitat" will be submerged. What is mentioned is that 100,000 hectares of forest and agricultural land will be submerged. In India, with a population of a billion people, if it's still "prime wild habitat" it could not have been worth farming. What is also mentioned is that possibly 160,000 people will be "displaced". The wording is always "displaced" which is obviously more emotive than simply "resettled".

There are reportedly 369 species of plants that will be "drowned" by the Narmada Sagar Dam alone. The way the report is worded implies that it would be an horrendous annihilation of species. The copy however does go on to say that there are really only 31 species that are "rare in the area and could become extinct locally". The same argument applies to kangaroos in downtown Sydney. It is also valid to re-phrase it and say that not one single species is in any way threatened by actual extinction.

Another survey in the area suddenly discovered 53 plants with "medicinal use" that, it is conceded, "may not disappear, nevertheless local knowledge on how to use these plants is at risk of being lost". The survey further claims that there are 209 species of birds that live in the areas to be flooded and these will have to move away from "their preferred feeding and nesting sites". It can be expected that millions of water birds would flock to the area, but this also is not mentioned in the reports.

Fish species are also supposedly threatened by the construction of the dams. Again, it is conceded in the reports that there are 440 species of fresh water fish in all of India. Of this 440 only 25 are considered as endangered, 20 are considered vulnerable and really only 14 of the 440 are rare and in need of "urgent attention", but no one is too sure where in India these 14 species actually survive best.

The report does mention that the loss of these rare species cannot justly be blamed entirely on the construction of storage dams. The report points out that industrial pollution, the introduction of "exotic species", i.e. fish from some place else, and (surprisingly) indiscriminate fishing using dynamite, also have had an effect on local fish species.

There was a gold and black striped Indian fresh water fish called *Etroplus canarenis*. The last recorded sighting was in 1878 by a surgeon, Francis Day, employed by the government of Madras. More recently it became "officially" extinct. But this fish, it now seems, is not extinct at all, and obviously never was. They have been "re-discovered", and there are plenty of them not far from the city of Bangalore, in South Central India.

Possibly the gold and black *Etroplus canarenis* could live very happily, and multiply, in the new dams on the Narmada River.

Every hydroelectric project, anywhere, anytime, reduces the sale of coal or oil. If you are in the oil or coal business such projects must be stopped, or reversed, or at the very least, they must be incessantly criticized. The image of hydroelectricity must be under constant attack. One report criticizing the Narmada River Development Project actually and blatantly argues that oil would be a better and cheaper option for power generation in Central India.

It was reported in the Vol. 290 issue of *Science*, that a commission sponsored by the World Conservation Union and the World Bank, released a report in 2000 in which it was claimed that, for the most part, the cost of the world's major dams have outweighed their benefits. The report stated that "in too many cases" benefits have been gained at an "unacceptable and often unnecessary price". The price always being totally undocumented and unproven but taken to mean "irreversible loss of species, populations and ecosystems". The report also blithely suggested that hydroelectric power was not necessarily cleaner than burning fossil fuels. The report called for (time-consuming) halts for more research to be undertaken on the "environmental impact" of hydroelectric projects anywhere. Was it because hydroelectric power competes with fossil fuels that The World Bank also reduced funding for dam construction by two thirds?

A few years ago, creating a bad image for

man-made lakes and at the same time attributing mystical properties to rivers would have sounded idiotic and downright impossible. But it's been achieved. Today the emotional response by much of the population to rivers and man-made lakes is in accord with the fossil fuel lobbies' desired reaction.

There are a whole variety of geological occurrences that form lakes. A big cliff can collapse and block a canyon. An earth tremor can cause a hill to slide down into an adjacent valley. A small climate change can make the foot of a glacier suddenly move upstream and form a wall. Water then backs up behind these obstructions and lakes are formed.

Lakes are beautiful. But to sell fossil carbon fuel it is promoted that if they are man-made they cannot be thought beautiful. When lakes are created by man's enterprise, they are supposedly ugly and always environmental mistakes. In addition a "free, wild, happy, beautiful, sparkling, mischievous", etc., etc. river has been, "drowned, murdered, killed, buried", etc., etc. forever. These dreadful ecological disasters are then always attributed to the greedy, profit motivated, callous, uncaring, etc., etc. scoundrels that work for the mining, business, power generating, etc., etc. multinationals.

What a sad thing that these lakes that are the very brilliance of man's creations can come to be so scorned and denigrated.

Glaciers can build dams and bulldozers can build dams. There is no difference. In colder ages past, or even now in cold climates, glaciers – giant rivers of ice – grind and gouge their way down valleys, polishing and cleaning the valley floor and sides. The material is carried in the ice down to the end or tail of the glacier. The ice river melts when it reaches the glacial equivalent of the "snow line" and a giant heap of broken and shattered rock pieces accumulates. Over many thousands of years, a rock-debris wall is formed across the valley to the height of the trapped ice.

A warmer climatic shift starts the ice melting progressively up the valley. It may retreat several miles before it stabilizes to the new climate. Another wall starts to form at the new position. Downstream behind the first wall, water backs up, creating a lake. The walls of these glacial lakes are often incredibly even and regular as if designed in a civil engineering office.

The walls of man-made lakes can be of earth and rock constructions, the same as glacial lake walls. Otherwise they are concrete structures or combinations of both, depending on the engineering and economics.

The water in the lake, and the fish in the lake, are the same whether the wall came into being due to a climate shift, or an earthquake, or due simply to man's ingenuity and engineering skills.

Many countries with an abundance of natural lakes consider themselves truly blessed. Yet we are being systematically brainwashed to believe that lakes, when man-made, are a curse. It is interesting to note that there is no dam constructed anywhere in the world that receives any criticism whatsoever, provided only that the construction of the dam wall was a random geological occurrence. The lake was formed "naturally".

Of course the local environment changes whatever way a dam is constructed. Water birds don't inhabit dry creek beds, but if there is a lake there, they move in. Creek bed life moves upstream or they move out as they do every time seasonal flooding occurs.

Land dwelling life on our planet is totally dependent on the availability of fresh water. Any means that slows the inevitable movement of fresh water to the ocean is a bonus for all land dwellers. The eventual result of constructing lakes, either by accident or by design, is usually a rapid expansion and proliferation of wildlife. It is most definitely not the other way round. People should become aware of this, but to again quote Jonathan Swift:- "*There's none so blind as they that won't see.*"

The supposed ecological damage caused by mankind suddenly building ten million dams to produce hydroelectric power would be as nothing compared to what we are now doing by burning fossil fuels.

Even the Aswan High Dam is constantly criticized by the pro-oil anti-hydroelectric fraternity. The Aswan High Dam stores the waters of the Nile. The wall is built as far upstream, – that is as far south,- as possible and still have the water stored within the national borders of Egypt. A good quarter of that portion of the Nile that lies within the Arab Republic of Egypt is now part of the Aswan High Dam.

The Nile is the longest river in the world. It is also the only river that takes the immense rainfall of the planet's equatorial regions and transports the water right through the desert latitudes to its receiving ocean. See the map of Africa in Chapter 1.

The desert latitudes in both the Earth's hemispheres are between approximately thirty degrees and forty degrees of latitude, where lie the immense subtropical deserts of the globe. The Aswan High Dam is in a desert that can now be irrigated.

For Australians it would be like a river fed with the tropical rainfalls of Malaya, Borneo and Indonesia, a river which then meandered south through the Australian Central Deserts to finally discharge its water into the Great Southern Ocean near the city of Adelaide. What a blessing such a river would be. What an asset it would be to have a fresh water lake in dry Central Australia.

Sun parched Mexico lies in the dry latitudes between twenty degrees north and thirty degrees north. A Nile River in the Americas would be like the Amazon River turning north and doing its meander through the North American deserts. A giant river running through the Mexican Desert through Nevada, through Death Valley and discharging into the North Pacific Ocean at, say, Long Beach, California. Again, what a blessing such a river would be. That is what the Nile with its Aswan Dam is to North Africa.

Should we just dump fresh water of these immense quantities in the ocean when the supply of natural fresh water in the world is so limited? That is exactly what the critics of the Aswan High Dam wanted.

When river water flows into the sea it becomes salt water and useless. But when a river is dammed, once the dam is paid for, the fresh water is free and very, very useful. The hydroelectric power produced is also free. No wonder it is so important to the marketers of oil and coal and gas that an image is created, albeit a totally false image, that there is something environmentally sinful involved in the construction of water storage dams. In reality, it is gross environmental negligence not to build water storage dams and equip them with hydroelectric generators where ever they can be built.

There is no shortage of salt water. The oceans are full of it. In many parts of the world, oil is burnt to produce fresh water from salt water. An enormous market therefore exists for the use of oil to produce fresh water – for the oil companies that is another reason to oppose dam construction.

Part of the anti-dam marketing misinformation is that dams rapidly silt up. It is almost always a proclamation that in thirty years the whole exercise will prove to be a total waste of money, and thus an environmental disaster. The life of any dam, on any river, in any country, somehow has been arbitrarily nominated as thirty years; when thirty years specifically is quoted enough times it becomes another manufactured folklore myth. Such statements are made to distort and diminish the real value of dams. It's quite ridiculous; three hundred years would be nearer the mark.

Of course some silting does occur. Most major cities use man-made dams to supply the city with water. Many of those dams have been in place for generations and will be there for generations to come. They haven't silted up. Many naturally formed lakes have been there for thousands of years. Is it that man-made lakes silt up faster than lakes formed by geological accidents? Most unlikely.

The Nile carries more silt than any other river in the world. In the past, the silt that didn't end up in the Nile Delta, ended up in the Mediterranean Sea. That tremendous quantity of silt is now being deposited in the silt traps constructed at the inflow end of Aswan High Dam and thereby creating new farmland.

If, in the dim distant future, the Aswan High Dam did ultimately become silted up, it would only mean a new rich "Nile Delta" created deep inland in Southern Egypt, and surely that would be no disaster. The existing Nile Delta has to feed all of Egypt and yet it is no more than three percent of the land area of that country. Another "Nile Delta" if it ever did occur, would not be a bad thing at all, but in fact a great blessing. The population of Egypt has now grown to fifty-five million people. Without the Aswan High Dam, millions would be dying of starvation and malnutrition. The dam was essential.

The ecological disaster occurring in Egypt is not the Aswan High Dam. It is the rapid destruction of the fertility of the soil of the Nile Delta by the catastrophic increase in the use of chemical fertilizers. Per acre or per hectare, they now use twice as much chemical fertilizer on their soil as is used in the United States or Europe. In consequence, the soil is rapidly deteriorating. This soil collapse has occurred in the short lifetime of one average fertilizer salesman.

The oil companies are well aware that humans really do like lakes, and have since the dawn of humankind. Near lakes there has always been good hunting. People like to live on the shores of lakes. People like to fish in lakes. People like to sail on lakes. Lakes are invariably beautiful and surrounded by greenery, shrubs and grasses, trees and flowers. Lakes are a home for a huge variety of wildlife and lakes can supply us with cheap clean power.

But to sell more oil, the construction of new lakes must be stopped.

Somehow man-made lakes had to be seen by the general public as totally different from lakes created by geological phenomena. So the geological ones became "natural" lakes. Man-made lakes therefore became "unnatural", or as they are so often labelled, "artificial". They are not even allowed to be called lakes at all. They are dams. If dams can be sufficiently divorced from lakes in the public mind, then dams can be attacked selectively. Dams can be damned.

The possible "environmental impact" of a new lake can be made the subject of protracted and heated debate. Studies can be undertaken "in the public interest". The oil companies can, indirectly or even directly, fund a couple of university graduates, (in some obscure biological field), to study a proposed dam site. If they do, then it is a guaranteed certainty that some unique habitat, some supposedly rare animal or some obscure variety of ferns, or anything, can be found, and it can become a "cause célèbre". And whatever it is, it will be put at "grave risk", if a dam is built. The media, posturing civic responsibility and acutely aware of who buys their advertising space, naturally will produce copious quantities of supposedly responsible editorial damning the dam.

To prevent the construction of a dam, editorial is used to exaggerate and highlight the "environmental virtues" of the existing creek or river. Campaigns are promoted to protect the river. For this ploy to work more effectively, rivers must be given a suitable marketing image. So rivers are personified. We are brainwashed into feeling that the river itself has intelligent life, and should be treated as if they have emotional responses.

Said like that it sounds ridiculous, but it's not. Advertising works. Creating false images has worked for thousands of years. Modern advertising gurus have it down to a fine art. So we now have "wild" rivers. We have rivers "running free" and "rivers should be unhindered". Rivers can be "starved". Rivers can "whimper" and they can "sigh". They can be "turbulent" (both an engineering description and a lifestyle description so simultaneously correct and emotive). Rivers can also be "exciting". They can be "mysterious". But above all else rivers must be "uninhibited" by walls.

In other words no dams!

I am sure you have all seen words like these used to describe the river whenever a hydroelectric system is proposed. When words like these are used common sense goes out the window and emotive irrationalism comes up through the floorboards. As an exercise right now, think of a river for a few seconds. Use the above words to describe the

river. You will soon realize how easy it is to have your emotions and judgment manipulated. You can do it yourself, to yourself. Try it.

That's why advertising gurus are paid so well.

In an example of ultimate idiocy, it is being proposed that existing lakes (of course exclusively with man-made walls) should be drained to "release" the "soul" and the "beauty of the cruelly drowned rivers". Where then is the energy supposed to come from?

Have you ever heard of a proposal to drain a naturally formed lake to "release" the river that lies beneath? Of course not. That would be excessively idiotic and much too hard to sell.

Rivers are indeed often very beautiful. But in reality, what is beautiful is usually the shoreline. What is beautiful is the sides of the river, the contact area of the water and the land. An expanse of water by itself is not particularly beautiful. It is always the shoreline. It is the lake front. It is the ocean beach. It is the rocky headland. If we lose the sides of a river we gain a much larger lake side. It's different, but it's also nonsense to pretend it's wrong and ugly.

Those in the oil business and those who support the widespread use of fossil fuels will always plug for the river. They will never plug for the lake. And they will use their advertising dollars and their emotive propaganda to short circuit this threat of cheap clean hydroelectric power to their markets.

STRATEGY 26

HINDERING THE HARNESSING OF OCEAN TIDES FOR POWER GENERATION

The gravitational force of the moon has a considerable affect on our planet's environment. The distortion of the solid planet is very tiny but readily detectable with the right instruments. However, the effect on the liquid oceans is significant. We see this effect as ocean tides. The sun's gravitational effect also creates tides although they are small compared to lunar tides. The sun's ultimate effect is to slightly exaggerate, or to slightly diminish lunar tides.

Exaggerated tidal phenomena are quite dramatic in parts of the world. Some coastal areas constantly experience amazing tides, often over forty feet (12 m) from high to low. The water rushes in and out of the local bays and estuaries, twice a day, as regular as clockwork. Harness that massive flow and you have tidal energy. In some areas of the world, tidal power could present a real threat to local coal or oil or gas powered generating systems.

Tidal power is very similar to hydroelectric power in that both rely on controlling water flow with man-made walls. With hydroelectric systems, wonderful sites, sites that are practical and economical, can always be found upstream on rivers that are usually hundreds of miles long. Sites that often create hundreds of feet of water fall are not too hard to find. Trapping useful water in a river is generally easier and cheaper than in a bay, as is needed for tidal power.

There are rarely a great number of bays on most coastlines, and there are even fewer shallow enough to economically dam. And still fewer where tidal heights are large.

Sometimes however a city, a nation or a state may have few alternatives. Tidal power generating stations are unlikely to present any serious threat to the fossil carbon fuel suppliers, as there are few areas in the world where extreme tides and suitable bays are common.

But nevertheless the fossil fuel people will quite naturally, but never obviously, want them stopped. It is inevitable that no matter where a tidal power station is built, a bay or an estuary has to be walled off. This almost certainly will modify the local ecology in some way. Whether it is more pleasant the way it was, or the way it will be, is irrelevant. Any modification to the ecology is enough for a green organization to latch onto, or more likely to be steered towards.

Most "conservation" and "wilderness" and "biodiversity" organizations in reality support stagnation ecology concepts. Which is, don't touch anything, and stop touching anything if you have ever been touching it. Members may even live near

a proposed tidal power facility, and using them is cheaper than bussing in the necessary protesters. They can also be more easily harnessed. The relevant conservation and wilderness industries are then funded and supported to destroy any chance that a tidal power station could be built.

Worldwide, these efforts have been very successful. Tidal power generating facilities are exceptionally rare. They are now considerably rarer than are economically and viable sites where they could be installed.

STRATEGY 27

STOPPING WAVE ENERGY FROM BEING A SERIOUS COMPETITOR

Wave energy sounds like a hypothetical dream, but it's not. Several coastlines dotted around the world experience almost constant and large ocean waves. As a wave moves past a point, the immediate water level can change by ten or twelve feet (3 m or 4 m), several times a minute. This is like a complete tidal system change, not twice a day, but maybe three thousand times a day. Tidal systems need a bay with a large surface area, whereas an ocean wave system to produce commercial power needs a long coastline.

Wave energy may be tricky to harness, but the energy supply is large. Parts of the coastline of Western Europe, Ireland and the United Kingdom experience an almost constant impact of wave energy delivered by the North Atlantic swells. The European power grid, as a potential customer, is also just across the narrow English Channel.

There is a huge amount of free energy in waves. The coal, oil and gas suppliers to Western Europe would not want wave energy ever to get off the ground, or maybe out of the sea.

How would the fossil fuel lobby handle the problem of wave power? It would appear that one way to prevent its development might be to influence the people and the politicians making the decisions on wave technology research funding.

In a very controversial decision, wave technology research was virtually abandoned in the UK in the early 1980s. Funding was almost totally curtailed. Why, we will probably never know exactly, but we should worry. These are some of the things that happened.

UK BUREAUCRACY SINKS WAVE POWER

Professor Trevor Whittaker and his team in the coastal engineering department of Queens University of Belfast developed an excellent wave power generation machine. They had started research on wave power back in 1975. The machine was considered by many to be one of the world's most successful designs. A test machine continually pumped 75 kilowatts of electric power into the UK power grid.

It used an ingenious method of harnessing the wave energy. In their case waves funnelled into a man-made "blow hole", just like in a normal blow hole common along rocky cliffs. In the system, trapped air surges in and out of a formed cavity at a high velocity. Instead of seawater driving the turbines, the high velocity air did the job. Clever little turbines called Well's turbines, that always spin in the same direction regardless of the direction of flow, were used. The high air speed means high-speed turbines could be used, and these are easier and more efficient to couple to electricity generators.

It worked so well that the British Department of Trade and Industry decided it would not fund a bigger 600-kilowatt system. The installation they refused to fund would have supplied the electricity needs of a town of 1,000 people.

Also in the United Kingdom, a Stephen Salter invented another ingenious system for harnessing wave power; again in the early 1980s. The device, dubbed "Salter's Duck", bobs up and down on each wave and the energy is extracted to generate electricity. The Energy Technology Support Unit, part of the UK Department of Energy, passed on critical loading factors that were actually incorrect to an independent consulting body investigating the invention's feasibility. The consulting body was commissioned by the UK Department of Energy. Much later the UK Department of Energy,

to do it justice, did recall these false reports from libraries and institutions across the country. But the harm had been done.

The European Parliament received the false information and passed it on to the European Commission. The erroneous reports were then used to calculate the cost of electricity generated by wave power. In consequence a $20,000,000 research program on the general feasibility of all forms of wave-generated electricity was stopped.

It seems that at the same time a parallel study was carried out by Professor Tony Lewis of Cork University. This study also appears to have been fed the false information. The vice president of the commission at the time, Filipo Pandolfi, claimed that EC funding was withheld from the research because of the cost factors and it was therefore "premature to start demonstration in this field".

Lewis' study in fact actually recommended that research should go ahead. The study also showed that Europe's western coastline could produce 110 gigawatts of electric power. (Although this figure is probably overly optimistic and unlikely.)

Salter himself has queried "why are there some people in official circles who are worried about wave energy? Could it be that this is the one that might actually be a threat to certain established technologies?" An astute question.

The UK House of Commons Select Committee on Energy called for an "independent investigation" on the affair. Shades of "Yes, Minister". But who ultimately won? Sixteen years later the United Kingdom Department of Trade had decided that recommencing funding on wave power generation might be a good idea after all.

Private industries' efforts and research organizations' efforts to develop alternative energy systems are so easily thwarted by bureaucratic stop-start sabotage. Such counterproductive techniques are beautifully inconspicuous to the general public. Governments can appear to display responsibility for the environment while still jumping to the requirements of the fossil fuel industry.

The reality is that large-scale wave power generation is unlikely to be of any grave concern to the fossil fuel establishment until offshore installations become considerably more viable. A coastal wave power station capable of powering a city of one million people might have to be two or three hundred kilometres long.

STRATEGY 28

GEOTHERMAL IS A VIABLE BUT LIMITED THREAT TO OIL

When the Earth's unlimited geothermal heat is near the surface and economically accessible, electric power can be generated. Geothermal power is environmentally immaculate. It is as clean as wave, wind, hydro or solar generated power, and no large-scale structures, which are claimed to "spoil the landscape", are required.

For the marketing and image creating people working for the fossil carbon industries, geothermal power is another big problem to be handled. Creating pseudo-environmental issues and influencing policy makers in government seem the only options available to suppress this extremely economical but unfortunately limited source of free energy.

Geothermal phenomena are somewhat mysterious and often awe-inspiring so the PR gurus figure fear is the best image to hammer. It is not difficult to make people uneasy and fearful simply by suggesting the possibility of some sort of man-made earthquakes, or of triggering volcanic eruptions. It is no more logical than suggesting throwing a pebble in the ocean could cause a tsunami. Of course it can't. But their hope must be that if common sense and logic are carefully avoided then sufficient fear and doubt and general confusion might be generated that could effectively stifle geothermal power generation.

STOPPING THE HAWAIIAN GEOTHERMAL INITIATIVE

Geothermal power uses the Earth's own heat to produce steam for steam turbines. There are two main systems for extracting the heat energy.

In the first system holes are drilled and water is pumped down into the hot zone. The water turns to steam, and the steam is collected from another hole. In the second system which, when possible is far more practical and economical, the hole is drilled into high temperature geological structures already containing vast quantities of super heated water. The released steam comes up the pipes and again drives the turbines.

The Hawaiian Islands result from shallow volcanic material oozing up through cracks in the Earth's crust and forming islands. The Earth's crust in that area is moving west-northwest in relation to the deep underlying magma. Over a few million years, the original island moves off a few miles in this west-northwest direction. Eventually the original hot spot becomes reactivated. Magma oozes up. Volcanic eruptions occur and a new island is formed. The new island again drifts off in an arc to the west-northwest. Eventually an island "chain" is born. Many of the Pacific Island chains have this characteristic west-north-west layout. No oil or coal is formed in these relatively rapid geological processes.

The US State of Hawaii has to rely on the importation of vast quantities of oil for its power. The bill for this oil is a constant drain on the economy of the islands. One or two nuclear power stations would easily solve their electricity supply problem on the more densely populated islands. The Hawaiian economy depends heavily on the tourist trade and large-scale guided tours of usually secretive nuclear power stations might be a world first and prove a major tourist attraction. The antinuclear environmentalists however have firmly closed the door on this option.

One would then imagine that geothermal power would be the perfect choice for this Central Pacific group of islands. But that would interfere with the sale of oil. Geothermal power is constantly being suggested but always the well-trained environmental movement is called in to alleviate this perceived threat to the oil suppliers.

So the ever reliable "save the rainforest" and the "threatened biodiversity" banners are brought out of the toolbox. Of course members of environmental movements are constantly and invariably, re-encouraged to trust and believe that nobler motives are the inspiration and it's not just to sell more oil.

One piece of nonsense claimed by Hawaiian green groups is that drilling a hole to tap artesian steam may put at risk downstream, lowland rainforest from possible escaping steam. There are incredible quantities of steam constantly being released from volcanic activity throughout these islands. Are people expected to believe that maybe the steam is somehow different? Hogwash, the two are the same. Geothermal steam released after being used in a turbine is even safer. It's cooler and it's controlled. When steam exits a turbine, it contains a lot less heat energy than when it entered. It's random and furious volcanic events that the locals have to worry about.

The natural steam from geothermal vents often contains small and harmless quantities of radioactive radon. If that steam is used, or not used, for power generation it contains the radon. Nevertheless the US Federal Court ruled that federally funded geothermal research could not be supported in Hawaii until a "full environmental impact statement" had been prepared. Such environmental impact statements are easily manipulated into never-ending delays. Studies like this go on for years. One wonders just who went to the federal court to get such a ruling in the first place. But again, isn't the answer obvious?

In 1991, what was described as a "blow-out" happened on a drill site on the Big Island of Hawaii, not far from the Kilauea Crater. A previous geothermal hole drilled at Kahauale, much closer to Kilauea, had been buried in material from a nearby lava flow. Kilauea is the most continuously active volcano on the planet. The city of Honolulu is on the smaller island of Oahu.

The blowout on the 13th June 1991 resulted in, what was dutifully described as an "uncontrolled release" of steam. It took about half a day to cap it. Two workmen received minor injuries. This is probably about as bad as it can ever get at a geothermal plant. The blowout occurred because

huge quantities of steam were encountered at considerably less depth than was expected, which is actually a bonus. A piece of equipment prevented the automatic shutoff from operating and it had to be removed. Technically, it wasn't even a blowout; a blowout is actually a release that can't be easily capped. And the supposed blowout was water. However six households were near the area were told to evacuate "as a precaution". One wonders why it got so much media attention. One wonders why it got any. On the other hand a blowout at an oil or gas field or and "uncontrolled release" of oil or gas, can be very dangerous.

Oil inspired environmentalists inflate such incidents out of all proportion and in so doing initiate irrational and prohibitive safety and environmental regulations hindering geothermal power. And the oil companies win again.

A rainforest action group and an organization called the Pele Defense Fund oppose the whole concept of such geothermal power generation in Hawaii. They claimed geothermal energy anywhere on the Big Island is not safe. They have two additional, almost amusing claims. One is that a geothermal power plant will destroy the adjacent rainforest. The second is that the power generating unit itself will inevitably be buried in lava from the Kilauea Crater. How the rainforest and its biodiversity survive the expected lava flow is apparently irrelevant.

Members of the wealthy Greenpeace organization have boasted that Greenpeace is not interested in the facts when they decide to object to something, and neither it seems is the Pele Defense Fund.

At the time, a five hundred-megawatt geothermal plant was being proposed. That's enough generating capacity for three-quarters of a million people. As most of the people on the Hawaiian Islands live in and around Honolulu, on the island of Oahu, it would be necessary to connect that island with a two hundred mile (300 km) long submarine power cable. A US government funded feasibility study showed that such a cable could be laid and would be economically viable.

The design of the actual cable itself included an oil lining. This lining was a suitably and sufficient excuse for Greenpeace to oppose the whole concept. It claimed the cable might be cut by earthquakes or ocean currents and some oil might leak out. The hundreds of tanker loads of oil, constantly crossing the tropical Pacific to feed the oil burning power stations of Hawaii, Greenpeace never mentioned.

Submarine "power lines" are now regularly laid. These are not to supply electric power but to pipe millions of tons of oil and petroleum products across hundreds of miles of the sea floor. There is now a proposal to run a flexible submarine oil pipeline from Oman in the Middle East across the Northern Indian Ocean to India itself. This isn't a cable with an oil-impregnated sheathing. This is a cable that will contain millions of barrels of oil and present a genuine risk of major spillage. Protesters have been deafening in their silence on the environmental risks of this little exercise.

Greenpeace and the Pele Defense Fund seem to have been successful. All the power still comes from imported oil. It seems incredible that geothermal power generation is not the major electricity production system in the Hawaiian Islands.

For the oil industries, the objective must always be to hinder, frustrate, and so delay the planning process to the point where the whole geothermal scheme is stopped. And stopped well before it can even get started. As soon as large power plants are built and prove themselves both economically and environmentally, a major switch to extensive use of geothermal power will occur. Of course such a switch would have drastic effects on oil sales. And incidentally, it would massively reduce carbon dioxide emissions from the Fiftieth State.

STRATEGY 29

BIOFUELS ARE A MAJOR THREAT TO OIL AND GAS

Biofuel production is really a solar energy collection system. Solar energy is harvested by growing plants. The light energy is converted to chemical energy in the process. The chemicals

formed are large complex carbon-based molecules. We either burn the plant material to produce usable heat, or we process the plants to extract oils, sugars or starches. We then convert these extracts into a variety of liquid or gaseous fuels. Biofuel production is a grow, burn and regrow process. It is therefore carbon dioxide neutral.

Ethanol is the biofuel that soon must replace petrol (gasoline). It is already added to petrol in many states and territories around the world both to reduce pollution and to reduce critical dependency on oil. It must, and it will eventually be used as straight ethanol to completely eliminate petrol's massive contribution to Global Warming.

Ethanol has had a long association with petrol. Boeing B17 "Flying Fortress" bombers, fuelled with gasohol, (a mixture of gasoline and ethanol) operated very successfully out of North Queensland during the Second World War. As noted in Chapter 11: **ENERGY SYSTEMS WE USE NOW AND WHAT WE MUST USE TOMORROW**. The big aircraft engines ran cooler and their performance was enhanced.

Petrol sold in Queensland between 1929 and 1957 contained 10% ethanol. After that, almost inexplicably, some might feel, the production of ethanol for motor vehicles from Queensland sugar cane stopped. Undoubtedly the oil companies have recognized the threat of ethanol as an automotive fuel for at least half a century. Just recently the production of ethanol blends containing less than 10% ethanol has ceased being a crime in Australia. Selling petrol with above 10% ethanol content however is.

To produce one barrel of petrol requires about 1.2 barrels of crude oil. At times the Middle East nations manipulate the price of crude, forcing it up to well over $US40 a barrel. If we add to this the 20% excess needed to convert the crude to petrol, and not include any manufacturing or production

In 1952 the author established an Australian water ski jump record. Here shown practicing on the Hawkesbury River near Sydney. Ski boats can happily run on ethanol or ethanol blends and be safer to operate. The ski boat (now just out of the above picture) ran on petrol. At the time the cancerous spread of destabilized climates around the world resulting from fossil fuel use, was never even imagined.

costs, the raw material cost for petrol becomes $US48 a barrel. There are 160 litres in a standard barrel, so $48 a barrel is $0.30 per litre of crude, which is marginally more expensive than ethanol produced by an efficient fermentation facility. To the price of petrol must be added manufacturing, shipping and production costs. What also should be added, but never is, is the political and military costs to protect the oil supply systems.

It is not a coincidence that the world price of oil never seems to rise permanently above a price where ethanol from sugar would be comfortably cost competitive. World oil prices are periodically adjusted and keep this situation permanent. Petrol and ethanol are therefore both produced at a cost of around thirty US cents per litre. But unlike oil, ethanol costs can't be manipulated so as to destroy the competition and put them out of business.

Ultimately however, the biggest difference between cost of production and retail price is invariably due to national and local taxes. As a result there are few countries in the world where petrol is retailed for much less than seventy or eighty cents US per litre or about US$2.80 a US gallon.

The reality is that ethanol could easily be made cheaper than petrol at the service station and it could be accomplished with negligible modification to state or federal fuel taxes. Governments should not find it difficult to accept or even mandate a national switch to ethanol. But as we so often see governments can be influenced, and sadly, too easily.

In Australia a new anti-biofuel tactic has emerged. Here, an image is being created that endeavours to portray ethanol as some form of pollution risk and as an engine damaging substance. It is a subtle public relations and marketing campaign. Grave risks are carefully and subtly implied: an image is being sold that there is something "wrong" with ethanol as a motor vehicle fuels (in reality it's a better and safer fuel than gasoline). To this end a massive campaign was waged suggesting that ethanol will damage car engines. Senators and government ministers were coerced into legislating actual limits on the amount of ethanol that can be added to a fossil fuel. It was touted as a move to protect the engines in the family car. Utter rubbish. Legislation should have been introduced the other way round: limiting the amount of petrol that could be added to ethanol.

To illustrate how strongly these issue are forced into our thinking by the oil lobby consider the comparison with LPG. Fuel companies often add special lubricants and additives to petrol to "prevent wear and enhance engine performance". This is easy with both petrol and ethanol, as both are liquids. With LPG, a fossil fuel product, this is not so easy. LPG becomes a gas before entering the engine and these previously much publicized special lubricants cannot be incorporated into a gas. Politicians were conspicuous by their absence in any endeavour to protect the family car from wear caused by switching to LPG. This moralistic juggling and behind the scenes influence of the fossil fuel lobby on government is frightening.

Also in Australia, an interesting situation arose at the beginning of the millennium. The federal government was not applying a fuel excise to ethanol. Consequently fuel vendors would buy ethanol and add it to their petrol, thus avoiding a proportion of the fuel excise and so increasing their margins. They couldn't advertise, because if caught, they could be prosecuted for avoiding fuel excise taxes. The cars still ran fine, the vendor made more money and the environment benefited. The oil companies didn't like it at all but so convenient for them, it was against the law. The Australian Government was made to dutifully crack down on such "tax cheats". But who won – certainly not the environment? It was the oil producers as always that really benefited by the crackdowns.

Some of the ethanol was being imported from Brazil. The Australian Federal Government was coerced into imposing a tariff on imported ethanol. The so nobly stated intention was to assist Australian sugar-ethanol production. This new tariff should never have happened. A subsidy should have been paid to local sugar producers instead. This would have encouraged, and not discouraged a change to

ethanol-based motor vehicle fuels. Australia and the world would have benefited.

Then two years later the world price of sugar collapsed. (I know of no investigation as to how or why this happened, but surely it should be worthy of some investigation.) Australian sugar farmers are efficient and internationally competitive in a free market situation. Nevertheless they were hit hard. The Australian Federal Government then, in an incredible display of either naïvety, gullibility or blatant cronyism, stepped in and decided to "assist" Australian sugar farmers to vacate the industry and stop producing sugar. They would give them an assistance bonus to sell up and go. To fund this so-called assistance package a levy was dreamed up and applied as a tax on the price of sugar at consumer outlets. The benefit of all this to the oil companies was remarkable. The final effect is that the Australian consumer is paying a tax at the supermarket to assist Australian sugar and ethanol producers to self-destruct.

It is accepted by all that petrol use increases the nett carbon dioxide level in the atmosphere and ethanol use doesn't. Yet the environmental protection bureaucracies and the industries that so often support them, call for further "studies" on ethanol use in motor vehicles. Simultaneously they both studiously avoid realistic Global Warming considerations. These people are dangerously clever and frighteningly manipulative. They must somehow imagine that ethanol fuelled Brazil doesn't exist. Brazil runs on ethanol. Brazil is the biggest producers of sugar cane and ethanol of any nation in the world. All the major car companies with branches in Brazil manufacture cars that run perfectly on straight ethanol and or ethanol blends. By the 1990s there were over four million cars in Brazil operating on straight ethanol. See Chapter 11: **ENERGY SYSTEMS WE USE NOW AND WHAT WE MUST USE TOMORROW.**

Ethanol blends are now almost universally available in the US. Ethanol blends are promoted there by the fuel companies because of their better performance characteristics – most definitely not for their greenhouse reducing characteristics. Undoubtedly, to the unwitting chagrin of the US oil lobby, the United States Clean Air Amendment Bill of 1990, actually nominated ethanol as a "clean fuel".

There is a twist however. Ethanol in the US is made from corn and this is encouraged. The much cheaper production of ethanol from sugar cane is not encouraged.

Biodiesel gets the same treatment. It is the obvious objective of the fossil fuel interests to avert the commercialization of biofuels anywhere it might occur. Biodiesel was trialled in the UK. The fuel quality proved to be excellent, but not so the politics. For example: rape seed oil modified into its rape-methyl-ester form (RME) was given a comprehensive trial by Reading Bus, a local commuter transport company. Canola oil is another name for rapeseed oil and RME is the biodiesel produced from this oil.

The rapeseed oil was imported from Italy and so fuel duty was dutifully imposed on the imported oil. As a result, the biodiesel cost the company about twice the price of the diesel fuel it replaced. Unfortunately because of the colder UK weather the locally grown oil is more expensive. Technically it is true that much of the imposed duty could have been claimed back. But such claims involve compliance with tortuous government regulations that make claim processes almost hopeless.

The buses ran well on the biodiesel. Drivers reported they started well, had no breakdowns, and produced less smoke. The fuel was as good as, or better than diesel.

Because of the lack of government support, and what seems to have been actual government hindrance, and because of immense bureaucratic compliance requirements, the buses in Reading were forced back to operating on diesel.

The United Kingdom Department of Transport then decided to try for a win both ways. It offered large grants to local authorities to try various other fuels to reduce consumption and pollution. This initiative was obviously designed to appease concerned environmentalists. That sounded all right, but at almost the same time the department said that preferences for the allocation of grants would be directed to trials involving compressed

natural gas, LPG and electrically powered vehicles. The use of biofuels would not be a preferred option as, "the role of alternative fuels has not been fully thought through."

This effective elimination of biofuels would naturally appease the fossil fuel lobby and give the Department of Transport a rather unsavoury and sick double win; certainly it was a win for the oil companies.

The whole range of biofuels pose a very significant threat to the sales of fossil carbon materials. They are a most competitive transport energy source, and the fossil fuel lobbies are understandably determined to manipulate against them and suppress their general adoption.

STRATEGY 30

WIND ENERGY AS A THREAT TO FOSSIL FUELS

Wind energy is a very viable source of commercial electricity and the cost of the electricity produced is reasonably competitive with that from fossil sources.

Wind energy is similar to tidal energy in that it is limited to quite unique geographical areas and localized topographical forms. Nevertheless, oil companies would be remiss if they did not treat wind energy as a significant threat deserving of well-planned public image manipulation. So a bad image of wind energy had to be created.

Wind energy has been utilized by man since well before the beginning of recorded history. Probably its first use was to power sailing vessels with sails of woven reeds. Millennia later, the water wheel and the windmill were invented. Rotary motion and primitive gear wheels meant man and beast were no longer the sole source of useful energy. Windmills and water wheels became part of the very fabric of man's history. The old windmills that ground, or milled our flour for bread making were colourful and attractive. They are part of the heritage of human society.

It is not easy to destroy such an image, but destroyed, it must be. Otherwise, modern technologies could turn a new generation of the old windmills into a threat to the purveyors of fossil carbon.

There are many localities where the wind is consistently strong and blows in a reasonably constant direction for the greater part of the year. And these of course are the places where wind energy becomes most competitive. However, every pulse of electricity, every watt of power that comes from a wind turbine, represents a loss in sales of coal or oil or gas. When a wind turbine installation is being considered some place, inevitably some fossil fuel company or country, somewhere, is going to lose sales. The well-oiled public relations machinery is put into top gear.

For the fossil fuel lobby, combating wind energy becomes just another part of the ongoing war against alternative fuels. An article in a prestigious journal discusses wind farms and expresses doubt whether they should really be considered as a "green" alternative energy source at all. It blithely states that wind turbines are not compatible with many other land uses "such as housing or airports".

That's ridiculous. It could just as logically be rephrased, and argued that wind turbines are in fact compatible with all forms of land use, and more so than airports and housing.

The article also states that wind turbines have an "impact on the environment" as they are "noisy and unsightly". (A current catch phrase that presumes any impact on any environment as being bad.) The same article does, incidentally, concede that at a distance greater than 1,000 feet (300 m) their noise level corresponds to that inside a public library.

However the message is forced through and a negative image for wind power slowly becomes established in the public mind.

I believe that wind generating towers and their turbines are wonderful examples of brilliant engineering with beautiful and functional design. If we are to judge wind turbines as ugly then we can never feel proud of any of our achievements. Invention, construction, and even artistic design will all be sacrificed on an altar of environmental stagnation.

The common claim that wind farms take up a lot of area uses some twisted logic to justify. The land area a turbine really uses is no more than the base on which it rests, and that's about the same as the base area of one conventional power transmission line tower, the same towers that crisscross and span our countries from end to end.

Wind energy, like solar energy, needs an area less than one percent of the land area we need to feed ourselves, and when all things are added they both invariably use less total land area than a conventional coal-fired power system of the same power output.

We are also being conditioned to believe that wind turbine blades kill flocks of birds. Don't believe it. The Dutch Institute of Nature Conservation and The British Royal Society for the Protection of Birds both concede that wind turbines have little affect on bird life. Modern high-capacity wind turbines have blades that turn one complete revolution in about three seconds. The diameter of a large wind turbine might be 130 feet (40 m), which means the very outer tip of the blade travels at around 95 mph (150 kph). Birds can dodge such things quite well. If they are not birds of prey themselves then they have learnt how to dodge them. Birds are good pilots. I fly myself and birds easily dodge light aircraft that travel at similar speeds to wind turbine blades. The turbine blades are stuck on their tower in one fixed locality and even the silliest birds soon learn to avoid them.

California has the most wind turbines. Denmark, coming second, has about three thousand. This is encouraging. However like all renewable energy projects, Danish wind farms ran into tremendous problems from government and bureaucracy in getting them approved and having them built.

Many of the new wind turbines coming on line will be built in shallow water, one or two miles out to sea. This has several advantages. Wind speeds are higher and more consistent away from the coast, and the builders and operators are not subject to orchestrated complaints of being "unsightly and noisy".

Generating costs of these new turbines can be less than $0.10 per kilowatt-hour, a perfectly acceptable power cost for a modern industrial society and automatically a significant threat to the fossil fuel producers. Efficient installations in ideal locations can produce power at costs as low as three cents per kilowatt-hour.

STRATEGY 31

THE HANDLING OF SOLAR ENERGY

There are two fundamentally different systems for the mechanical production of electricity from sunlight. The first uses "photovoltaic cells" or "solar cells" that produce electricity direct from sunlight.

The second, called "solar thermal", focuses concentrated sunlight onto a pipe target. By various means this concentrated heat is then used to produce superheated steam to drive conventional steam turbines.

We've all seen solar cells. They receive a lot of publicity. Solar cell systems are inherently expensive and are not currently seen as a serious threat to fossil fuel generated power. So it's OK for the oil companies to foster them, and in so doing be seen to be green. This they duly do.

Not so with the emerging variety of solar thermal concepts and designs that might come on line. These, the coal, oil and gas producers cannot ignore. To date the only image their PR people promote is to claim that solar power stations require enormous areas of valuable land. But this is a nonsense. In any Western society, or in any other advanced affluent society, on average a citizen uses about an acre, say half a hectare of land, to grow their food. Using solar thermal technology, each would need just 275 sq ft or 25 square metres allocated to generate solar power. That area would be sufficient for twenty-four hour operation, with suitable energy storage.

Solar power stations also work best in dry cloudless conditions – not in good farming country where it is desired that rainfall be ample and regular. The land requirements argument is nonsense. The land area for solar power is less

than three-quarters of one percent of the land area for food, cotton and wool.

The fossil carbon energy people with their current appreciation of the impracticality of solar voltaics have only recently begun to comprehend the potential of low cost solar thermal power. With the generation of electricity from nuclear energy being systematically turned into a socially unacceptable power alternative, solar thermal power begins to loom as the most likely major threat to fossil carbon fuels. It is in the best interests of the oil, coal and natural gas industries to try and stop solar thermal power from ever getting a free run. If a solar power station gets going they want it out of business as soon as possible.

In 1979 LUZ International Limited was formed to produce and operate commercial solar thermal power stations. The group built a series of power stations in the Mojave Desert in Southern California. The plants have a combined generating capacity of 354 megawatts, enough to supply the power requirements of a city of 400,000 people. The power is distributed through the utility company, Southern California Edison. The LUZ plants are also equipped with natural gas fired boosters to maintain optimum steam temperatures and efficiencies. By a considerable margin, these plants in California produce many times more solar thermal electricity than is produced in the rest of the world combined.

Californians know about smog and air pollution and are prepared to pay a little more for their energy to beat the problem. Los Angeles was once the smog capital of the world, but things are improving there. European cities on the other hand are deteriorating fast, with some areas in Western Europe now making Los Angeles look pristine by comparison. The LUZ plants in Southern California are helping.

A United States law, passed to assist alternative energy initiatives required utility companies to buy electricity from non-polluting alternative energy sources when available. In addition the Federal Energy Regulatory Commission (FERC), recognizing the necessity for supplementary heat input to cater for variations in solar flux, allows a 25% input of fossil fuel energy while still qualifying all the output as alternative energy. Most of the generating equipment could thus be operated overnight and so reduce the cost of servicing the initial capital.

The law also said that the price the distributing companies buying the wholesale power must pay, must equal the highest peak load price they paid to any conventional supplier they purchased power from. On face value the law was well designed and worked well for a period. But the concept had a flaw.

As the incentive started to take affect and alternative energy generation increased, the fossil fuel companies undoubtedly got nervous.

So what happened? The LUZ power station set up, with something like 180 acres of collecting mirrors, was selling its power at a price based on expensive natural gas fired generating facilities serving Southern California Edison. Solar power was thus starting to get a foothold in the market place. Then a weakness in the Luz financial structure was discovered and utilized. The gas companies slashed the cost of their gas and the wholesale cost of electricity plummeted. In consequence the support price for alternative energy crashed and so did the alternative energy solar electric company. In consequence Luz International Limited could not go ahead with their next project, listed as SEGS-10. SEGS-10 would have generated another 80 megawatts of power, sufficient for the daytime requirements of a city of more than 100,000 people.

The total, all up land area of that proposed plant near Barstow was to have been 416 acres (168 ha). That's only 180 square feet (17 square metres) per person. Western man uses at least two hundred times as much land for food. So, contrary to what is always inferred, LUZ technology proved solar land area requirements are actually tiny.

Solar panels, solar cells or photovoltaic cells, (the terms are interchangeable) are the solar systems that always manage to generate considerable publicity. The marketing by some oil companies of the, to them, totally unthreatening

concept of solar cells is brilliant. The across Australia, long distance "solar race" is a good example of their well-structured support.

But the facts are that photovoltaics generate very little power per dollar spent. Photovoltaics also manages to get something like ten to twenty times the overall publicity and general media coverage as does solar thermal concepts, yet solar thermal is already vastly cheaper and more efficient. Government funding constantly and very selectively supports photovoltaics, not solar thermal. Funds and assistance packages are structured so that solar thermal power generating systems never qualify for anything. It is insane that photovoltaics consistently receive anything up to a thousand times more government funding and research backing than solar thermal concepts. Is that really just accidental?

Purely for political reasons, governments have to display an interest in alternative energy systems, but most government funding for alternative energy is conveniently channelled away from realistic solar thermal development into expensive and exotic projects like deuterium hot fusion research. For the fossil fuel industries, deuterium hot fusion research is undoubtedly the most unlikely to work and the least threatening alternative energy and nuclear energy system on anybody's horizon. For the grinning oil producers, these projects conveniently drain away alternative energy research dollars like water from a kitchen sink.

STRATEGY 32

DESTROYING THE NUCLEAR ENERGY INDUSTRY

The all-electric car and the high output hydrogen fuel cell have to be based on non-fossil fuel energy sources for them to be sensible concepts. The electricity will be either generated "on board" using hydrogen fuel cells or it will be stored in electrochemical batteries. In either case the original energy has to be produced at non-fossil fuel power stations.

The stark reality is that nuclear energy is the only energy source that can supply the huge quantities of energy needed to power any self-contained electrical transport systems. The oil producers understand that, so they see nuclear energy as an enormous threat to their continuing sales of gasoline, diesel and LPG.

Surprisingly, the oil producers have actually brainwashed themselves into believing that sugar cane and oil seed production are absolutely reliant on the chemical fertilizers they themselves manufacture. Using petrochemical fertilizers to grow sugar or vegetable oils, they reason, inherently negates the zero emission advantage of biofuels. At least this is their argument. Therefore, to them, only nuclear generated electricity is left as an all-encompassing threat to petroleum based fuels.

Therefore, for the fossil fuel industries, the objective has been and must be to generate in the minds of the general public intense fear of all forms of nuclear energy and nuclear radiation. They must constantly argue the nonsense that the natural background radiation that has bathed the planet since before life first formed, is deadly to the life that actually evolved in it. The fossil fuel lobby continue to claim that all forms of radiation, in even the tiniest of doses will kill, and thus all radiation must be avoided.

The oil producers must also create a general belief that the disposal of nuclear waste is an actual problem. Then they must follow up with invented arguments against every proposed disposal system.

The oil producers must always link nuclear generated electricity with nuclear weapons. They, of course, must keep under wraps the logical and parallel argument that all conventional explosives and all chemical weapons are petroleum based.

Understanding how the truth about nuclear energy has been manipulated by the fossil fuel industries is frightening. But such massive manipulations have been done before. Maybe they slavishly copied an evil teacher in any endeavour to prove again that:

"The great masses of the people…will more easily fall victims to a big lie than to a small one." Adolf Hitler, from *Mein Kampf* 1925.

The systematic destruction of the nuclear energy industry and the consequential ramifications are of vital concern in our efforts to prevent total climatic destabilization. Chapter 10: **THE SABOTAGING OF NUCLEAR ENERGY** has been devoted entirely to this incredible story.

STRATEGY 33

RIDICULING THE NUCLEAR COLD FUSION CONCEPT

Cold fusion is one of those strange and incredible concepts that, just possibly, could put nuclear powered engines under the bonnets of cars. On face value, how research on such an important issue could be stopped seems difficult to imagine. Research costs for cold fusion are not the billions involved in hot fusion energy research. They are way down in the millions or even thousands of dollars range.

What can the oil companies do? It might be possible to suggest the threat of atomic bombs in every car on the freeway. It might then be possible to put a blanket ban on all cold fusion research because of this hypothetical threat.

Unfortunately for the oil-marketing gurus this would be too difficult to implement globally. Many countries – Japan being typical – are frighteningly dependant on imported energy. If there is any chance of the process working, then these countries are not going to let cold fusion just go away. For oil marketing then, at least wherever possible, the concept should be ridiculed. It can possibly be portrayed as some giant scam. In this way, participating research personnel could be made to look ludicrous. All of the claims of successful cold fusion to date may well have been scams, for that is what we are consistently told. Maybe true, but more likely and more charitably they were sincere mistakes. But that's what research and development is all about.

There are theoretical bases for a variety of cold fusion concepts so at least we should keep an open mind and keep looking. Who knows? Perhaps the scams have been intentionally promoted to ensure that all forms of cold fusion research become tarred with the same brush.

The oil companies' public relations and advertising people have to carefully monitor their "problem" of cold fusion.

The whole concept of cold fusion however, is a big if. In the short-term we most certainly can't expect it to be a contributing factor in our immediate need to prevent runaway Global Warming.

Research on cold fusion is not inherently expensive whereas, in complete contrast, hot fusion is a bottomless money sinkhole. Hot fusion is the process used in the hydrogen bomb and a practical system for generating electricity using hot fusion energy is a long way off. Temperatures in the millions of degrees, and enormous pressures coupled in incredibly expensive and exotic configurations are required to produce a hot fusion effect even in laboratories. From the oil companies' point of view, if research money has to be spent on nuclear energy, then it should all be allocated to the most unlikely, impractical, and expensive, branch of nuclear study possible. Which is of course hot fusion power generation.

Hydrogen bombs can be made thousands of times more deadly than atomic bombs. What happened to the antinuclear movement that made them so supportive of hot fusion? Should they not ponder the wisdom of spending billions researching a branch of science that may one day lead to super simple super bombs. Hot fusion research is a track leading to discoveries with utterly unknown and frightening consequences. And it's not needed.

STRATEGY 34

SUPPORTING SUBSIDIZED AGRICULTURE AND REDUCED AGRICULTURAL LAND AREA TO SELL AGROCHEMICALS

Reducing the quantity of available agricultural land results in higher land prices and more intensive farming. This makes chemically dependent agriculture very much more saleable, affordable and justifiable.

The food market is limited by the actual requirements of the consumers, whereas the agricultural chemical market is only limited by the skill and daring of the marketers themselves. Every season, every acre can receive either a spoonful or a truckload of such chemicals. Manipulated agricultural laws, juggled agricultural subsidies, the infusion of a pro-chemical bias into agricultural research, intense lobbying and misleading advertising, all determine whether it be a truckload or a spoonful. In consequence and to ensure the expanding sales of agricultural chemicals, the worldwide manipulation of agriculturally related laws has developed into an insidious art form.

An extremely favourable structure for the agrochemical companies has been established for limiting agricultural production in most Western nations. Artificially high prices for food, especially grain, are determined by individual national governments. Government agencies are then established and funded to purchase the inevitable overproduction that is in turn often dumped at artificially low prices on world markets.

In the United States, these high prices were established following World War II. Originally, the idea was to stimulate US food production to feed and restore a battered world. The world recovered, but the subsidized pricing structures remained. An enormous sociological, agricultural mess was created. There are now thousands of US farms that are simply too small to survive in any normal and sensible free market situation.

The concept and the cancer of subsidized agriculture spread, and the value of agricultural produce and agricultural land became progressively distorted throughout the world. Of course, all these additional farmers have their political influence, so artificially high prices became easy to maintain.

In Europe non-viable farms, supported by artificially high prices for agricultural produce eventually became the norm. The same huge food stockpiles grew and grew, until they finally became a huge embarrassment. What to do? If the food is allowed to simply deteriorate and rot, the issue becomes a public scandal. That is why oversupplies are sold, or "dumped", on international markets at artificially low prices.

The political reasons for distorting world markets in this manner vary according to the current political agenda and national interests. But mostly the relevant governments simply don't understand and don't appreciate that there may well be a rather unhealthy logic to such dumping. For it is automatic that such dumping puts pressure on un-subsidized, more efficient, non-chemical-using farmers in other countries and puts them out of business.

One solution. Huge quantities of overproduction food could simply be given to the millions of starving people throughout the world. This might ensure continuing and possibly increasing sales of agrochemical products. However, giving food away as a long-term option has never been particularly successful for any government. It was practiced in ancient Rome and it didn't succeed. It doesn't today. Won't we ever learn? Large-scale gifts of food creates enormous moral, monetary, criminal and political repercussions. The food is inevitably acquired by the current local power junta and pseudo-legal black markets are soon established. Donating governments are also rarely benignly generous and their food aid is invariably linked to subsidized, chemically based home agricultural production.

Food self-sufficiency in Third World countries is best achieved by the progressive mechanization of independent, but initially only subsistence-level farms. It is also more efficient, more logical and more productive and therefore essential for farmers to have clear and legal title to their land. That is how they can finance their tractors.

These farms improve dramatically and prosper when their labour efficiency improves with mechanization. They also prosper dramatically as they work to increase the fertility of their soils. Such small farms cannot afford to waste money on agrochemicals, and don't. Especially if those chemicals destroy the very fertility they are trying to enhance.

Such concepts have negligible appeal for

agrochemical sales people.

Agrochemical companies know that if aid is to be given to Third World countries it is in their interest to ensure that the aid be directed to some administrative government agency, or alternatively to large government controlled farms. They know that aid must never go to small independent free thinking farmers. They know that administrations can be manipulated and "collective" farms can be coerced into becoming huge markets for agrochemical products. Of course part of this process is that "technical advisers" must always be part of the aid package. And for "technical advisers" always read "agrochemical salesmen".

The population of the world is now considered by many to be increasing faster than the increase in world food production. The Malthusian theory that predicts we will breed ourselves into international famine has strong support.

The believed perception that worldwide starvation is now inevitable, was argued by Lester Brown back in 1990 in the "State Of The World" report issued by the World Watch Institute in Washington DC. Lester Brown, who headed up the institute, is an agronomist and his report noted that while food yields grew at a rate of 3% a year between 1950 and 1984, and thus increased average individual food availability, the trend has now reversed. At the end of the 1980s the rise in food production had dropped to 1% per year (possibly as soil fertility levels slowly declined). But population projections were 1.7% per year.

At the same time, Western nations always claim to have excess food production capacity as, it is argued, agricultural land, supposedly still usable for food production, has been "set aside". However, Brown states that the reality is that the land was taken out of production because of depletion in soil fertility, which is in turn causing widespread erosion. The 1985 United States Farm Bill and the 1985 Food Security Act legislated a reduction in available cropland area throughout the US by a massive 11% over the following five years. Very conveniently for the agrochemical companies, the legislation placed no limits at all on actual volume of production. Later legislation consistently maintained these conveniently structured influences on US agriculture.

The same fertilizer-induced agricultural mistakes are also being made in countries like China and the old Soviet Union states, all with "copy cat" agricultural administrators. The report from the World Watch Institute, almost by accident, highlighted frightening emerging world food production manipulations.

Today a well-managed, well-orchestrated script promotes production of food using massive quantities of agricultural chemicals. That same manipulative script also attacks organic food and organic food production techniques with never-ending criticism. This is usually in combination with the manipulative creation of frustrating and prohibitive legislation.

Western Nations that subsidize food production eventually reach a point where total production has to be limited, or embarrassing surpluses develop. So, on one hand we have increasing world starvation and on the other artificially limited agricultural land areas.

Bizarre? Yes it is. But it gets even more bizarre.

As was pointed out in Chapter 6 and Chapter 8, if government agencies imposed a limit on the actual quantity of food at the subsidized price, then total subsidized production could be easily and conveniently regulated. That makes sense. But it's not how it happens. For the agrochemical industry such a limitation would be most unfortunate. They need agricultural land area restricted. It is obvious that whatever form of limitation is imposed, farmers will adapt. But if food quantity is limited specifically and not land area, then farmers will, as always endeavour to produce food in the most cost-effective manner. Expensive chemical inputs would thus be the first thing to avoid. The totally beneficial and cost-free concept of increasing soil fertility would suddenly be a logical scenario. The scenario would be adopted by farmers everywhere. Wise crop rotation would also become the norm.

This is not the way to sell agricultural chemicals. Fertilizer sales would slump. Worse, healthy plants do not need pesticides. Crop rotation

would negate the need for fungicides. It would be a disaster. For the agrochemical-petrochemical industries there had to be another way. So that is why a limit is never placed on the total quantity of food that can be produced and be eligible for a price subsidy. That is why the limit is placed instead on the specific area of land on which the legally subsidized crop can be grown.

Thus, within the food price procurement structure the limit on the quantity of chemical stimulants used in crop production is only reached when the cost of chemical inputs ultimately exceeds the increase in crop mass..

Of course, the concept requires an army of bureaucrats to enforce. This naturally suits the inevitable empire-building ethos within the particular government agencies intended to administer agriculture. They therefore become allies of the chemical industries. It is obviously a cumbersome and unwieldy system, but from the point of view of the petrochemical industry, the advantages are mind-boggling.

United States agricultural products and most European agricultural products are still subsidized in this manner. And the money paid out is still based on unlimited quantity of crop, produced off strictly limited areas of land. This form of subsidized agriculture does not subsidize the nation's farmers. It subsidizes the producers of agricultural chemicals. And in so doing, it actually funds the destruction of a nation's topsoil and effectively funds the escalation of Global Warming.

STRATEGY 35

CREATING THE IMPRESSION OF GIANT WILDERNESS AREAS THAT NEVER EXISTED

Enforcing intensive agriculture is the agrochemical companies' most assured method of massively increasing the sales of their chemicals and fertilizers. They therefore support agricultural land being taken out of circulation. The creation of enormous wilderness areas, bigger than some individual nations, can tie up future agricultural land on a grander scale and with more assured permanence than almost any other process or ploy known to agrochemical companies and their public relations gurus.

All that is required is that somewhere, within these potential giant land grabs, some "prime example of the wonders of our planet" can be claimed to exist. The PR people then fund some suitably bankrupt green movement to supply protesters. Send a good camera crew out with them to shoot footage on some attractive and photogenic location, and with the help of suitably manipulated television coverage, a million acres can be tied up forever. In addition, if they so choose, the sponsoring oil company can be seen as displaying "commendable corporate responsibility".

Often these good photogenic locations are so hidden in the vastness of these immense land grabs that they are often impossible for a visitor to locate. Generally the tax funded custodians of any beauty spots feel they have to keep them that way. They therefore want visitors to keep out. But if beauty is "in the eye of the beholder", where then is the beauty if there is no one permitted to behold it? Tomorrow's generation will themselves have another "tomorrow's generation" so they too must be kept out by another crop of custodians for distant "future generations".

We should also be aware that already more than two-thirds of the land area of this planet is either defined, or generally considered as wilderness. Why do we need more? We must also remember that over the last fifty thousand years virtually all the habitable landmasses of this planet have been occupied by man. Every wilderness area on this planet over those fifty thousand years is now man-made either by cultivation and animal management, but primarily by the use of fire. If any habitable area on this world is not already totally man-made, it is at least influenced in a major way by human habitation.

An entire ice age has come and gone during the long period of man's influence on the ecology of the planet. Some of man's influence has been good, some bad, but nowhere does true pre-human wilderness exist, except only in the deserts

of never-ending wind and sand, and in the deserts of never-ending snow and ice.

What then are wilderness societies trying to preserve as they strive to lock up massive chunks of the planet's surface? Maybe they are just bored, looking for a new interest? Or are they just the non-thinking front line troops of the petrochemical industries, the green pawns of the fossil fuel lobbyists?

We obviously need intelligent decisions as to how much of our land surface needs to be preserved as wilderness parks, and where and what those areas should be. However it is silly to presume that a wilderness has unique value simply because it is currently defined as a wilderness. Look up wilderness in the dictionary – it does not say wilderness is in any way something special or worthwhile, and mostly it's not.

So maybe something could be unique? We should remember most things and most places anywhere are in some ways "unique" – or one of a kind. But something unique in my dictionary also means "very remarkable". If it is not very remarkable and we change it, in all probability it will be just a different "unique". But irrespective of such hypothetical considerations, right now, for better or for worse such decisions must be determined by their effect on Global Warming. We have very little time available.

Of course, prime examples of extremely unusual geological structures or biological strangeness often require government legislation to ensure their survival. And their survival we should ensure. We must preserve our awareness, our knowledge, and our potential knowledge of the wealth and fascination of unusual ecological systems and mystifying natural environments. However the weight of wisdom and fascination, not the volume of noise, should be the deciding factor in determining uniqueness.

Land is used by animals and man simply because it is usable. Land never stays vacant. Unless it's snow or ice or desert sand. Uninhabited land inevitably and quickly becomes inhabited by something. Good fertile land, good fertile soil, is only fertile because life moved there and made it so. And almost invariably man followed and became just another occupant. That's what the world's wilderness areas are, and have been for at least the last fifty millennia.

The often used manipulative ploy of justifying the establishment of outlandishly vast wilderness areas by promulgating the concept of some dangerous massive loss in world biodiversity is considered in Strategy 50.

STRATEGY 36

CLAIMING WORLD AGRICULTURE CANNOT PRODUCE ENOUGH FOOD WITHOUT THE USE OF FERTILIZERS

There have been large increases in the weight of crops produced per acre in the last fifty years. Most farmers acknowledge that the majority of these increases result from the development of faster growing and more prolific plant varieties. The agrochemical companies have to confuse and convince government agencies and the consumers of agricultural products, that this is not so. They claim it's chemicals that are responsible, and the ploy is working. Agricultural chemicals have gotten the image as the saviour in solving world food shortages.

Among the non-farming population it has now almost come to be "general knowledge" that increases in world food production result almost exclusively from vast increases in the use of chemical fertilizers and agrochemical products. These established fictions then ensure receptive minds in legislators.

The ultimate object of the agrochemical industries must be to coat every agricultural acre of land on the planet with a dose of some agrochemical product. And do it at least once every year. Strawberries grown in California are an extreme example. A few years ago, my wife and I were talking to some strawberry farmers in Southern California. They told us two things. The first was that it is fairly common in the growing of strawberries to dose the plant and the soil with

The Esalen Institute, Big Sur, California *periodically donates its facilities and convenes conferences, or think tanks of selected top people in particular fields. The objective is to have such people meet, intermingle, bounce ideas around and hopefully to generate new ideas and concepts. From time to time great good has come from these initiatives.*

In 1989 the Institute was made available for a think tank on the future of sustainable agriculture in the United States. A small group of leading thinkers from all over the US were invited to a five-day conference. The author, was invited over from Australia.

One of the outcomes was the formulation of a declaration on sustainable agriculture for the United States.

Immediately following the Esalen get-together there was a large conference at the **Asilomar Conference Center, Pacific Grove, Monterey Peninsula, California**. *This conference was organized by the Committee for Sustainable Agriculture (now The Ecological Farming Association) and was attended by over 1,000 people*

At the Asilomar conference the declaration on sustainable agriculture was presented, considered and subsequently adopted as the Asilomar Declaration On Sustainable Agriculture.

The author's concept of stopping Global Warming by changing Western agricultural practices to systems based on a continuous increase in soil organic matter to halt Global Warming was the theme he advocated at Esalen and at his opening address at the Asilomar conference.

Attendees at the Esalen Institute conference.

Front row:- From left to right **Amory Lovins**, *Rocky Mountain Inst., Snowmass, Colarado,* **Terry Gips**, *Int. Alliance for Sus. Ag. Minneapolis, Minnesota,* **Richard Nilsen**, *Whole Earth Review, Sausalito, CA.,* **Bob Rodale**, *Rodale Institute, Emmaus, Pennsylvania,* **Kaye Thornely**, *Molino Creek Farm, Davenport,CA.,*

2nd row:- from left to right **Chris Yeomans**, **Allan Yeomans**, *Gold Coast, Queensland. Australia,* **Eliot Coleman**, *Working Land Fund, Vershire, Vermont,* **Steve Gliessman**, *UCSC Agroecology Program, Santa Cruz, CA.,* **Kevin Martin**, *Nat.Org.Grown Week, San Francisco, CA.*

3rd Row:- from left to right **Steve Beck**, *Esalen Institute, Big Sur, California.* **Jane Mulder**, *Organic Food Matters, Colfax, CA.,* **Molly Penberth**, *CSA Board President, Sacramento,CA.,* **Diane Goodman**, *Farallones Institute Occidental, San Francisco, California,* **Wes Jackson**, *The Land Institute, Salina, Kansas.*

Back Row:- from left to right **John Reganold**, *Wash.State University, Dept of Agron. Pullman WA.,* **James S. Turner**, *Healthy Harvest, Washington, DC.,* **Bill Leibhart**, *UCD Sus Ag and Research Prog., Davis, CA.,* **Steve Pavich**, *Pavich Family Farms, Delano, California.,* **Conn Nugent**, *Nathan Cummings Foundation, New York, New York,* **Ron Kroese**, *Land Stewardship Project, Marine, Minnesota.*

up to forty applications of a range of fertilizers, herbicides, pesticides and fungicides every year. The second thing these Californian strawberry farmers told us was that they would never eat strawberries grown commercially in California.

The agricultural chemical business is a very big business indeed; and it's the intention of the agrochemical companies to keep it that way.

The concept that the quantity of food produced from organic farms must always be less than that produced by chemical based farming is totally false. Food production per acre from organic farms as often as not considerably exceeds food production from neighboring conventional farms.

Admittedly, during the two or three year process of converting a farm from chemical based agriculture to strict organic defined agriculture, total food production can fall, but falls are rarely more than 25%. This period of reduced income could easily be avoided if the excessively rigid definition of "organic" was tempered slightly making the produce more marketable. Or as a complete alternative, certification of food produce could be based on increasing carbon dioxide sequestration into the soil in which the produce is grown. Buyers would see a label that showed the product was combating Global Warming and make a purchase decision accordingly.

Changing to organic management allows previously used agricultural chemicals to be broken down or leach away within a couple of seasons. Vigorous soil biological activity will concurrently re-establish itself. Worm counts will begin to rise – often from zero. The soil re-mineralization process will commence. Generally within two to three years full productivity, usually higher than before, will become established. At that point a specifically "organic" certification can be applied for if desired. But certification and product labelling for changing to general Global Warming mitigating practices should be available immediately the switch is made.

Over the last few decades the agrochemical industry has been quite successful in hindering or limiting the number of studies on organic farming production. The information that is available does however, conclusively confirm the total viability and reliability of organic type farming as a food source system. The research and the published scientific papers relating to this research are usually confined to relatively obscure scientific publications. It is to the petrochemical industries' advantage to utilize their advertising and commercial influence on editorial to maintain this subtle form of censorship.

Almost unique in Western nations, Australian farmers, since the late 1940s, have, on average increased their agricultural productivity most significantly. This increase in productivity has been achieved by the widespread adoption of crop and pasture rotation, coupled with a general switch to the use of non-inversion tillage practices that benefit soil biological activity. I am not alone in attributing much of this change to my father's work and discoveries. All his books on Keyline agricultural concepts were best sellers in this country. Coupled with the widespread adoption of the many facets of Keyline, the utilizing of new plant varieties and hybrids has also been a major factor. Most importantly the change has been achieved without any significant increase in the always relatively low use of agricultural chemicals.

No other Western Nation uses so little chemicals to produce so much food. This is well documented in *World Resources*, a World Resources Institute report published in conjunction with the UN Environment Programme and the UN Development Programme. This productivity occurs despite the fact that Australian soils, on average, are the poorest natural soils occurring on any continent on the face of the Earth.

Australian soils, on average, are constantly increasing in fertility, despite what the Australian academic bureaucracy claims. In many ways Australia is probably the only Western Nation operating an entirely sustainable agricultural system. I am utterly certain that this in part resulted from a history of almost total lack of agricultural subsidization of, and bureaucratic interference in Australian farming practices.

However, to sell agricultural chemicals the Australian experience must be derided. Australian

farmers must be portrayed as irresponsible, negligent, and totally neglectful of the land and the soil they farm. Not so. The false and deliberately manufactured image that Australian farmers are irresponsible and destructive towards the land they own and farm, is regrettably becoming increasingly established in urban thinking. That is so very wrong. In general, Australian soils, managed by Australian farmers and graziers, are the only agricultural soils in the world being constantly improved en masse.

To gain increased agrochemical sales throughout the world, it is important that publicity must be channelled into the concept that only governments and government agencies are wise enough and responsible enough to care for and sustain agricultural land. Again this is total nonsense. We are talking about the very land and the very soil on which the farmer depends for his livelihood. This is the soil on which he lives and brings up his children. Are we to pretend that he is less responsible and less knowledgeable than some remote bureaucrat sitting at a desk in some federal capital? That is plain rubbish.

The argument the bureaucrats and the chemical companies make, in obvious collusion, supports demands that if individual farmers make decisions not to take the advice of their agricultural departments and not to constantly dose their land with agricultural chemicals, then the right to make those decisions should be taken from them. How else could agrochemicals actually be forcibly sold?

The PR gurus have to simultaneously promote two almost totally conflicting concepts, and that takes brilliant image marketing juggling. One concept is that to produce sufficient food to feed the world there has to be a massive and continuous use of agricultural chemicals and only then will it all become possible. The other is to sell the concept that farmers should be funded to not produce food on much of their land. The employment of pseudo-environmental issues had to be the only way to handle this obvious inconsistency, but then advertising departments are absolute masters at inventing and promoting conflicting and often hypothetical issues.

STRATEGY 37

PROMOTING HYDROPONICS AND THEREBY PROMOTING AGRICULTURAL CHEMICALS AS SAFE

This is a strategy to create the fictional image of safe and healthy agricultural chemicals, despite the frightening and well-documented deaths and sicknesses from their use and handling.

Clinical tests on human males throughout the developed nations have highlighted a frightening drop in sperm counts. Research is being undertaken to determine the cause and to devise a "cure" for this quite startling decline. A recent analysis of sperm densities in Danish agricultural workers demonstrated markedly higher sperm counts in Danes working on organic farms. Chemical companies can never ever allow stories like this to receive wide publicity.

If the general public, as consumers of agricultural products, reject the use of chemical based agriculture, then farmers, as suppliers, will be forced to stop using chemicals. Agrochemical companies must therefore create in the minds of the general public a perception that pesticides, herbicides, fungicides and fertilizers are safe to use, can be used everywhere, and have little or no effect on the environment and the ecology. And indeed that is happening. False images, totally misleading images, are being manufactured literally to order. Most people instinctively fear the addition of unnatural chemicals to their food, and with good reason. But the power of marketing imagery should not be underestimated; people's opinions are being altered.

Hydroponics is the process whereby plants are grown in vast chemical vats, and soil is totally eliminated from the growing process. It is the ultimate in chemical agriculture. In organic farming the chemical industry supplies nothing. In hydroponics the chemical industry supplies everything; except perhaps water. If hydroponically grown food is perceived as clean, fresh and healthy, the agrochemical companies have a double win. They win because a clean

and safe image of food grown totally in chemical soups is also transferred to farming the soil. The result is more sales to conventional chemically based farmers. And they win because hydroponics is a whole new market for them. If hydroponics achieves a positive image in the public mind then an incredible expansion in agrochemical sales becomes possible.

Ultimately, the perfect scenario for the agricultural chemical companies and the marketers and producers of oil is a world where all food is grown in vast agrochemical factories, a world where the last farmer has moved to the city.

Already a surprisingly successful public relations exercise has created an acceptable image of hydroponics. To support this image reports on comparative food values are deliberately structured to favour hydroponics. For example, in production the essential mineral content of plants can be biased by adding an excess of appropriate chemicals containing that mineral to the brew in which the plant is grown. Nutritional analysis techniques are used to compare the levels of this one element. The hydroponically grown plant naturally wins such carefully structured comparisons. Press releases are worded accordingly. Some methods are not totally specific to particular nutrients. Combinations can be used in more carefully structured tests.

Hydroponically grown plants can thus be shown to have higher chemical nutrient levels than those produced in common farm soils. This can be achieved by a combination of choosing a favourable method of testing, dosing the hydroponic bath with the right chemicals and making predetermined selective comparisons between different tests. But the tests only test for specific elements. But a spoonful of chemicals won't keep you alive.

Good healthy food is rich in nutrient combinations, complex organic structures and enzymes, a whole range of constituents that biochemists have yet to discover and evaluate. We know virtually nothing about the complex biochemical influence and benefits of the many plants and fruits we eat daily. Millions of dollars are spent on studying human biology and food nutrition, and the things our bodies have evolved with, and in turn have learnt to rely and depend on. We still have a long way to go to fully develop such understanding. Promoters of hydroponics like to suggest it is all well studied and well understood, and the food they manufacture in their factories is more than sufficiently nutritious for good human health. The reality is, nobody knows. The reality is, common sense is more trustworthy, and so are your taste buds, which have after all, evolved for that purpose.

Hydroponics lends itself to good visual imagery. Plants can be produced that are large and impressive, albeit nutritionally poor, and lacking in taste. Plants are generally grown in enclosed and relatively sterile environments, so they always appear healthy and disease free. They are always displayed while they are still growing; a wonderful image of health and freshness is imparted to the unwary. From an agricultural chemical sales point of view, these images have to be fostered. Likewise all discussion on the enormous energy requirements to run the factories and to produce the chemicals used must be strenuously avoided.

As consumers, concerned about Global Warming, and concerned about our individual health, we should where possible shun produce grown hydroponically.

STRATEGY 38

ORGANICALLY GROWN FOOD AND SOIL FERTILITY MUST NEVER BECOME ACCEPTED AS VIABLE CONCEPTS

The major threats to the agrochemical industries are organic food production and agricultural practices that enhance soil fertility. Organic agriculture uses almost no products manufactured by the petrochemical industries. If a widespread consumer demand for organic food is allowed to grow, then sales of agricultural chemicals and fertilizers will plummet. The oil and agrochemical companies must put all the brakes they can on the growth of the concept of soil fertility enhancement

and organically grown food.

The National Standards Associations in most Western nations have now adopted and published standards for the growth and processing of organic foods. These standards are surprisingly uniform from country to country and are usually backed by legislation to ensure that food and products labelled or described as organic comply to strict minimum requirements.

Generally for compliance, the area being farmed or grazed must not have been sprayed or dosed with chemical fertilizers, fungicides or pesticides within the last three years. The periods vary slightly from country to country but the principle remains the same. Neither can the crop itself, during its growing cycle, be similarly dosed. The relevant published standards usually contain lists of natural products that may be used in the farming program.

Quite often, specific rules are established to handle the transition period from chemical agriculture to organic agriculture. These are short-term, practical considerations that are permitted so as to assist farm viability during the changeover process, but they are still very limiting.

For the agrochemical producers there is no choice. To them it is absolutely critical to hinder and hopefully stop the expansion of the organic agricultural movement. To achieve this, organic agriculture and all it implies, somehow, has to acquire a bad image. So, watch the press. The marketing people are certain to, and in fact have started to come up with ideas. They always will.

Here is a frightening example of how agrochemicals are promoted as environmentally friendly. It also illustrates how agrochemical marketing people seem to scrape the bottom of the barrel in marshalling support for chemical sales. Apparently, in the Agronomy Department of Egerton University, in Njoro, Kenya, there is a soil scientist and lecturer whose name is Norman Adams. One must wonder why his statements were reported in such detail in such a popular and respected international journal as *New Scientist*.

Adams states, and one might presume this is what he teaches his students in Njora, that while leguminous plants fix nitrogen in soils, better results are obtained with fertilizers. He blithely claims an organic farm would decrease, not increase soil fertility in endeavouring to sustain production. Adams says the importance of humus is grossly exaggerated and plants depend on simple chemicals to grow. He cites selected reports of high production from soils with low organic content to support his claims of chemical benefits. Also to support and encourage the widespread use of pesticides and fungicides, Adams dutifully reminds us of the Irish Potato Famine of 1845 and the locust plagues in biblical times. He blithely presumes that agrochemicals would have totally prevented these happenings.

"What about the claims that organic crops have more flavour, and are better for health?" he asks, and then demands that detailed tests should be done using organized "taste panels" before such statements should be given any credence. Adams also claims that it would be "difficult to prove" that organically grown food was more nutritious.

He suggests that the increase in life span of Western man proves the value of chemical agriculture, and by inference, is not related to increases in medical and human safety procedures. Whereas in reality, the major increase in average life span results from the almost total elimination of child mortality and vastly superior medical expertise. If medical expertise and accidental deaths are removed from the equation, then longevity is actually in decline. Today, on average, people live longer, but extreme age is becoming rarer.

Finally, Adams makes the totally misleading claim that more land is used in organic farming to produce the same weight of food as that produced by chemical agriculture. Even if this were true, bulk is not the only measure of a food's worth. It is often acknowledged that the additional nutritional value of organically grown food more than compensates for any reduction in weight. In fact, most of the additional weight in chemically grown food is simply water in inflated plant cells. That, incidentally, is one of the reasons why they lack taste.

Adams also makes the incredible statement that organic farming's supposed increase in farm area would have a "serious impact" on wildlife numbers throughout the world. He wants us to believe that the wildlife would have no room left if organic farming became more common. In total contrast biologists, veterinarians and many in the animal welfare movements argue that it is agricultural chemicals themselves that pose the greatest threat to the world's wildlife.

All Adams' statements seem to religiously follow the very unsubtle standard over simplification used by the agrochemical marketers. As you might gather from what has been said so far in this book, Adams' claims are either clearly biased, or just plain foolish.

Unfortunately for us all, it now seems necessary to seriously consider and query just who might be funding, and for what motive, the writing and publishing of articles and reports on the effects of agricultural chemicals on environments. It now seems that we must do this before we too readily accept such writings as honest and truly meaningful. Barely concealed bias is becoming the norm. We should also be cognizant of who must be suppressing the undoubted mass of critical reports we rarely get to see on the harm of chemically based farming.

STRATEGY 39

TO SELL AGROCHEMICALS, ORGANICALLY GROWN FOOD MUST NEVER BE RECOGNIZED AS BEING MORE NUTRITIOUS

This strategy indicates again how they try to achieve this aim.

There has always been a prevailing understanding that good food, grown on rich soil, tastes better and is more nutritious. This is something that most of us see as a logical and inevitable consequence of our long evolution. But that doesn't sell agrochemicals. So common sense, logic and useful facts have to be bypassed, or blatantly distorted.

This is achieved by supporting any study or research that supports overly simplified concepts of the chemical structures in living things. Food is an inherently complex mix of complex chemicals and our bodies utilize food in extremely complex, multi-layered biological processes. Because of this complexity, our understanding of these chemicals and biological processes is relatively poor and it is easy to fall for oversimplified and invalid arguments. Agrochemical marketers will always vigorously call into question the additional nutritional value of organically grown food. They use invalid concepts and grossly simplified biochemistry to suggest that any additional food value is negligible.

Undoubtedly our taste buds are an evolutionary requirement to allow us to determine the nutritional value of what we put in our mouths. The reality is, to any animal, nutritious food has to taste better; any species with a taste system that led it to eat foods that made it sick would not survive long in the fiercely competitive evolutionary process. Animals often seek out particular foods to correct nutritional imbalances in their diets; they can only do this by taste, and/or smell. This is noticeably seen during pregnancy and in cases of severe illness. Unfortunately, in this age of highly processed food, taste is often confused by the addition of concentrated flavourings added during preparation. Supporting or promoting the consumption of highly processed and flavoured foods suits the agrochemical companies. But remember, in un-processed foods, taste is invariably a measure of food value. Strong attractive flavours added to a food product are, in essence, false advertising.

Agrochemical marketers always avoid discussions and speculations on these concepts and always imply that taste differences are at most minute, and suggest that the handling and storage of fruit and vegetables, and the geographical area where the product is grown have a vastly more significant effect on taste than the type of agriculture involved. This is an ideal distraction as people can be inveigled into never-ending debate and confusion on essentially irrelevant issues.

STRATEGY 40

AGROCHEMICAL COMPANIES ALWAYS WILL SUPPORT WETLAND AND OCEAN OUTFALL SEWAGE DISPOSAL

Sewage disposal hardly seems to be a subject that would interest the petrochemical industries, but it does and it must. The human population on the planet is six billion people. That is huge. The volume of human excreta produced is enormous. This human waste product makes wonderful organic fertilizer, and for thousands of years it has been used as such in almost every country in every civilization on the planet.

Sewage is a cheap waste product from towns and cities and is loaded with minerals and trace elements. So of course, the chemical fertilizer companies are interested. It's a very competitive product, so the best thing for the agricultural chemical companies is to have it dumped where it is totally wasted and completely out of the marketplace. The ocean is preferred, for there it is totally unrecoverable.

Provided sewage is dumped sufficiently far out to sea to avoid localized concentrations, the ocean can handle it with ease and quite logically will be able to do so for ever. Where are we supposed to imagine whales and dolphins go to the toilet? The millions upon millions of tons of sea creatures, squid, prawns, fish, octopus, lobsters, coral polyps, etc. all contribute to make the ocean one vast, super efficient, biological, septic tank. If the Mediterranean can even remotely handle most of Europe, and it has for a long time, then the world's oceans will suffice humanity forever.

Over eons rain has washed everything possible, and everything imaginable, down the rivers and into the sea. Therefore the world's oceans are already immense repositories of every element known to man, from the most benign to the most toxic. To the oceans, the sewerage outlet from a city would be just another tiny source of nutrients. There have been problems but these have only ever arisen where large concentrations of sewage have been dumped directly into areas where seafood is harvested. Even then the problem is usually more political than real.

If, for geographical reasons sewage can't be dumped in the ocean then as an alternative, fertilizer companies will advocate and financially support the argument that it be dumped into some convenient swamp or wetland. In wetlands it can't damage the chemical fertilizer markets. Dumping sewage in swamps is the chemical companies' perfect alternative to ocean dumping. Swamps don't produce food and as the wetlands get smothered with excess nutrients the biological environment within them deteriorates opening up a possible new market for some new chemical fix. Also very little usable wood can be grown in swamps, and if it could it would be difficult to harvest.

Also, as the swamp gets bigger due to sewage overload, it reduces the area of usable neighbouring agricultural land, which tends to force more intensive farming. Better still.

To finally ensure that nutrients in the sewage are never ever used, the whole expanding swamp areas, renamed as wetlands, are hopefully turned into "national parks". The argument used in this ploy is that wetlands are the home of a whole variety of wildlife. Of course they are; every bit of land, anywhere on the planet, whether it be swamp land, crop land, range land, forest land or wilderness, is the perfect home for some or other forms of wildlife.

Also defining swamp areas as "wetlands", or redefining new areas as wetlands makes marketing sense to the agrochemical industries. For them the disposal of sewage into some nearby wetland is an ideal scenario. Yet for us it's idiotic. The logical reality is that wetlands should never be used for sewage disposal. The dead and dying vegetation in swamps and wetlands eventually sinks. The stagnant water in swamps is lacking in oxygen so the rotting vegetation cannot form true soil. The dead vegetation decomposes and putrefies in a process very different to that involved in the creation of humus. Under water it is anaerobic bacteria, that is non-oxygen breathing bacteria, that digest the

dead plant material. The byproducts of anaerobic decomposition are gasses like hydrogen sulphide (rotten egg gas) and methane (marsh gas). That's why swamps smell. Methane is also twenty times more potent a greenhouse gas than carbon dioxide itself. After several thousand, or more like millions of years, the material finally left at the bottom in a swamp forms peat.

Because peat is formed in the absence of oxygen, if it ever dries out it's flammable. In Russia, millions of acres of ancient peat beds exist and are the "subsoil" of thousands of farms. The local farmers there don't have bushfire problems; they have something worse. In extremely dry conditions the very ground on which they live and build their houses and farm their farms can catch fire. These smoldering underground fires are often extremely difficult to control. Some can smoulder for centuries.

It is quite impossible for the biological activity in a swamp or wetland to utilize the never-ending flow of super rich nutrients delivered from sewage outfalls. Wetland biology did not evolve and develop under these conditions. Chemical nutrient levels therefore soon build up to where they become actual poisons; poisons that can never escape. The vegetation and the wildlife, all those things that were the professed motive to keep or protect or create the wetland, all eventually die. Forms of algae take over that are often poisonous. Then chemists are called in to develop or recommend some new chemical additive to cure this "strange new problem".

That's what ultimately always happens with wetland sewage disposal. How could it be anything else?

To many people, using sewage as a fertilizer is an anathema. Yet animal excrement is used and its use is universally accepted. Such material is rapidly broken down and the minerals become available to plant growth in any soil that has a reasonably low content of agrochemicals. The breakdown process is totally biological and that is why most chemical fertilizers prevent it, as they kill soil bacteria and earthworms. These processes see no difference between the excrement of animals and that of humans. The only possible difference is that humans, being the top of the food chain, may have slightly higher concentrations of some toxic elements in their excreta. But these tiny traces, (when they do exist) are easily chelated and locked safely away by humic acid molecules in the inevitably good healthy soil.

Neither are human pathogens in the sewage a problem. It's a general rule that harmful pathogens don't survive in fertile soil. *Homo sapiens* have had plenty of time to become immune to germs that do.

For the fertilizer producers there are several angles of attack that can and must be used to prevent sewage use in agriculture. Anti-social stigma is one that has to be fostered. Some hypothetical threat of spreading disease and plague must be given wide press. Yet this is easily fixed by simply exposing the treated sewage to either sunlight or by passing it by ultraviolet lamps. Both efficiently sterilize the material, if that is desired.

Fortunately for the petrochemical companies, in many cities industrial chemical waste is disposed of through the sewerage system. Even vaguely poisonous properties of any of these chemical wastes can be exaggerated. It can also be suggested that the poisons cannot ever be removed. In some rare situations where this actually might apply, the sewage should be used to grow timber, especially rainforest varieties. At worst, at some impossibly high concentration, it would merely pest-proof the timber produced.

The general population must be coerced into feeling threatened – feeling distrustful that poisons might get into the food chain. All this then vindicates the concept of locking sewage out of any recycling possibilities. It also, at least, defers decisions on possible reuse. Then long drawn out, self-righteous "safety checks" are always instigated.

All these ploys to stop the agricultural use of human sewage are conveniently and invariably claimed as "social responsibility".

From an environmental point of view, our current methods of sewage disposal defy logic.

Sewage, treated or untreated, is extremely rich in soil nutrients. Sewage naturally contains every element required to produce life. After all that's where it comes from. We do not accumulate essential elements or minerals in our bodies; we require a constant intake because we are continually excreting them. Sewage also contains very large quantities of both nitrogen and phosphorus. Nitrogen is the element being sold in nitrogen-based fertilizers. Phosphorus is the element being sold in superphosphate.

The only logical, sensible, practical, inexpensive and environmentally perfect use for sewage is to grow plants. That's what excreta has been doing for a thousand million years and, logically, there is absolutely no reason why those plants can't constitute useful and valuable crops.

When human sewage becomes a socially acceptable fertilizer again, then the crops in turn will be acceptable for human consumption. But for now, the crops can be trees or grasses. I think the smartest thing to do at this stage, and to forestall green pawn protesters, is to plant and grow useful rainforest timber and fertilizer it with partially processed human excreta. This concept is the theme of my late father's book, *The City Forest*, P.A. Yeomans, 1971.

The economical and rapid growth of useful and valuable timber fertilized with organic human waste, is the antithesis of everything the oil and agrochemicals industries advocate in their marketing of both agrochemicals and plastics.

STRATEGY 41

DESTROYING THE ASBESTOS, HEMP AND NATURAL FIBRE INDUSTRIES

To sell petroleum based plastics, fibres and materials with high energy content, the image and market of already existing and established natural products has to manipulated to destruction.

The structure of the natural fibres, cotton and wool etc, is such that garments made from these materials feel very comfortable against the skin. Cotton has marvelous "wicking" properties that rapidly absorbs moisture away from the skin. Wool has the wonderful property of effectively releasing heat when it absorbs moisture, so woollen garments keep you warm, even if you get wet.

When the plastics, nylon, rayon, terylene etc. were first developed, tremendous efforts were made to establish them as viable alternatives to natural fibres for the clothing industry. Despite all the efforts it was never dramatically successful. The synthetic materials had an unnatural and uncomfortable feel. There were two main faults. The materials when dry could often build up unpleasant static charges. Wet, they had another fault, they trapped moisture near the skin and ruined our natural ability to cool ourselves by sweating. Nylon stockings were about the only dramatic success story.

But soon clothing manufacturers found that blending natural fibres with synthetics produced attractive and practical combinations. This has been a major success story. Blended clothing materials are often superior to either the straight natural fibres or the synthetics.

In general, from a marketing point of view, old established natural fibres are hard to combat. But there are always possibilities that the petrochemical companies' marketing and public relations people can exploit to sell their products. Almost all plastics today are made from oil, and they require a lot of energy to produce, usually oil or coal derived power. The reality is that oil pulls the plastic-fibre strings.

INDUSTRIAL HEMP

Hemp is a classic example of such market manipulations. Hemp is best known for its use in making cordage, the familiar hemp rope. But that's only one use. The North American Industrial Hemp Council claims there are over 25,000 products that can be made from the industrial hemp plant. The list includes such items as paper, cloth, lubricating and edible oils, construction materials and varnishes. The oil produced from hemp can even be used to make biodiesel. The Kimberly-Clark Company mills industrial hemp

in France to produce a high quality paper. This paper is often preferred for the production of bibles as the hemp paper lasts longer and doesn't yellow with age.

It was a sad loss for the world, but a surprisingly easy task for the petrochemical industries to virtually eliminate the world production and use of hemp. Or at least in their major market, the Developed World.

To achieve this hemp was simply linked to the drug marijuana and legislators around the world were effectively coerced into banning it. It took some time, but for the petrochemical industries it was worth it. In the United States the Marijuana Tax Act of 1937 started hemp's demise. The end of hemp was effectively completed globally by the late 1950s.

Industrial hemp fibre comes from a shrub that belongs to the plant genus Cannabis and there are hundreds of varieties within the Cannabis genus. Sailcloth was originally commonly made from cannabis plants and the word "canvas" is derived from cannabis.

Cannabis plants produce chemical compounds know as cannabinoids of which two are important: *delta-9-tetrahydrocannabinal* (THC) and *cannabidiol* (CBD). THC is responsible for the narcotic effects associated with marijuana, while CBD actually inhibits the narcotic effects. At one end of the spectrum of cannabis varieties, there are plants which produce a lot of THC, up to as much as 6% by weight, but very little CBD. These plants, *Cannabis sativa*, are the ones classed as "marijuana". At the other end of the spectrum is "industrial hemp", which produces almost none of the narcotic THC, but does produce some inhibiting CBD, the contents of either chemical being usually less than 0.25%. The plants are similar in appearance, as is for example sweet corn and maize. It is however impossible to get "high" with industrial hemp plants. The THC levels are way too low, and the CBD levels guarantee a zero narcotic effect. The smoke from burning the industrial hemp plant would be no different to the smoke wafting off any back yard, wood fired barbecue.

The plastic industry's natural duty to itself is always to resist, inhibit or thwart the use of any natural fibre or any naturally fibrous material. Confusion is one of their most favoured stock techniques and this was used very effectively with hemp. As a result industrial hemp has, to all intents and purposes, been abandoned and often effectively banned as a viable commercial crop for fifty years. Nevertheless there is hope; Denmark for example has re-commenced cautious agricultural experimentation.

One must wonder how much of the anti-marijuana campaign is funded or otherwise supported by the fossil carbon industries. One might also wonder whether the tobacco and alcohol lobby actively and materially support the never-ending anti-marijuana campaign. It would certainly cut their sales drastically if it were ever to become legal in Western societies. Self interest always predominates: the anti-hemp campaign goes back to the 1930s when both the US forestry industry, concerned about paper production and the US cotton growers, concerned about fibre production, both attacked hemp.

The use of heroin and its derivatives is legal in medicine. The use of the relatively harmless marijuana derived THC in medicine is almost totally and violently prohibited. Why this should be seems to have only one sensible and logical answer: Hemp rope and hemp products might reemerge to again compete in the marketplace.

To all in the petrochemical companies, it is surely obvious that the confusion between industrial hemp and marijuana is a confusion to be exploited. By promoting and supporting any groups campaigning against the legislation of marijuana, the petrochemical companies keep at bay a serious industrial threat. They also get a double win by also seeming to appear as responsible, caring and moral organizations. The tobacco and alcohol producers of course have to come on side with the petrochemical industries. It's like an unholy triumvirate.

ANIMAL FURS

Fashion is a tricky thing. Animal furs make

comfortable, attractive and very warm coats. For a long time, the animal liberation movement has been endeavouring to make the fur coat a socially unacceptable garment. Why? Who beats their drum and pays their expenses. They are not all motivated by altruistic zeal.

In Australia, introduced foxes, feral rabbits and cats have spread throughout the country. Rabbits in particular have achieved disastrous plague proportions. The foxes and cats find the small, rare native marsupials and the flocks of native birds far easier game than the "street-wise" European rabbit.

The few large marsupials that survived the original human population influx into Australia, such as the Eastern Grey kangaroo and Western Grey, easily elude the smaller feral cats and dogs. In addition, outback farmers in Australia constructed dams to water their sheep and cattle. The kangaroos found the dams and so found an extremely reliable and plentiful supply of water. So in drought times the big kangaroos don't slowly die of thirst as they once did. Instead, their numbers regularly zoom to extreme plague proportions. Nowadays, there are more kangaroos in Australia than people in Mexico City and New York City combined.

Kangaroos like most marsupials are not particularly intelligent, and so, although usually supported by animal liberationists, family planning clinics, contraception pills and sterilization, are a smidgen impracticable. It is a sad thing to contemplate that the skins of kangaroos and unwanted feral mammals are left to rot in the sun, while we are badgered by animal welfare groups to support oil-derived plastic fibre products as a substitute for their skins and leather.

THE ASBESTOS STORY

Asbestos is now probably one of the most feared contaminants in Western society. But is it as bad as we are all now conditioned to believe? Or are we all jumping, with knee-jerk reactions, to some blatant public relations orchestration? The truth is that now, and for the last thirty years, the only asbestos type material mined anywhere in the world of any significance is as safe as rockwool (mineral wool), or fibreglass, or many of the plastic fibres manufactured to replace the "dreaded asbestos".

Normal industrial safety standards covering the manufacture of brake linings, fibre cement sheets and pipes, and other fibre composite materials are completely safe and satisfactory for the asbestos now mined. It is certainly as safe as the most of the materials promoted to replace it.

Asbestos once had a very big and constantly expanding market. It was a market obviously coveted by the petrochemical producers and their plastics industries. Just think for a second how big the asbestos cement pipe and the asbestos cement sheet business was. And they wanted it. Therefore they needed asbestos out of the picture. Asbestos is not a product of any petrochemical manufacturing facility, anywhere, anytime, anyhow, and not in any possible future. And they knew it. Asbestos is a naturally occurring fibrous rock. You simply dig it out of the ground. Then you weave it.

Minerals in the earth's surface come in all shapes and sizes and in a host of different forms. For example, mica and vermiculite are two other naturally occurring minerals with useful properties. Mica forms in flat, multi-layered, dark gold coloured crystals; small particles of mica can be seen as the gold coloured flakes in granite rock. Mica sometimes forms naturally in large sheets, and in this form was mined and used extensively as a flat electrical insulator capable of withstanding very high temperatures. Very little energy is required to mine and shape mica, yet oil-derived plastics have generally replaced it as an insulator.

The mineral vermiculite, like mica, exists in a flat crystalline form. Vermiculite has a similar gold color. When particles of vermiculite are rapidly heated tiny quantities of water in the structure turn into steam and the little particles puff up like concertina-shaped popcorn. This expanded vermiculite is an excellent thermal insulator. Vermiculite has generally been replaced by plastic fibre, aluminium foil, rock

wool (mineral wool) and glass fibre, all of which require huge fossil carbon inputs either as raw materials for their manufacture or for energy to power the processes. Vermiculite has not as yet been targeted, but watch for media inferences that vermiculite somehow, has some yet to be invented "problems".

Mica and vermiculite form as flat crystalline sheets, but some minerals form fibrous strands. In some cases the fibres can be yards long. That's asbestos. In the ground, it looks like just another type of rock, but break the material up and it becomes like a natural bundle of fibreglass or rockwool material. Some forms have fibres as fine as threads of silk.

Being minerals formed in the cooling of molten magma, the fibres are utterly fireproof. When bundled together and soaked in oil or fat the fibres make a great torch. These were the torches that once carried the Olympic flame. A wick made from the fibres would last almost indefinitely and so the ancient Greeks named the material "asbestos" meaning "inextinguishable". Plutarch indicates that the "eternal flame of the Acropolis" had an asbestos wick.

Asbestos can be woven into cordage and a whole range of totally heat resistant cloths. The fibres are actually stronger than steel. The cloth can be thrown into a fire to clean and sterilize. The Romans named it "amiantus" meaning unpolluted, because it came out of the fire whiter than it went in.

Under the heading of "Asbestos" there are six main minerals, actinolite, anthophyllite, amosite, crocidolite, tremolite, and chrysotile. Three were used commercially. Of these three, amosite or "brown" asbestos, and crocidolite or "blue" asbestos are no longer in commercial use. The only mineral described as asbestos that is still in any commercial use is chrysotile or "white" asbestos.

Brown and blue asbestos fibres are known as amphiboles. Amphiboles are extremely strong, hard and straight and are highly resistant to most forms of chemical attack. These properties make them an ideal fibre for commercial use. Unfortunately, these very attributes ensured the amphiboles' own well-deserved demise.

If amphiboles, the brown and blue types, are inhaled or swallowed as dust, tiny pieces of the straight fibres can embed themselves in the lung tissue or gut lining. Being almost chemically inert, they can accumulate in tissue to reach dangerous levels.

The vast majority of asbestos used in industry was always chrysotile or white asbestos. Its characteristics are as different from brown and blue types as poisonous toadfish are from tasty tuna. Worldwide, chrysotile eventually accounted for more than 99.5% of total asbestos use. Chrysotile also goes under the name serpentine because its fibres are not straight, but twist and turn in a snake-like fashon. The ore too can display a distinctive mottled snakeskin-like appearance in the ground.

In absolute contrast to the dangerous forms of asbestos and glass fibre, chrysotile fibres, being curly, don't slither into flesh. Not only that, but being much softer than amphiboles they can be broken down relatively easily within the human body. They are thus like the common glass fibre used in boat building. They are like man-made mineral wool.

Constant inhalation, in high concentrations, of the dangerous straight amphibole fibres over long periods, ten years or more, will harden and damage the linings of the lungs. Shorter but very intense exposure can have the same effect. The ancient Greeks and Romans recorded a sickness of the lungs in the slaves who cut and wove these fibres into cloth. In more modern times, enormous quantities of the dangerous forms of asbestos were mined in remote locations in southern Africa. It is unlikely that health requirements in any of these mines received a priority any higher than those applying to the slaves of ancient times. Many mine workers died from the health condition that came to be called "asbestosis."

Asbestosis is not lung cancer; it is a scarring of the lung tissues that ultimately restricts air flow and oxygen uptake. The occurrence of asbestosis in asbestos workers is somewhat similar to

black lung disease in coal miners. Both are more debilitating than life threatening but both can kill.

Mesothelioma is different. It is a cancer caused particularly by exposure to the dangerous amosite and crocidolite minerals, the "brown" and "blue" types of asbestos. It is a cancer of the cells that make up the lining around the lungs and sometimes around the abdominal organs

Asbestosis was quite common in asbestos milling, weaving and processing plants in the United Kingdom in the early part of the 20th century. In 1931, to safeguard personnel working in the asbestos industries, the UK Asbestos Industry Regulations Enactment was enacted. However, at that time the relative dangers of the different types of asbestos was not appreciated.

Asbestosis may have been checked by these safety laws but mesothelioma was different. It was not until the 1960s that warnings about the risks of mesothelioma suddenly received wide publicity. Asbestos workers had an incidence of lung cancer as much as 8 or 10 times the national average. That meant that the risk of an asbestos worker developing lung cancer was as bad as that of a person smoking cigarettes.

All this makes the mining and milling of asbestos, and the production of components containing asbestos fibre, actually no worse and in many cases safer, than a host of other mining and industrial processes. So why was asbestos given such a hard time? Why is it still perceived as such an evil, dangerous and hazardous product?

The track record of the cigarette companies is not dissimilar to that of companies that produced asbestos; both seemed to be aware of the cancer risks associated with their product and both kept quiet about it. The cancer risks for tobacco and asbestos are about the same. Cigarettes manufacturers obviously ignored or "buried" details on the health risks of smoking. If the distributors of brown and blue asbestos knew of the cancer causing consequences of working with their products, they too chose to do the same. After all, sales volumes were at stake.

What was more deadly was that the two risks combined produced a murderous multiplying effect. If you smoke cigarettes and work in the asbestos production industry, then the likelihood of you contracting lung disease is high. The Encyclopedia Britannica claims a ninety-fold increase in the incidence of lung cancer for workers in the asbestos industry who smoke.

As a matter of interest to smokers, you might remember the much-promoted "Micronite" filter manufactured by Lorillard Tobacco. The filter was supposed to remove all those bad things from cigarette smoke. In his excellent book, *The Asbestos Racket,* published in 1991, Michael J. Bennett tells us that the "presumably secret element in the Micronite filter was blue asbestos." Thirty-three workers making these Micronite filters were studied. Bennett reported at the time that twenty-eight of these people had already died and only one death was not asbestos related. Blue asbestos can be very dangerous.

However, chrysotile or "white" asbestos compared to blue asbestos is like comparing chalk and cheese. Bennett's book warns us of the extreme dangers of both blue asbestos and brown asbestos, but expounds the considerable worth of the totally different chrysotile, or white asbestos.

The combined risk of smoking cigarettes and working with asbestos was too alarming to be glossed over. One of them had to go, asbestos or tobacco? The cigarette companies had the money. They also had the influence and the advertising dollars. In the US the result was that their Environmental Protection Agency put a total ban on virtually all forms of asbestos in use, anywhere. In complete contrast, the EPA made the cigarette companies put a warning on their packets that cigarettes were a health hazard. A relatively small printed message at the bottom of the pack seemed to happily satisfy the United States Environmental Protection Agency for a statistically more deadly health risk.

The whole thing was so blatantly biased that finally in 1991 the Environmental Protection Agency's all-encompassing ban on all forms of asbestos fibres had to be slightly more logically modified to more fairly align with reality. Rules

for asbestos use in the US are now tempered with common sense. With current safety standards, mortality rates from active industrial exposure to asbestos fibre is now considered to be minuscule. When compared with such things as smoking or drinking alcohol, the modern asbestos industry is safer than any hospital.

The Royal Society of London, the World Health Organization and in Canada, The Ontario Royal Commission on Asbestos, and others, have stated most emphatically that air containing asbestos dust with concentrations as low as one asbestos fibre per litre are insignificant, that is about thirty fibres per cubic foot. A large study reported by the Canadian Asbestos Institute indicated that chrysotile workers breathing air containing forty-five thousand fibres per litre showed no statistical increase in the incidence of lung cancer.

Ordinary air, all over the world, contains small quantities of asbestos fibres in the form of airborne dust. These fibres don't come from man-made sources. They come from the geological decomposition and weathering of natural rock formations containing the various types of asbestos minerals. These fibres include the dangerous amphiboles of blue asbestos. The United States National Academy of Sciences and National Research Council concluded, in a 1984 study, that the average outside air concentration throughout the US is 0.4 fibres per litre, while in major cities concentrations ranged up to 7 fibres per litre.

There is an often used anti-asbestos copy line that runs "one fibre can kill". It dramatically infers some extreme danger associated with asbestos. In medical documentation the cliché is described as being beyond the "bounds of scientific reality". United States citizens, breathing air containing an average of 0.4 fibres per litre, breathing about 10 litres per minute, 60 minutes per hour and 24 hours per day, would breathe in an average 5,760 fibres per day. If "one fibre can kill" then the entire population of the United States, every single human being in the country, would already be dead.

Asbestos cement sheets were once one of the most commonly used materials in building construction. Millions of houses and thousands of factories in just about every country on Earth were walled in and roofed over with corrugated asbestos cement sheeting. We should all be dead.

While all the supposedly incredible dangers are, in scientific circles, recognized as fiction the dreadful image of all forms of asbestos has been irrevocably established in the public mind.

As a result, and with government insistence, the asbestos used in the manufacture of fibre reinforced sheets has now been replaced with a plethora of less worthy fibrous materials. And there seems to be no sane health reasons for the change.

One thing the substitutes all have in common; they are all either derived directly from oil or they use large quantities of oil in their manufacture.

To compound this waste and stupidity, demands are being made to remove all asbestos based products from all buildings. The removal would start with public buildings. Such an action won't make one single person live one day longer. If anything the opposite will happen. Dust is created and stirred up when old brittle sheets are broken during removal. The cement becomes more brittle with age, not the fibres. This creates a hazard where none previously existed. We can be absolutely certain that hundreds of workers around the world maybe thousands will die from accidents, all totally unrelated to asbestos during such a ridiculous and insane process. The petrochemical and plastics industries will be their only beneficiaries.

Drinking water conveyed in asbestos cement pipes is safer than drinking water conveyed in PVC pipes or even steel pipes. Automobile brake pads made with asbestos fibres are far and away the safest brake pad now possible. On a steep decline asbestos won't break down if your brakes overheat. Good brakes save lives.

Asbestos fibre and the asbestos industry has been given the same vicious image destroying treatment as nuclear energy and the nuclear energy industry. In the nuclear energy public relations battle, plutonium has been particularly singled out as the epitome of all things dreadful, yet asbestos

and plutonium are both about as safe and about as dangerous as thousands of other chemicals, products, and materials used in our modern day civilization. It is just that in the production, both are independent of fossil carbon materials, but both compete with fossil carbon materials.

Today, because of deliberate structured advertising and image manipulation, almost the whole of Western society now "knows", with absolute certainty, that asbestos is one of the greatest horror stories of modern civilization. The belief that asbestos is an horrific health hazard, anywhere and at any time, is now so ingrained in our minds that it's an eerily alien concept to believe, or even suspect that much of it might be a marketing fiction.

STRATEGY 42

IMPLYING DISPOSABLE PLASTICS ARE "GREENER" THAN WOOD, PAPER AND CERAMICS

This illustrates how establishing ridiculous and illogical beliefs within the general public's overall awareness can be made to occur when we are not extremely watchful. From the oil producers' point of view, it is simply good marketing to keep the buying public uncertain, confused, and undecided. If comparisons can constantly be dreamed up that imply that oil-based products and oil-based energy sources are more environmentally desirable, public confusion can reign supreme. And, sadly, now mostly does.

References to happy, carefree, eighty-five year old chain smokers, have maintained a poisonous cloud of indecision over the health risks of cigarettes for over half a century. The big oil companies know that they must use the same tactics or they too will be brought eventually to bay. Confusing themes and red herrings must be used over and over again to confuse and confound.

Take plastic cups for example. It is being promoted by the petrochemical lobby that plastic disposable cups are more environmentally friendly than paper cups. It's even been suggested that plastic disposable cups are more environmentally friendly than non-disposable ceramic mugs. Now to most of us, these statements immediately appear ridiculous. Here the plastics advertisers had to create arguments and numbers to "disprove" common sense.

With paper cups one promotional line hammered that paper cups are made from trees. Oil company marketing always implies that trees are not a renewable resource. The fossil carbon industries' marketing tactic that trees should be constantly planted, but of course never ever harvested, is brought into play.

The energy required in the harvesting and transport of raw materials, and then in the manufacture of the paper cups is tallied, but always wildly exaggerated whenever possible. In contrast the energy inputs to manufacture the plastic are glossed over. So the logic is distorted and throwaway plastic cups appear to be the lesser of two evils.

The disposable plastic cup is a good heat insulator and this characteristic is inferred to have some significant environmental advantage. Why this should be so is not explained. It is a valid, marketable, convenience attribute, but has no environmental relevance what ever. Nevertheless the insulating properties are being carefully blurred with notions of environmental responsibility. Fossil carbon industries' PR people love to blur the picture.

But we can fight back. If we demand it, we can have it both ways. Plastic manufacturers rely on oil for their raw material but this is not at all essential. Algae and various plant materials can be just as good and just as cheap for raw materials. For example: the major by-product in the totally environmentally friendly production of biodiesel is glycerol (glycerine). As a raw material in the production of plastics and other current "petro" chemical's products, glycerol is excellent and the quantities are an excellent production match.

Arguments for plastics and against ceramics use the same energy-of-production factual distortions. It is presupposed that a ceramic coffee

cup has only a very limited statistical lifetime. The argument then becomes: To "fire" ceramics uses a lot of heat energy and electrically heated kilns are common. So this energy use, divided by the statistical usage of the coffee cup, gives an energy requirement per use.

The energy used is first presumed to be derived from coal-fired power stations. Such arguments rely heavily on this presumption. Therefore ceramic cups result in the production of greenhouse gasses and are therefore environmentally undesirable. They further argue that the ceramic cup is not thrown away and has to be washed. Energy is required to heat the washing up water. It's the same argument used in Strategy 13 against electric cars. Electric cars, they argue, are pointless as power stations run on fossil fuels.

In this way, the ludicrous determination can then be made that the oil-derived, throwaway, plastic cup actually contributes to the environmental wellbeing of the planet, and reusable ceramics are a danger.

Not everyone blindly accepts the validity of these fairy-tale conclusions. However, a great deal of doubt can be insinuated into general public awareness. The objective, as always, is to have clear reasoning muddied.

STRATEGY 43

STOPPING TIMBER AS A THREAT TO OIL AND PETROCHEMICALS

To keep and to expand the sales of petrochemical products and to sell more fossil fuel energy, the timber industry has to be attacked and destroyed.

The oil companies know this only too well. Enormous quantities of energy are consumed in the manufacture of virtually all construction materials. There is only one incredibly significant exception, and that is wood.

Items from toothpicks to apartment buildings are made, very satisfactorily and very successfully, from wood. Timber is a natural and innately beautiful material. So to sell petrochemical dependent materials, wood has to be tainted. Wood has to acquire a bad image. It is important therefore that timber must be attacked on all fronts. Facts and truth must never hamstring the image destroying process. Wood's competitors are either made out of oil or use massive amounts of fossil fuels in their manufacture. So naturally the fossil carbon industries must always support wood's competitors.

Every one of wood's competitors is a serious contributor to Global Warming. Aluminium is refined from the ore bauxite. Enormous amounts of electricity are used. It depends on all kinds of factors but as a rough approximation it takes about six tons of oil or nine tons of coal to produce one ton of aluminium. An aluminium refinery can use as much electricity as a medium sized city. In the component costs of aluminium, electricity costs are by far the greatest. They easily exceed the costs of the bauxite ore. In Australia, as in many countries, the electricity to produce aluminium comes mainly from burning coal. If hydroelectricity is the planned power source for an aluminium smelter, instantly the save-the-river green pawns are called in to protect the fossil fuel interests. This happened in Tasmania and natural gas is now piped to the island. For such systems, if power is already hydroelectric, other green groups then demand the dams be removed. Always to supposedly save some special fish, or view, or whatever.

Iron is one of the most common elements on our planet. The inner core of the earth is composed almost entirely of iron. 35% of the whole planet is iron. However, in the earth's crust it amounts to no more than 5% of all materials. It is expensive to obtain metallic iron except when the iron is in the form of a couple of very specific ores, namely haematite and magnetite. Iron ore is placed in a blast furnace along with coke and limestone and heated. The limestone is used to scavenge silica and ash from the melt and so produces slag.

Initially the heat is provided by gas or oil fired burners that is then delivered as a blast of hot air fed in at the bottom of the furnace. The coke ignites to provide more heat. Because it is burning in a

carbon-rich oxygen poor environment, and at high temperatures, it produces large quantities of carbon monoxide. The hot carbon monoxide and the coke in the furnace reduce (removes oxygen from) the iron ore to produce metallic pig iron and carbon dioxide. Only tiny amounts of carbon remain in the final pig iron. Some carbon remains in the furnace slag, but the vast majority is discharged into the atmosphere as carbon dioxide.

Coke is basically pure carbon, manufactured by heating bituminous coal in the absence of air. This process itself requires considerable energy input. Enormous quantities of coke are used in the production of iron and steel. In consequence enormous quantities of carbon dioxide are discharged into the air.

Steel is iron in which the carbon content has been carefully modified. Steel is formed by blowing oxygen through molten pig iron. This process removes more carbon that discharges to the atmosphere as carbon dioxide. Steel also contains small quantities of other added metals to improve its qualities and strength. But steel is the construction material on which we have built our civilization. Nothing beats steel in big construction projects so, like it or not, we have to stay with it. However from an environmental point of view, from the point of view of preventing Global Warming, if wood can be used to do the job, it should be. Using steel to frame a residential house must be recognized as a display of callous irresponsibility.

Plastics use a lot of energy in their manufacture, but more significantly, the actual raw material from which almost all plastics are derived is oil. Again if wood can be used to replace plastic it should be.

Cement is made from clay and limestone. The material has to be heated to 1,450ºC and this takes massive amounts of energy. Again that heat energy comes from the burning of coal or oil. About 4.5% of the world's total carbon dioxide emissions come from the burning of fossil fuels to make cement. In addition, the chemical process itself, that is, the high temperature conversion of calcium carbonate (the limestone) to calcium oxide (the active ingredient in cement) contributes another 2.5% of carbon dioxide to the world's total emissions. The figures quoted here come from Joseph Davidovitz of the University of Picardy in France, and they are typical of carbon dioxide emissions from cement production throughout the world.

Stone has always been a common building material, yet even stone needs far more energy to prepare than wood. The raw cost of stone, as a construction material, is negligible. The world is made of it. Yet stone, when cut and prepared, is a very expensive item in construction. A lot of time and energy is consumed to saw up rocks and turn them into building blocks. Timber is easy to cut and the energy to mill timber is relatively minute.

Bricks are a much more common construction material than stone and much cheaper. But every brick in every house, in every city in the world was once clay. That shaped block of clay had to be heated to very high temperatures where finally the clay particles melt and fused together. To make bricks, you burn oil or you burn coal.

The one exception to this rule is sun-dried mud blocks. Unfortunately suitable mud is not often available. Also using, often inane reasoning (which a cynic might suspect was supplied and fostered by fossil fuel interests), many local building ordinances have been modified to effectively ban mudbrick or adobe construction.

But all is not lost; the energy used in the production of all these various materials, apart from iron and steel, could come from sustainable energy derived electricity. Producing iron and steel will always produce large quantities of carbon dioxide. But we can never abandon the use of iron and steel, but neither is that necessary. The quantity of carbon dioxide generated in their production may be large but it pales to insignificance when compared to the quantity produced in the generation of electricity and in powering our transport systems. Fix those and we can have our steel. Of course where possible, timber should replace steel, but never should steel replace timber.

With cement a similar argument applies. Carbon dioxide is released in the chemical process, but the actual energy requirements could be derived

from sustainable sources. Again however, where possible timber should be the preferred option.

As a material of construction, wood has excellent characteristics. There are dozens of varieties, each with its own unique properties. Bridges can be made out of timber. Salad bowls can be made out of it. We have been building houses out of wood for thousands of years. It also makes the best tooth picks. It comes in an infinite variety of patterns that can be polished to reveal stunning beauty. The fossil carbon people don't like wood because no oil, no coal, no gas, is consumed in the manufacture of wood – only sunlight. Describing wood as "God's own plastic" is apt.

Because of the wonderful and incredibly competitive properties of natural wood, it becomes the job of the advertising and public relations departments of the petrochemical companies to give the material a negative image. If they are not endeavouring to do just that, then they are not doing the job the oil companies pay them to do; heads would roll.

How are the marketing gurus of the fossil carbon lobbies achieving these aims? There are many marketing techniques and lobbying manipulations. The most obvious and significant of these are considered in the following strategies for they too need to be appreciated.

STRATEGY 44

PROMOTING THE IDEA OF TREES AS A CARBON SINK BUT NOT TIMBER PRODUCTS

This is the ultimate mind-juggling act to establish a winning position for the fossil fuel and petrochemical industries.

For the oil companies, forests that tie up rural land are O.K. but wood, which competes with plastic and other oil-reliant materials, is not. This Orwellian type "double speak" is not easy to sell. However, the oil-marketing gurus know that even the most rational and responsible lay person can be made totally confused when technicalities are deliberately made unnecessarily complicated. The actual numbers involved, the areas, the weights, the volumes, for carbon entrapment in carbon sinks are not easy to find and very time-consuming to analyse. And as always, a certain measure of truth is always conveniently stretched by the image-makers to cloud factual realities.

People are being brainwashed so effectively by the fossil carbon lobby that growing useless trees, on useful farmland, is accepted as responsible. At the same time, making useful products out of timber is becoming frowned upon. Resisting the harvesting of timber while simultaneously supporting the planting of trees is a brilliant public relations juggling act. But it is an act of almost criminal irresponsibility.

Timber is such an important enemy of the fossil carbon industries that they must constantly resist the establishment of huge plantations of good usable trees. Also, they want the harvesting of already existing, good quality, naturally sown timber to be stopped. At the same time, and as per their general marketing policy, good agricultural land has to be taken out of production to boost agrochemical sales. See Strategies 35 and 36.

The agrochemical marketing gurus support useless trees being planted in good food producing crop-land. It ensures the land will be unavailable for food production indefinitely. Both these objectives must be accomplished while simultaneously enhancing the public image of the fossil carbon industries.

Unfortunately these marketing strategies, if they continue to be successful, guarantee continuous and disastrous Global Warming. The concept of planting non-harvestable trees to combat Global Warming is an utter fiction.

In 1982, I planted one hundred and twenty native Australian trees and shrubs, of various varieties, at our home in Forbes, in central New South Wales. Most of the plants survived. Many grew to maturity and died. A few of the larger trees are over three feet (one metre) round at the base but most are much smaller. In 1995, thirteen years after planting, I calculated the atmospheric carbon dioxide effects of those plantings and compared it to the emissions from the cars that my wife and I drive.

My rough, back of the envelope, calculations show that the wood in our garden had a total mass of only around two tons. At best trees absorb two tons of carbon dioxide from the atmosphere to produce one ton of wood. That means roughly four tons of atmospheric carbon dioxide have been absorbed. My wife and I are both low to average car users; our cars therefore release each year about twelve tons of carbon dioxide. So the carbon dioxide absorbed by our trees and scrubs, in that thirteen-year period, is less than that produced from the petrol burnt in our two cars in just four months of driving.

To absorb the carbon dioxide produced from just our two cars, we would need to grow enough vegetation, trees, scrubs and whatever, to absorb, not four months of car use, but thirteen full years of car use. That's 5,000 plantings. Alas, once the trees mature they reach an equilibrium where no more carbon dioxide is absorbed. In general our trees have been like that now since 1995.

The shrubs and trees we planted are typical native varieties for the area. We cared for and watered those plants to make sure they survived and thrived. Of course, if we had planted fast growing, forestry-type trees, a much larger amount of carbon dioxide would have been absorbed per tree. But we would not have been able to fit anywhere near as many on that quarter acre block.

We would have needed about ten acres and we would constantly be requiring yet another ten acres every thirteen years. That's almost an acre per year per car. Growing sugar cane to produce ethanol would require one acre per car, so two acres of a sugar cane farm could run both our cars for ever.

But let's look at some researched documentation on tree growth. Dr Peter Attiwill of the University of Melbourne and the late Geofrey Leeper previously Professor of Agricultural Chemistry, University of Melbourne wrote *Forest Soils and Nutrient Cycles*. The book is an excellent analysis of forestry soils and timber growth. They report on growth rates of the relatively fast growing *Eucalyptus delegatensis*. Their figures show that an acre of forest containing young vigorous trees will absorb 10 tons of carbon dioxide per year for about thirty-five years. After which its absorption rate will then stop. Then another acre would be needed.

For every person in a Western society who drives a car we would need to plant two acres of trees tomorrow morning (0.8 ha). Maybe then we could continue to use fossil fuels at the Kyoto Protocol recommended 1990 consumption rate. In addition, for every person in the society not even driving a motor vehicle we would need another one acre of trees also planted first thing tomorrow morning. Thus the world would need two billion acres or nearly one billion hectares of new trees to be planted tomorrow just to stay at current CO_2 levels. Remember CO_2 levels now well exceed even the high 1990 levels.

To continue to use fossil fuels at any of these rates, every farmer in the world would have to switch exclusively to using their tractors and trucks and all their equipment to planting useless trees until the world ran out of farmland and everybody starved to death.

Most of Australia is either outright desert or too dry to support forestry. Australia is about the same land area as the US mainland with a population of just under twenty million. So Australia's population is a little less than that of Venezuela and about half that of Colombia.

An optimistic estimate of the area suitable for planting these trees would be about 5% of the national total. That's an area of just 85 million acres (39 million hectares). Most of this area is already used for agriculture, so we would need to tie up nearly a third of the nation's agricultural land to grow enough trees to continue to run just Australia on fossil fuels. Actually a lot more land would be required, for as the trees grow they need to be thinned out, this being essential forestry practice. All things being considered it makes fossil fuels an extremely expensive energy source.

To buy the seedlings, dig the hole, plant the tree and water each one several times is going to cost at least a few dollars per tree. Maybe five dollars, maybe ten dollars, but certainly the cost will not be much less. Nationally, that would be between $75 billion and $150 billion for a population

of less than twenty million people. It can never happen, and it will never happen, and of course it should never happen.

Most people I talk to who are familiar with tree planting and growth, say that without constant watering they would expect at least half of the trees to be dead within twelve months of planting. So we would need to double all those figures. Then of course we would have to repeat the whole exercise on new land every decade or so, and energy demand increases have still to be factored in.

Just to produce the seedlings would be a massive task. The entire output of all the forestry nurseries in the US is only 850 million seedlings per year and the US has a much bigger problem than we have in Australia.

A few years ago, a much publicized and incredibly expensive campaign was launched by the Australian Federal Government to plant one billion trees to "enhance the beauty of the country and to minimize the effect of our greenhouse gas emissions". It's a drop in the ocean of what is required, yet even this multi-billion dollar political public relations fiasco is frightening in its useless enormity. The concept promoted seems almost deliberately structured to grow trees that are never expected to be harvested. The plan was definitely structured to avoid the production of useful forestry timber.

In this exercise, the Australian people were asked, or told, to fund a mad scheme designed to tie up valuable agricultural land forever, a scheme to produce an un-harvestable and virtually useless product. In all of this fiasco, the fossil carbon companies must have been very proud of their lobbying efforts. Of course it is possible they had no part in, and no influence on this ludicrous government initiative. Maybe they were just plain lucky!

Planting such trees to solve the problem of Global Warming is utter nonsense. The concept is promoted to confuse and placate responsible and concerned citizens and further the interests of the oil and petrochemical producers. No matter how rough the calculations might be and how much the numbers are massaged, the concept of growing billions of trees is ludicrous.

STRATEGY 45

CLAIMING TREE PLANTING CAN PREVENT SOIL SALINATION

An objective of the agrochemical industries has to be to have the public believe the myth that tree clearing causes salination. Trees are supposed to suck up water and thus keep salt water tables from rising. The corollary being that planting millions of worthless trees will fix the problem.

It is next to impossible to grow commercial timber in salt laden soils. Any trees that grow are always next to worthless. Worthless or not they could never be harvested, for that would defeat their ostensible purpose. Therefore if we have thousands of acres of useless and unusable land and the tree planting myth somehow worked, we would still end up with thousands of acres of now very costly, useless and unusable land. What is the point in spending the national wealth on changing land that is useless because of salt, into land useless because of trees?

What are the motives behind the salination fiction? The benefits to the agrochemical producers are twofold. It is wise for them to support the myth that tree clearing causes salination, and tree planting will cure it.

Firstly, what gets buried is the facts, and the truth and the reality that worldwide soil fertility is being destroyed by mono-cropping, incorrect cultivation practices and excessive use of agrochemicals. But the agrochemical companies want their sales to increase. The second reason to concentrate on the tree fiction is that if it is implemented, the excessive planting of useless trees will very significantly reduce farmland areas. This will force up land prices, and using "conventional agriculture", it will justify their marketing plan forever more intensive agriculture and expanded use of agrochemicals.

Planting thousands of useless trees will waste our land, not save it. For as long as the sickly trees might stand, the land becomes locked away from any sane and sensible use. The details of deterioration of agricultural land by salt poisoning

and its restoration are discussed in Chapter 7. Here is a short summary.

* Salt, which was once safely chelated within the subsoil, is released by the breakdown and destruction of soil humus.
* Any rise in the water table, whether natural or irrigation-induced, carries the released salt upward to the root zone along with any salt occurring naturally in the ground water. The salt kills the crop.
* Salt, as a minor constituent within the usually excessive quantity of irrigation water required for crop growth in infertile soil, is progressively added to the soil and subsoil.
* Trees cannot solve the problem in any way, shape or form.
* Lowering the water table does not remove the salt – only restoring soil humus levels and gentle percolating water can do that.

Trees are of little value in increasing soil fertility. Their supposedly marvelous ability to drain away excess ground water is a fiction, or at least a massive exaggeration. Many common crops have larger leaf areas and consume greater quantities of soil moisture than trees. A good healthy crop of lucerne (alfalfa) will consume many times more soil moisture and in consequence lower water tables more than will almost any permanent stand of trees. We should also realistically appreciate that neither trees, nor lucerne, like to partake of salt-rich water in a high water table. The limited number of plant species that will grow in salty soils are rarely of commercial value. Their one value is that they can produce the humus to commence soil regeneration and land value regeneration, but enormous quantities of chemical fertilizers are sold to farms in the world's irrigation areas.

The myth that trees can lower water tables and prevent salt buildup in agriculture, benefits the agrochemical industry. The agrochemical industries know that this myth must be promulgated throughout society and hopefully even become one of those "known facts". And they seem to be definitely succeeding. It is part of their frighteningly logical and never-ending campaign to reduce available agricultural land areas. It is their marketing strategy to encourage ever more intensive type farming practices that, they maintain, depend on ever-increasing chemical use, with of course hydroponics as their ultimate endgame.

Simple changes in farming techniques that increase soil fertility and soil organic matter, instead of techniques that decrease soil fertility and soil organic matter, will easily solve the majority of the world's soil salination problems. This is not the way the petrochemical companies want it portrayed.

STRATEGY 46

CLAIMING TREES STOP SOIL EROSION

This ploy is to massively reduce agricultural land areas by promoting the idea that trees conserve soil.

The concept of tree planting conveniently dissociates declining soil fertility from increased soil erosion. By these means the idea of overuse of agrochemicals and their unfortunate results is removed in the public mind. Erosion is blamed on tree clearing rather than agrochemicals and reduction in soil fertility. By these means agrochemical sales are maintained and the concept of soil fertility loss is replaced by the concocted concept of tree coverage loss. In this way good agricultural land on which there are any visible examples of soil erosion can be fenced off and, as is often the misguided practice in Australia, planted with "native vegetation".

In inland Australia what has come to be called "native vegetation" is in fact hardly worth replanting. The stark reality is that the native vegetation of most of Australia is the sorry result of 50,000 years of human intervention with fire. Native vegetation is what didn't become extinct during that period. If replanting is proposed then what should be replanted, unfortunately no longer exists. What the country looked like 50,000 years ago is unknown, and obviously can never be reconstructed.

Unfortunately, once the scrub or bush or a few sorry trees do get established, the ideal opportunity

for applying soil enhancing agricultural techniques becomes unavailable. A farmer, who even attempts to clear this useless regrowth to improve his soil and his land is loudly criticized and derided as being irresponsible. That farmer is actually improving the wealth of the nation and the environment of the planet and yet he is scorned. Manipulated government legislation is created to prevent tree and scrub clearing and this results in locking good land away forever; all for no sane nor sensible reason.

The end result of the "trees can stop erosion" concept, as always, is reduced agricultural land area. Chemical based agriculture, along with soil inversion tillage, is responsible for the erosion. It has nothing to do with trees. Trees don't produce rich soil. Trees don't manufacture soil, and they never have.

The richest natural soils in the world are invariably the soils produced and sustained by our planet's edible grasses. Grass makes soil. It is the grasslands of the world that nourish the vast majority of advanced life on our planet. The soils of the savannas, the steppes, the prairies are the world's richest soils, and they were created by grasses directly from decomposed rock.

Grassland soil constantly erodes but at a slow rate. A rate that over time constantly exposes a regular supply of mineral rich subsoil to the plant roots. So the grasslands stay rich. Rapid and harmful erosion in these soils only occurs if they lose their rich organic matter content. The fibrous nature of soil organic matter is what binds soil material together and thus controls erosion rates. These materials give soil the texture and feel agronomists describe as good "soil structure". That texture is the feel and the effect of decomposing grass roots. Trees don't have that effect on soil.

The truth is that trees, in isolation or semi-isolation, are worthless for erosion prevention. Even tree roots themselves on a farm often have to be protected from the very erosion they are claimed to prevent. A tree, newly planted in an eroding area, will have a poor chance of survival as continuing fast erosion exposes its roots and soon kills it.

In a forest it is the dense mat of dead and rotting tree litter found under the canopy that is the erosion preventer, not the trees. A good carpet of grass does a much better job, and a good carpet of grass is more useful than covering the earth with totally unpalatable, dead and rotting tree litter. The highly developed herbivores of the world rarely live in forests. They would starve.

Short grass growth cycles can also rapidly and dramatically increase soil humus levels and so combat Global Warming. Trees can't. Grass will always prevent soil erosion. Trees won't. If a land surface is seen to be eroding badly, it will be found to be in a condition created by deterioration of the soil structure, and this usually results from the deterioration in the nature of the grass cover, not the tree cover.

Trees very often produce natural poisons that kill nearby grass plants to prevent them competing for soil nutrients and water. Also simply by producing shade, trees will reduce the growth rate of any nearby grass plants. A tree planted in conditions where rapid soil degradation is established is more likely to exacerbate erosion problems. It won't fix it. Only grasses can fix it. Trees and grass are enemies and are forever in competition for resources.

Correct cultivation, and the introduction and management of suitable pasture grasses will definitely re-establish high fertility levels and good soil structure. After the soil has improved then a planted tree will thrive. Although, unless its timber is required, or the tree is a convenient shade for animals, or it forms part of a windbreak, planting a trees is a totally pointless exercise.

There is one notable exception where trees do have a very useful and beneficial function in the prevention of an unusual type of land erosion. With some geological structures on steep hillsides, mud slides or slips can occur. The removal of large quantities of deep-rooted tree varieties can cause slips. A "slip" results when a fairly large area, often forming one large slab, on the side of a hill becomes dislodged and slides some distance downhill. Even small slips, or mud slides may contain ten thousand tons of earth and move a

hundred yards (100 m) or more in a few minutes. Uncharacteristic prolonged heavy rain can initiate a slip. Recent rain-induced mudslides killed thousands of people in South America. Mudslides in Southern California are regular killers.

A small area near the town of Picton in New South Wales has a geological form susceptible to slips. The country is very steep with very deep soil occurring on the steep slopes. With excessive rain, the hillside soil can suddenly slip, and slide down the hill face in an enormous sheet. These slips near Picton are visible and quite noticeable from the main highway.

Deep tree roots can bind this soil material and minimize the slips. Slip country or country prone to mud slides is rare, but the slips and slides are always dramatic. The tree lovers like to use them to prove that the whole world should be planted with trees for erosion mitigation and ignore the fact that the unique geological formations necessary for slides are rare occurrences.

In photographs trees look better than grasses. It is only farmers that are aware of the pointless waste in planting huge quantities of useless trees. The agrochemical industries, helped by their save-the-tree pawns, use stunning photography and vague but emotive environmental claims to mask these inconvenient truths in their never-ending marketing campaigns.

STRATEGY 47

MAKING TIMBER HARVESTING SOCIALLY UNACCEPTABLE

The fossil carbon advertising gurus love to take dramatic and emotive footage of trees crashing to the ground. The shots show native animals scampering for safety, or even crushed. They invariably depict timber workers as evil, uncaring and avaricious. Another gimmick they love is to attribute to trees qualities that render them somehow different to other plants. It suggests that trees have some magical sense of nobility about them. In effect they portray trees as having a living soul. And it's done well. It's all very powerful stuff, and it is often very hard for us to remain objective.

Man seems always to be in awe of anything that has a life span longer than his own, especially if it is more massive than himself. This very human characteristic is an excellent basis for manipulative emotionalism. Trees sometimes can be very big plants. In size and weight, they often totally dwarf human beings. These features, used carefully by the people in the advertising department, can be made to inspire awe, reverence, respect and concern for big trees. And so we are conditioned to almost love these "noble elephants of the vegetable kingdom." As one piece of well oiled copy described them.

Hugging a cabbage, or chaining oneself to a tomato plant, doesn't have the same impact. Although there is little difference in the logic.

Using these ploys means that the threat of wood to the whole range of energy consuming alternatives is felled in one blow. The alternative argument becomes a complex and protracted debate over the pros and cons of timber versus other materials. The single blow strategy is simple, more sweeping and less open to debate. By this means the incredibly competitive nature of timber never gets a mention. Timber harvesting is stopped with a very inexpensive marketing campaign.

The oil driller and the coal miner have, in comparison, a beautifully constructed, very marketable, diligently manufactured image. Tough, strong, courageous workers they are. Combating desert heat, battling the ever-increasing ferocity of North Sea storms or combating the terrors of the deep underground; these men are bringing us the energy to create a bright new future.

The reality is that the oil-gas workers and the drillers are the conscripted front-runners in the fossil carbon lobbies's deadly hit squads. The companies that by their very existence are killing our atmosphere, wreaking havoc with our weather, destabilizing world climates, destroying our crops and forcing millions of people into unprecedented drought and flood initiated starvation.

The campaign to present the actual timber harvesting as evil and un-godlike is the other

ploy. Creating the image of the timber cutters as a dying breed of uncaring, irresponsible, villains, is achieving remarkable success. Children's television is rampant with these brain-molding messages. Some Australians might remember such blatant image manipulation in the theme song from the Blinkey Bill television series. Similarly, the movie, *Fern Gully*, could well have been produced by the petrochemical industries. Listen to the words of the song "*Toxic Waste*" from its soundtrack, it could easily be an oil company anthem.

Such messages are so wrong. It's the timber getter, not the oil driller, who is the real hero in saving the planet.

STRATEGY 48

ESTABLISH WOOD AS A SOCIALLY UNACCEPTABLE PRODUCT

The appreciation of timber as a material of true worth and delightful beauty has to be destroyed. Rainforests produce some of the most beautiful timber in the world. If beautiful timber products that you have in your home can be insulted and criticized, portrayed as products of Western Man's greed, products of the wanton destruction of "God's rainforests", then the petrochemical marketing people will have won. The use of plastics and other oil dependent materials will dominate our civilization; the richness of human life will be poorer for it. If people can be made to somehow feel vaguely uncomfortable, or embarrassed, for owning or using timber and wooden products, then the fossil carbon industries will receive a tremendous marketing boost.

If wood is "God's own plastic", then making wood socially unacceptable is one of the greatest examples of orchestrated public opinion modifications of the twentieth century. It ranks alongside the creation of the negative images of nuclear energy and the created fear of white asbestos. Such blatant false image building should rankle in all of us.

When we are unaware of the facts and do not take the time to question what has become dogma, it becomes almost impossible for us not to be affected by the force and power of image-makers and their anti-timber campaigns. The manipulation of human attitudes towards timber and forests has been so successful that an environmental report published in the United Kingdom proudly claims that retailers and consumers are refusing to buy products made from tropical timbers. Thin veneers of teak and mahogany covering the bare plastic is portrayed as environmentally responsible. Many furniture manufacturers have switched entirely to plastic and aluminium to cater for this green absurdity in the market place.

STRATEGY 49

THE SLOGAN-DOMINATED CULT OF RAINFOREST PROTECTION

This is another ploy that illustrates how non-thinking environmentalists are manipulated and cajoled into fostering the aims of the oil-gas lobbyist. It has almost become a form of twisted "common knowledge" that the so-called "destruction of tropical rainforests" (or any rainforest for that matter, or even any forest), is the worst ecological disaster of the 20th and now the 21st century. It is happily claimed by the fossil carbon companies' public relations people to be a key factor in every serious environmental problem facing the planet: mass extinctions of species, shortages of "natural resources", poor air quality, Global Warming, massive human displacement and suffering, and anything else that comes to mind. It's all fiction; the facts don't support any of the claims.

The fossil carbon industries have two compelling motives for this campaign of disinformation. Of course one is to minimize the use of wood. The other is to minimize the availability of land to ultimately encourage intensive agricultural practices, but most importantly to hinder the production of sugar. Ethanol is the fuel that must and will ultimately replace petrol. Sugar cane is currently the best and cheapest raw material from

which to produce ethanol. Sugar cane grows best in the tropics and semi-tropics – precisely where rainforests cover the land.

All these supposed "truths" about rainforests and deforestation, are in truth, a pack of untruths. They are riddled with manipulated disinformation and wild and woolly exaggerations. It is carefully orchestrated public relations image building to sell more petrochemicals, more agrochemicals, more plastics and more fossil based energy. For "Big Oil", it is a fabulously successful marketing ploy to be fostered and encouraged, ad nauseam.

What is never claimed, never mentioned, and never hinted at, is that tropical rainforests contain a huge quantity of beautiful and immensely versatile wood, and that wood, in so many cases, is plastic's greatest competitor.

It is never mentioned that tropical timbers regrow, and tropical forests regenerate faster than any other ecological system on the planet. It is never argued, never suggested, never promoted that the most responsible environmental thing to do with tropical rainforests is to periodically harvest the timber.

To waste the wood and to let it rot is environmental negligence of criminal magnitude. It is utterly illogical and sickening to imply that the key to preventing Global Warming is to prevent clearing of tropical rainforests, and to cease harvesting tropical rainforest timbers. It's a blatant public relations lie.

When trees die they decompose and turn into atmospheric carbon dioxide. This is true of all trees whether they be in boreal forests, temperate forests or tropical rainforests. Look at the logic: if they did not turn back into carbon dioxide then where is all the litter? After the thousands of years that many of these forests have existed, the litter would have to be hundreds of feet thick. But the ground litter in rainforests is only ever finger deep!

Can rainforests be useful to us as carbon sinks to mitigate Global Warming? No way.

A carbon sink, like any sink, like a kitchen sink, must absorb things and not return them. A tropical rainforest is certainly a storehouse of carbon, but the storehouse is full. It's been full since the first crop of trees grew to maturity in them many thousands of years past; probably many millions of years.

It is common knowledge that trees extract carbon dioxide from the air. What is not so commonly known is that overnight they feed carbon dioxide back into the air. Trees are living creatures; they metabolize sugars to stay alive; a process that requires oxygen. That's what they breathe in at night. They also live in symbiosis with mycorrhizal fungi, which live around their roots extracting minerals and nutrients from decomposing organic matter. Mycorrhizae breathe oxygen and expel carbon dioxide to perform their function. If you cover the soil around a tree with plastic or flood its roots for a long period the mycorrhizae will die and so will the tree.

Unlike us, plants and trees make their own food sugars from scratch using photosynthesis. It is this process which extracts carbon dioxide from the air and releases oxygen. Photosynthesis stops as soon as the sun goes down, or in the case of deciduous trees, whenever the tree loses its leaves. However the trees remain alive, consuming the sugars stored in the sap. Maple trees are an excellent example; they store large amounts of sugary sap to tide them over the long cold winters, and early Canadian settlers learnt to tap into this resource for the same purpose – hence maple syrup.

For a young vigorous tree, growing in plenty of sunlight, the amount of carbon dioxide absorbed is much higher than the amount released by the tree's metabolism, and the difference ends up stored as wood. But only while the tree is growing and enlarging. The actual heartwood of a tree is dead. As trees grow bigger and older, more often than not the heartwood begins to rot. Some big old rainforest trees are completely hollow. As the heartwood rots, stored carbon is released as carbon dioxide. The overall result is that a fully mature tree, in which the mass of wood is no longer increasing, releases as much carbon dioxide as it absorbs. If the heart is hollowing out the mass of wood will actually be decreasing. The tree then becomes an overall source of carbon dioxide, not a sink.

Measurements by Charles D. Keeling and Stephen C. Piper of the Scripps Institution of Oceanography in La Jolla, California and reported in the October 1998 issue of *Scientific American*, not only confirms the above but indicates that tropical rainforests are now tending to become a source of carbon dioxide, not a sink! The recent development of inconsistent rainfall patterns stops rainforests from being rainforests. The total mass of vegetation within them declines. That's Global Warming in action and feeding itself.

The only way a rainforest is of any use in the prevention of Global Warming is to harvest its timber before the trees die and rot. The carbon dioxide is then not discharged into the air but is locked away as beautiful timber furnishings. Those furnishings are an ideal, practical, man-made "carbon sink".

It required great ingenuity for the fossil carbon lobby to forestall such a common sense appreciation of the value of wood and timber. But they did it. The vast majority of people now really believe harvesting rainforest timber is gross irresponsibility.

Weather patterns in the tropics are not generally as vulnerable to shifts in ocean circulation patterns as those in the more temperate regions. Tropical jungles and rainforests have therefore developed into the most long-term stable terrestrial ecological systems on the planet. Most tropical jungles have been completely stable for tens of thousands of years. Many of these jungles would have been little affected by the ice ages that were felt so harshly in the higher latitudes. The evolutionary changes stimulated by climate changes in higher latitudes are significantly reduced in tropical rainforests. Relatively speaking, tropical rainforests are now evolutionarily stagnant.

The very stability of tropical rainforests has unfortunately ensured the destruction of the tropical soils by the one-way process of soil leaching. Leaching is the process where minerals are washed from the soil by an excess of water. Leaching occurs in all soils to some extent, generally the higher the rainfall, the higher the risk of leaching. At the same time, in all soils, a slight amount of erosion occurs. This constant gentle surface erosion ensures that an unending supply of mineral-rich subsoil is always becoming exposed to the biological activity stimulated by oxygen and powered by sunlight. Thus new mineral rich topsoil is constantly being formed. The minerals thus exposed counteract the losses due to leaching. Slight soil erosion is therefore essential in sustaining healthy advanced terrestrial life. In the wet tropics and sub-tropics, sunlight is in abundance and rainfall is excessive. So soil leaching is inevitable due to the high rainfall, but unfortunately where the super-dense rainforests grow and litter covers the ground, soil erosion is near zero.

The deep litter covering the rainforest floor eliminates soil erosion so completely that the normal constant exposure of deep mineral-rich subsoil to the surface environment is totally prevented. The constant process of growth, decay and regrowth and the high rainfall gradually de-mineralize the soil. See Chapter 6 for a more detailed discussion.

Rainforest soils are the poorest most worthless soils anywhere on the face of the planet. They are portrayed as "fragile" but they are certainly not fragile. Quite the contrary, their very worthlessness makes them almost invulnerable to change. Only hot sandy deserts have more impoverished surface soil material. In many ways rainforests are simply huge green deserts.

The 21 September 1996 issue of *New Scientist* reported on the poor nature of rainforest soils resulting from this leaching process in a comprehensive cover of agriculture in the Amazon. It was pointed out that slash and burn, with its inherent slight erosion, is actually a sustainable agricultural practice for the Amazon and other tropical rainforests. The system has operated perfectly well for centuries, long before fossil fuels began to destabilize world climates. One of the articles was even captioned "Slash and Grow".

The pressure to prevent the use of high rainfall tropical land is ongoing. To further prevent the concept of harvesting and regrowing boreal forest

and rainforest trees, a new marketing buzzword was generated, "old growth forests". "Old growth" was an old and rarely used term, first seen in the late 19th century and then totally re-invented by the advertising copywriters. But "old growth forests" and their "protection" has certainly been processed into a new and cleverly emotive, although pointless cause.

The argument dreamed up to market the "old growth forests" concept says that when an old tree falls over and dies, it forms an important link in the chain of the forest ecology. The fallen tree clears the forest canopy for a short period and native animals are then supposed to move in and live under the fallen branches. One might ask, is there something different if the tree is chopped down? The canopy cover argument is no different, and surely the very few animals that do inhabit dense forests can take up residence under the smaller scattered branches. Or is that too simple?

Tropical jungles are a symphony of chirps, and whistles, and screeches, and haunting bird calls, a symphony of life – but only in the movies.

The reality is different. Jungles and tropical rainforests in the real world are silent, still, lifeless places, with a constant smell of rotting vegetation. There are few animals and most of these are small. Good nourishing food is difficult to obtain in an environment where the soil is so leached and depleted.

Walking over the ground in a tropical rainforest, the first thing you notice is the dark and eerie quietness. There are no sounds. Then you notice what else seems to be missing. There are no plants. There is no greenery. There are hardly any insects. You have to dig into the carpet of dead litter for termites and centipedes to find any of the tropical rainforest's much-publicized biodiversity. So little sunlight penetrates this dark cavernous interior that plants simply can't grow there. All the greenery, and any life in a rainforest is in the dense canopy ten stories above your head. And even in the high canopy life is still sparse, for the green treetops contain few nutrients, few minerals and few proteins.

Birds are about the only common large life form that you will find, for they can range over a huge area to find enough food to survive. The so-called richness in tropical flora and fauna is always confined to areas where breaks occur in the monotony of the forest. Rich life only occurs along rivers or near cliffs, or in the rare grassy clearings, or in the flood prone valleys where the smothering effects of the endless canopy is broken. That is the only place where nutrients and minerals can enter the biological cycle. That's where the monkeys live. We are fed a constant barrage of claims that clearing rainforests will lead to some horrendous "mass extinctions". We are fed suggestions, innuendos and suppositions but we are never let see the facts.

There is now a sizeable worldwide lobby demanding rainforests be placed out of bounds for all, and for ever. "Shortages of natural resources" is often vaguely thrown in by the oil-gas marketing gurus and their green pawns to somehow justify this fencing off and locking up of tropical rainforest. The only significant "resource" is the timber the forest contains. If this timber, by political and environmental manipulation, is mandated or legislated to rot on the tropical floor, then by definition the tropical rainforest cannot in any way be described as a resource. By definition, a resource is something of use or of value. Locked up rainforests become nothing more than protected habitats for a great diversity of termites.

It is constantly argued by those who want rainforests locked away forever, that just possibly, somewhere in those endless green forests is some plant, some insect or some fungus that contains some magical drug, "a magic cure for cancer".

That is a twisted and sick scenario. The following is typical of what really happens. In the January 1998 issue of *Science*, Vol. 279, it was reported that John Daly, a chemist at the National Institute of Diabetes and Digestive and Kidney Diseases in the United States, made an incredible discovery in 1976. He isolated a chemical he called "Epibatidine". It came from the skin of a frog in Ecuador. Ecuador straddles the equator on the western coast of South America; it has a population of 12 million. The average annual

rainfall in the northern Ecuadorian coastal areas is around eighty inches (two metres). That's classic rainforest country. The frog was called *Epipedobates tricolor* and that is where Daly derived the name for this amazing chemical.

It seems Epibatidine is an incredible painkiller. It is two hundred times more effective in blocking pain than morphine. Epibatidine was found to work through a totally different set of receptors, and therefore it was unlikely to have the deadly addictive properties of morphine. When the frog was grown in laboratories, it didn't produce the miraculous painkilling chemical. More research was necessary. But now the almost out of control "save the rainforest" pawns decided their political domain was threatened by independent researchers. They reacted. To quell their protests and environmental screams, the frog in consequence, was placed on the "endangered" species list. The chemical in the frog's skin could no longer be studied.

A few tiny, irreplaceable samples of the chemical were refrigerated and stored. Nothing happened for ten long wasteful years until techniques in nuclear magnetic resonance spectroscopy became available to determine the structure of the stored chemical. Finally, research in this substitute for morphine was able to recommence. Variations of the chemical were produced and tried on laboratory animals, and finally variant ABT-594 was selected for intensive study. Pain was stimulated in rats in a variety of ways, and the chemical's pain relieving and suppressing characteristics were studied.

Spinal pain was reduced as dramatically and as effectively as with pure morphine. Even more startling, it was found that benign sensations such as touch and the feeling of warmth were unaffected. ABT-594 did not sedate test animals. They remained awake and alert. Normal respiration was not repressed as happens with morphine. Ten days of particularly high doses in test animals, when stopped, did not produce suppressed appetites and withdrawal symptoms. I believe it is currently ready for testing in humans.

Around the world, how much crime has been committed, how much suffering has been felt, how many of us have became drug addicts because a safe alternative to heroin and morphine, an alternative with great promise, was delayed for one entire human generation for no sane reason whatever. We still can't get supplies of the original secretions. We only have the synthetic versions.

If we can't use the forest, we won't go there. Why would we? And nothing will ever happen. And the oil companies will have won their battle. It is blatantly irrational to preserve millions of square miles of rainforests in the hope that they might contain some "miraculous cure for cancer" if research into that cure is not allowed.

"Deforestation" has been taken by the manipulators of human opinion, and turned into a dirty word everywhere. Yet deforestation was an essential part in the process of creating our rich and prosperous societies. We used the wood to make useful articles, houses, furniture and tools, and in the process we created agricultural land.

Most articles on tropical rainforests show consistent irrational bias. They are also pathetically emotive. It is always "timber companies" chasing "quick profits" by "mining" tropical timbers. "Swarms of people hungry for land" follow the bulldozers while they "rip and slash" their way through the "pristine" forest. The writings always reek of unfettered emotional manipulation.

It is also implied, or presumed in these stories that the rich and developed nations of the world achieved their high standard of living by viciously exploiting and destroying the natural wealth of the poor nations of the world. Mostly this is rubbish. Hard work, mechanization, the right to own land, free enterprise and the constitutional right of a people to sack their own government – history shows that's how rich nations became rich.

The resources that were used to create rich nations came from within their own borders. There were simply not enough transportation and port facilities available to ship in from "poor countries" the raw materials needed to create their immense wealth. Nor did the world's developed nations receive one cent in foreign aid to help build their societies. They pulled themselves up by their own bootstraps and they should feel proud of their

accomplishments.

The members of affluent societies must not allow themselves to be manipulated into feeling embarrassed because of their own accomplishments, as so many uninformed, self-righteous people would like us to feel. The self-righteous bigots of the world never created anything, neither good laws nor an affluent society. They nevertheless greedily, hypocritically, and invariably claim their share of the wealth and freedom others created.

Rainforests have their few native human inhabitants. It is therefore presumed by these self-righteous souls that regulations must be dreamed up to "manage" the jungle and to maintain the environment for the inhabitants. Environmental organizations then proclaim their particular form of rainforest management, and their form of local people management, all in their own particularly "enlightened" way.

That rainforests should be managed at all, or even conserved at all, is always just blithely assumed.

Other conservation groups argue that under the "stewardship" of the local natives, the forests have been "managed wisely". That the jungle is still there, I presume, is the evidence we are to accept for the presumption. Are we supposed to believe that without such "stewardship" the jungle would not survive? The reality is that jungles persist. Jungles survive despite the natives, not because of them. Jungles are almost impossible to remove and keep removed. And the few indigenous human inhabitants in these jungles have an indiscernible effect.

I know that when the jungle is cleared on tropical Pacific islands, and coconut plantations are established, it becomes a constant battle for the owner to prevent the regrowth of native vegetation. On the flat coastal strips where clearing can be achieved the increased sunlight reaching the ground ensures that plant growth is even more prolific. Constant maintenance and cleaning of regrowth is absolutely essential. I remember in the old New Hebrides, (now Vanuatu) that if a copra (coconut) plantation was neglected for about ten years it became economically impossible to re-establish the plantation. The coconut trees would still be there and could be thirty years old – only half way through their useful production life – but selectively clearing the massive volume of jungle regrowth to allow the individual coconuts trees to produce properly would no longer be viable. It was more economical to start again from scratch. Usually after neglect for twenty years or so, it is generally no longer possible to even find the plantation. The coconut trees are possibly still there – somewhere in the impenetrable jungle.

Jungles always persist and will persist as long as the rains keep coming and persist even as the soils grow poor. Water, air and heat are all that is needed to nourish the never-ending jungle (or using its new title the never-ending "tropical rainforest"). While ever the rainfall is high and regular and the sun shines, rainforests will dominate totally. It is a cliché of those that know jungles that no matter what you try to build, no matter what you try to do, "the jungle always wins".

But probably not against the creeping cancer of climate change.

The reality in large tropical rainforests is that the local natives barely maintain more than a subsistence level. Life there is a constant struggle for survival. Any easily obtainable food supplies and edible game that did exist were long ago exploited to extinction. To the natives, "management" and "stewardship" is not some noble cause, as many proclaim. It is simply staying alive the easiest way possible.

Conservation groups always seem to presume that the natives live happy, healthy, contented lives in a green and bountiful world. It is apparently irrelevant why, by our Western standards their life expectancy is always so amazingly short. Population densities without birth control, as always anywhere, are reduced to survival levels determined by food supplies. Apart from the supply of wood, rainforests really have never been a bountiful suppler of anything. In the jungle, animal or human population densities are always extremely low.

Whenever such natives receive a comp-

rehensive Western education they do one of two things. They either do their very best to avoid going back to their supposed ideal existence, or they go back with the express desire to educate, modernize and change their supposedly happy and bountiful lifestyles to something better. However, the moment this happens, the conservation societies decide that no longer is the native's stewardship of their own jungle to be trusted. Yet surely if the land is to be managed, then with the recent demise of communism, it should be managed, and owned, by "them that live there". Not somebody in some high-rise city apartment.

This however does not suit the oil companies. If the natives owned and managed land, then the three most profitable products to concentrate on would be native timber, ethanol from sugar cane and natural rubber.

It is therefore apparent that "preservation of tropical rainforests" must seem a most worthy cause to foster in the calculating eyes of the petrochemical industries.

The reality of rainforest logging is that if we harvest and log rainforest timbers, the rainforest ecology may noticeably change. However there is a good argument that says that any change will be for the better. Of course this would be totally opposed by oil interests and proponents of stagnation ecology concepts. However to satisfy all it is now becoming obvious that it's surprisingly easy to selectively log rainforests with negligible shifts in a prevailing ecology.

That may be contrary to established dogma but the facts are there. As an example let's consider Borneo. It's a big island about the same size as Madagascar, New Guinea, or Texas. The equator runs right through the island of Borneo. The island is considered to contain the world's richest rainforest. Borneo is therefore a good place to investigate the effects of logging on tropical rainforest.

Britain's Royal Society has a field station in Sabah on the northern tip of the island. The field station is in the Danum Valley, just six kilometres north of the equator. In the late 1980s a team of scientists set out to observe the effects of various logging techniques on these tropical rainforest ecologies. The results were enlightening and quite fascinating.

The primary effect of selective logging in dense jungle is to change the quantity and nature of sunlight reaching the forest floor. The studies were designed, among other things, to determine how this change in light levels affected the forest flora and fauna.

Three of the principal researchers involved were rainforest ecologists. They were Tim Whitmore, from the University of Oxford, Malcolm Press, a plant physiologist and lecturer at the University of Manchester in the Department of Environmental Biology, and Nick Brown, a rainforest ecologist lecturing in the Department of Geography at the University of Manchester.

These people were astute researchers. The tests they designed were sensible and effective. Areas were cleared ranging in size from 30 feet (10 metres) square to 5,000 feet (1,500 metres) square. The regrowth patterns and species were observed over a five-year period that proved ample to draw meaningful conclusions.

What the research showed was that there are two fundamentally different types of rainforest timber. The first is a group generally described as "Climax species". These include most of the dense tropical hardwoods. Their seeds fall to the ground and immediately germinate. Most of them then die from lack of sunlight as only about 2% of the sunlight energy falling on dense tropical rainforests makes it through to the ground. Some of these seedlings, lucky enough to get a few flecks of sunlight, eventually become well-established mature seedlings. If a few branches fall from the overhead canopy or a mature tree topples, these mature seedlings rapidly develop in the sudden burst of additional sunlight. Even then it's not easy as too much sunlight on their dark-adapted photosynthesis system will kill the less hardy. So only the strongest seedlings survive to reach up and annex their own area in the high canopy's harsh and direct tropical sun.

Trees in the second group are generally known as "Pioneers". These trees grow very fast and produce a very soft lightweight wood. The Balsa

wood familiar to model aeroplane builders is a typical Pioneer species.

Unlike the Climax species, the seeds of Pioneer species don't germinate immediately on contact with the ground. They lie dormant waiting for big openings in the overhead canopy. Also unlike Climax seedlings, Pioneer seedlings need, and thrive, in strong direct sunlight.

In the trials, it was obvious that the larger the area of canopy removed, the more dominant the Pioneer species became. Fauna associated with the Pioneer species also dominated.

As the canopy re-established itself, ground level sunlight diminished; the sunlight flecked, semi-darkness returned and the balance shifted. The ground level environment again favoured the development of the Climax species and their dependent fauna. The Pioneer species in turn languished.

The results of the research show that logging in tropical and subtropical rainforests, while changing the current ecological balance, almost instantly establishes the opposite balance. The removal of all timber coverage is described as clear felling. The results also showed that, except for very small areas, clear felling severely hinders regrowth of the more valuable tropical hardwoods of the Climax species. Clear felling exposes the vulnerable hardwood seedlings to direct sunlight which kills them. Since the Climax species lifecycle does not include a dormant seed process, some mature Climax species trees must be retained for seed and seedling production. Once the softwood Pioneer species become well established, the hardwood trees then follow.

Thus total clear felling of large areas of high rainfall tropical forests is counter-productive to timber production. A land owning timber producer would therefore retain some dispersed hardwood trees for this necessary seed production. This is exactly the same as grain farmers keeping seed for next year's planting. Unfortunately when the land is owned by the state, such simple practical responsibility soon becomes a bureaucratic quagmire.

In the trials in the Borneo rainforests, it was found that within six months, small cleared plots were well covered with Pioneer species. Within two to three years a canopy of Pioneer species shaded the ground so effectively that, provided there was a seed source close by, the hardwood Climax seedlings dominated again.

Another report in an August 1998 issue of *Science*, Vol. 281 described more findings on the impact of logging in the Borneo rainforests. The report was detailed and well documented. The researchers observed and studied the effects of an actual logging operation that was described as haphazard and indiscriminate. Considerations of biodiversity did not appear to be an issue for these loggers. Yet within eight years, regrowth and reforestation was total. Biodiversity was unaffected.

Rainforests are great survivors and have been for millennia. Again, "the jungle always wins."

Logging is widely publicized as the "kiss of death" for rainforests. This is totally untrue. Maybe a common sense proviso might be added that only useful and mature trees should be harvested or felled, or with clear felling some Climax species trees should be retained. Even with wildlife, fluctuations in population densities can be quite dramatic, but no studies support the much-touted concept of inevitable desolation,

Research on rainforest population and density changes, conducted by Andy Johns and Frank Lambert, both of the University of Aberdeen, showed that very few species of vertebrates are entirely lost in an area with even severe logging operations. Again, this is in complete contradiction to every media and public relations pronouncement. Their studies in fact showed that the large herbivores thrived in the Pioneer species dominated regrowth. Populations of elephant and deer almost exploded. However bird species with highly selective food requirements often only survived well in small selected pockets untouched by the logging operations.

Jeremy Holloway of the Natural History Museum and Ashley Kirk-Spriggs of the National Museum of Wales are entomologists. (Entomologists study insects.) Their research on insects showed the same overall pattern.

It seems obvious that man can easily affect the ecological balance of a rainforest. It is also obvious that the result is simply the creation of a new ecological balance. There is change but no loss. Usually the balance swings back. At most it is a philosophical argument, whether the old ecological balance or the new ecological balance is more desirable. Also whose definition of desirability are we to pander to and why?

They are all strange arguments, for worldwide we are not actually losing forest density at all. Resources For The Future is a think tank in Washington DC. Roger Sedjo of that institute has been studying the relationship between atmospheric carbon dioxide build up and deforestation. His particular findings add a much needed influx of common sense and illumination to the esoteric "deforestation debate".

In the early 1980s anti-deforestation propaganda claimed four billion tons of carbon dioxide were released into the atmosphere by the destruction of the world's forests. Roger Sedjo conducted what is possibly the first global analysis of forest destruction and regrowth undertaken. Despite all the rhetoric, he shows that the truth is that since 1920 timber regrowth in the US has substantially exceeded deforestation. In 2001, United States forestry nurseries produced 850 million seedlings per year; these seedlings are planted, grown and harvested to produce timber. All these trees sequestrated carbon dioxide. Figures for Canada are similar. Even in the old Soviet Union regrowth and replanting exceeded deforestation.

He points out that it is reasonable to presume that in the tropics, regrowth is already as high as 75% of deforestation. The very considerable forest regrowth and forest plantings in the temperate latitudes then almost exactly balances the remaining 25% of tropical deforestation. Sedjo draws the logical, unbiased and unemotional conclusion that "the global forest ecosystem is roughly balanced".

So it must surely follow that Global Warming can never be attributed to some fictitious massive global deforestation.

The horrendous fires now becoming a regular occurrence in the world's rainforests, caused by decreased rainfalls, are the only things that can significantly diminish world forest cover, and in so doing obviously contribute significantly to Global Warming. Lack of rain makes rainforests flammable and lack of rain is Global Warming in action. It becomes a vicious circle.

A stable rainforest requires a high stable rainfall. Periods of drought, now more severe due to global weather changes, often leave rainforests vulnerable to lightning-initiated forest fires. In the Great Borneo Fire of 1983, 15,000 square miles (40,000 square kilometres) of tropical rainforest were burnt out. Rainforests have to be wet places. Drought induced by Global Warming caused the fires, not some hypothetical mismanagement nor "indiscriminate logging".

The new regenerating rainforest in those burnt out areas would be subject to rapidly changing local ecologies as the forests re-established themselves. And when that new "stability" does become established, it too will have its own uniqueness and its own vulnerability.

In Borneo, in 1997-1998 it happened again. It is now accepted that the severity and the frequency of the fires in the Indonesian islands, especially the island of Borneo, is predominately determined by the severity and frequency of ENSO events. And ENSO events are increasing in frequency and severity as global temperatures climb. The 1997-98 fires spread smoke over the whole South-East Asian region including Malaysia and Singapore. Damage estimates were in excess of US$1.5 billion. Twenty million people were breathing polluted air well above danger levels for months on end.

But again the jungle in Borneo regrows to burn yet again, so why waste the wood?

The Amazon is no different. If atmospheric carbon dioxide levels increase at current rates as will most certainly happen if we don't do something serious about it, then the Amazon basin will simply dry up. All those thousands of square miles of rainforests will die and then surely burn. That comes from a three year, in-depth study, concluded in 1999, by the British Meteorological

Office, Hadley Centre. In the Amazon we are talking firestorms ten times worse than has ever happened in relatively tiny Borneo.

Rainforests and tropical jungles, when left alone, do not produce oxygen for the rest of the world to breathe. They are not carbon sinks; they do not absorb atmospheric carbon dioxide. They cannot reduce Global Warming at all. Harvesting rainforest timber, building things with the wood, and replanting or simply awaiting regrowth, creates a carbon sink that did not exist before. Additionally a huge quantity of plastic and other fossil reliant materials won't get manufactured.

These actions can significantly reduce Global Warming. So that's what we must do.

If the demineralized soil in an area of cleared jungle was actually bulldozed away or allowed to erode away, this would I believe be an improvement. The combination of newly exposed, mineral rich subsoil, tropical heat, high rainfall and grass would very rapidly create incredibly rich and fertile soil. The soil would be better than has existed in those jungles for countless millennia. That new soil fertility building process would be a huge carbon sink, bigger even than any possible regrowth forest. The greenhouse carbon dioxide budget would come out way ahead. The tropical nations, owning the old jungles would now have rich fertile soil on which to produce their crops and feed their people. And as has been noted: If the natives owned and managed the land themselves, then the three most profitable products to concentrate on would be native timber, ethanol from sugar cane and natural rubber.

There is a scenario the oil and petrochemical industries dread and with complete justification. But preventing world climatic chaos is more important.

Right now, for all of us, and for all things that live on this planet, Global Warming is the only environmental issue that has immense and overriding significance. It is the fossil carbon public relations people that have turned tropical rainforests into today's Holy Grails. And the fossil carbon industries are the only beneficiaries in this quixotic quest for the new Holy Grail.

STRATEGY 50

INVENT A BIODIVERSITY CRISIS TO STOP TIMBER HARVESTING, TO SUPPORT WILDERNESS CLAIMS AND TO LIMIT AGRICULTURAL LAND

The energy that ultimately powers all living things on this planet of ours is the energy in sunlight. It all starts because some life forms here can manipulate very tricky photochemical effects and harness this energy to create energy-loaded complex chemical compounds. These then become both the building blocks and the energy packages for all the rest of life on Earth. By bonding and modifying these building blocks even more complex and versatile molecules are produced. These processes can only happen, as far as we know, within and as part of, a whole variety of strange watery soups.

In the sea, which was the primeval soup, all the elements needed to manufacture the needed complex and versatile molecules were there in abundance. On land it was different. Life forms there had to develop the ability to contain their own chemical soup in some sort of membrane, and at the same time to somehow break down and extract the needed elements from nearby hard rock particles. But they did it, and most successfully.

In the process of life, from there on in, all living things grow, thrive and reproduce by eating other living things, or the remains of other living things. These things are their building blocks. Thus more sophisticated creatures could evolve based on a copious supply of highly sophisticated building blocks, both to build with and to dismantle for needed energy.

The off-cuts or the scantlings in the building processes and the decomposed ingredients after energy extracting processes, return to the soil. With these waste products is mixed some decomposed rock particles, then using the energy in sunlight the whole sequence endlessly repeats itself. Within this ongoing process individual life forms constantly change and evolve, or they perish.

The system forms a food chain. Humans, along

with a few other creatures live at the top of the chain.

On this planet life has invaded every nook and cranny where light and moisture can penetrate. More advanced life forms have moved in to every other dark or dryer nooks and crannies is search of shelter and safety.

Some very rare forms found energy and a suitable soup to develop in, near hot volcanic vents at the bottom of deep oceans. On this planet these places are the rare exceptions where the energy to power life is not totally sun derived.

Today, every nook and cranny, every field, every hill, every puddle, every stream and every ocean is occupied by a variety of living things to the maximum extent possible under the given circumstances. All these localized conditions are in a state of constant change; some fast, most exceedingly slow. As they evolve, so the inhabitants evolve or perish. In consequence there is an immense and varying variety of life forms or species on Earth.

Over the last fifty thousand years Stone Age man hunted to extinction a host of these more fascinating and interesting species, especially the big ones. Now, in most affluent societies the extinction rate of such species has dropped to near zero.

Even so, I do not believe that mankind has some ordained moral responsibility to maintain the exact number and variety of species currently existing on the planet. It just seems a sensible and wise philosophy to adopt for otherwise we might be burning bridges. Therefore, whenever it's reasonably possible we should prevent interesting species from becoming extinct.

I believe that if a species is happily living and breeding somewhere on the planet, although not necessarily where it might have lived in some time past, it cannot be catalogued as a "threatened species." To say that kangaroos are now extinct in downtown Sydney or some other suburban areas, is utter nonsense. Actually there are more kangaroos in Australia than people, and probably more than have existed for millennia.

In total contrast to statistical facts, we are constantly told that current extinction rates on the planet have reached some utterly undefined, and always suitably indefinable crisis point. This is simply not true. It is just that the rare exceptions receive exceptional publicity, and always to support some particular hidden agenda.

To say that, because of these rare occurrences the world environment is at crisis point is simply not true. And if it is not true why are we being brainwashed into believing it is?

Again we should ponder what Sherlock Holmes said to Dr Watson, "To solve the mystery, first look for he who will benefit".

The industrial world's massive use of fossil fuels, petrochemicals and agrochemicals is putting the entire world on a road to global crisis. That crisis is Global Warming and radical and unpredictable climate change. Logical marketing for those industries most contributing to Global Warming is to defuse those issues, most effectively by creating some alternative "world crisis". An horrendous threat to world "biodiversity" became that theme.

The promotion of "biodiversity crises" as a concept was brilliant marketing. The concept is impossible to clearly define and can be specifically adapted to suit almost any situation. Biodiversity has systematically been structured to become the "in" word for the environmental crusaders. No matter what human beings wish to do, if it threatens the sale of petroleum or petrochemical products, a threatened biodiversity scenario can be dreamed up and used to prevent it.

The creation of the myth of some pending dreadful biodiversity crisis was marketing magic. It is used with reckless abandon to support the most impossible and impractical demands imaginable. It is used to imply that change in any direction that, in reality is generally no more than away from fossil carbon use, will always be seen in some way as almost criminally irresponsible. With this constant manufactured myth of threatened biodiversity, public opinion becomes controllable and capable of being manipulated almost at will.

It is worth noting that *Webster's Dictionary*

notes no recorded use of the word "biodiversity" prior to 1986. Now the word has become a religion.

This carefully structured "crisis in biodiversity" implies that serious harm is, in some undisclosed way, going to befall the world. It is even suggested that there may be insufficient numbers and varieties of species to sustain a truly ongoing development of planetary life. That is plain ridiculous. It is conveniently forgotten in these arguments that 80% of the species on the planet – dinosaurs included – were wiped out before we got our own chance to evolve. Such wipeouts have happened several times in Earth's long history. The planet didn't stop.

We are told that the Panama Canal was a man made ecological disaster. When the Chagres river, that flows north into the Caribbean, was joined by man made lakes to the south flowing Grande to form the canal the two ecosystems came into sudden and total conflict. Biodiversity should plummet the pundits would claim. But it didn't. Ninety years after the canal was built a study shows biodiversity actually increased significantly. Eldridge Bermingham of the Smithsonian Tropical Research Unit in Ancon, Panama says: "It flies in the face of what was ecological dogma,". See *New Scientist.* 28 August 2004 reporting on *Proceedings of the Royal Society*.

The wonderful thing about biodiversity as a marketing tool is that usually very few of us can make any intelligent judgments as to its actual worth, if indeed there is any. We can't validate or invalidate the myriad of supposed threats. We can however, most certainly be made to feel guilty. And guilt feelings can be manipulated by the public relations gurus with consummate skill.

In an act of brilliant public relations, the marketers, the actual perpetrators of the greatest of all biodiversity threats, manage to portray themselves as warriors in a new "noble cause" to protect our planet's biodiversity. It is worth pondering the theme behind so many of the current oil companies' advertisements. And observe how they structure the themes to suit and manipulate public opinion.

The "cause" of biodiversity is twisted to enforce limitations on total areas of agricultural land with the object of forcing the general intensification of chemical dependent agriculture.

Threats to biodiversity are constantly employed to forestall the adoption of all forms of alternative energy systems.

Promoting biodiversity issues so conveniently thwarts the production of sugar cane and the production and use of the ethanol derived from it. It is also used to effectively prevent the general expansion of sugar cane production.

Biodiversity issues are used to hinder and prevent the harvesting of timber.

One of the greatest advantages of creating and promoting a holy grail of biodiversity is that it supplies an unlimited array of minor "causes" to keep responsible and caring people from concerns of impending climatic chaos. It may well be a "just cause" to argue the maintenance of current numbers of some individual species on the planet. But supporting such causes must never, directly or even indirectly hasten the destabilization of world climates. Especially now when climate change itself has become recognized as the single greatest threat to all our world's total biodiversity.

The biodiversity juggernaut has been expanded to include a concept of the "richness of life on the planet". By so doing it has in too many ways acquired the trappings of a religion where so often faith is far more important than truth. The evidence is overwhelming that this adoption of religion-styled convictions is a deliberate and planned marketing ploy. But irrespective of that, by accident or by deliberation it's what has happened. It is therefore important for us to assess the tenets of this new religion and recognize where truth ends and blind belief begins.

HISTORY OF ECOLOGICAL THEORIES

Arguments and discussions about environmental concepts started in the 1800s. The manipulation of environmental concepts to suit political and industrial motives came later. Unfortunately, with it came blinkered bigotry. The most vicious

example being its adoption by the NAZI party in the 1930s as one of its rallying tools. Creating and manipulating bigotry was one of the hallmarks of the ecofascists' success. Unfortunately unreasoned and illogical bigotry still characterizes many environmental movements.

The general evolution of environmental movements into a money, industry and political power started to seriously self-generate from the 1960s on. It became well established by the mid to late 1970s. It continues to grow bigger in wealth and power – but often not in wisdom.

Ecological theories and ecological concepts, like everything, have their own interesting histories. That history is very relevant to our current thinking and understanding, and so must be understood so as to avoid any uses of it for propaganda and misinformation.

The presumption that variations in biodiversity, or even losses in any current level of biodiversity is in itself a threat, is heavily dependent on the concept of the actual existence of a meaningful "Balance of Nature". Is there really a Balance of Nature, or is the whole concept a fiction? Is the Balance of Nature really the way things actually work in the real world, or do things work otherwise? In many ways, and in many places, a belief in the Balance of Nature along with its holy grail of biodiversity has indeed become a quasi religion. The bright and harsh light of reason and understanding is always the enemy of propaganda and disinformation, so the history of the concepts should not be ignored.

Beginning in the eighteenth century, a theory developed in ecological philosophy that held that a closed independent environment will, over many thousands of years ultimately settle into a stable internally interacting equilibrium. And in consequence, a grand design will ultimately always emerge. In this concept each species is considered to be inter-dependent on all other species and all species then form part of some grand master plan. It is a tenet of these beliefs that man's involvement must inevitably alter and disrupt some delicate balance of interaction and thus destroy the equilibrium. Stability and harmony, it is further argued can only be achieved by removing man (generally considered as modern civilized man) from the ordained ecological equation.

This belief in some pre-ordained Balance of Nature is a major corner stone by which wilderness environmentalists demand that vast areas of our planet be excluded from all future human activity. It is the conveniently chosen doctrine of all wilderness environmentalists. The truth is the utter and total opposite. The whole concept is now no longer accepted nor believed by the majority of well-informed and observant biologists.

A succinct and well-respected analysis of present-day ecological thinking is clearly explained in the book *Chance and Change*, by the late William Holland Drury, University of California Press, Berkley, Los Angeles, California. William Drury was, until his death in 1992 Professor of Biology at the College of the Atlantic, Bay Harbor, Maine. Following Drury's death, *Chance and Change* was ultimately edited and completed by John G. T. Anderson, who also in turn became Professor of Biology at the College of the Atlantic.

Drury was an astute, very hands-on field observer. He was not only a botanist and a zoologist, he was also a competent geologist. These multiple disciplines ensured Drury a broad and balanced comprehension of the biological sciences. He was brilliant and insightful, and he could not at all hold with the concept of some supremely ordained ecological order governing biological systems. Nor was he alone in these (for the 1950s and 1960s) somewhat heretical opinions.

I believe we should all take heed of Professor Drury's and Professor Anderson's thoughts and opinions with trust and appreciation. It is refreshing to observe their insights. In *Chance and Change* we learn of some of the history of the concepts of equilibrium and Balance of Nature theories.

Way back in the mid 1700s, a collection of writings appeared called the *Linnaeus Essays*. These essays had a profound effect on zoological, botanical and biological thinking. That effect or influence has lasted through to this day.

Carolus Linnaeus, 1707-1778, was a religously devout Swedish naturalist who in 1767 also invented a system for classifying and cataloging living organisms. It was called *"Systema Naturae"*. This taxonomy is now the basis of all biological cataloguing around the world.

In 1749 – total unrelated to his *Systema Naturae* – Linnaeus wrote *The Economy of Nature,* in which he outlined the concept of an all-pervading natural equilibrium in nature. In so doing he established a conviction that an all-pervading balance of nature existed. His *Systema Naturae* for cataloguing was good, it was timely and was universally adopted. Unfortunately, carried on its coat tails went his other concept of a supreme balance of nature as proposed in *The Economy of Nature*. Linnaeus' writings were penned well before Charles Darwin's time, and therefore well before it was finally realized that botanic and zoological organisms are actually in a constant state of evolutionary change. It is doubtful that Linnaeus ever considered that evolution was even a possibility. At that time the very concept of evolution would undoubtedly have been a sacrilege. (Even today some still see it as a sacrilege.)

Linnaeus in effect, taught that a status quo of all living organisms existed. He believed that the status quo of life came into being at some original "Creation". He believed the status quo he saw around him would obviously last until the end of time. This belief, this concept, argued a divine equilibrium, a divine Balance of Nature. And this we should appreciate would, most conveniently not in any way conflict with the theological convictions then current, but would reinforce them.

Unfortunately, equilibrium theory with, in effect, its concept of a "superorganism" is still the concept taught in many basic introductory textbooks on the natural sciences. Charles Darwin, in contrast to Linnaeus, emphasized the importance of individual organisms and emphasized the individual's inevitable contribution to continuous evolutionary change.

Darwin still seems to be studiously ignored by disciples of Balance of Nature concepts. Darwinism simply doesn't suit their political agenda.

In *Chance and Change*, Professor Drury categorically states that: "equilibrium theory, the characteristic ecology taught in introductory textbooks, clearly provides the intellectual foundation of politically active environmentalists."

Dating from the early 1900s, what became known as the Clements-Shelford School of community ecologists, believed that an ecological community existed as some form of superorganism. In consequence they believed that removing or interfering with any one particular species within the superorganism would irreversibly de-stabilize the biome. (Biome is a term to describe a major self-contained ecological community, such as some particular rainforest, desert or savanna). At the time and by contrast, the more liberal Gleason School "contended that each species simply fills its own niche, and the coexistence of certain species in communities is simply the result of the similarity of their niche requirements". Drury also notes that in more modern analysis the "typological thinking of the Clements School has since been thoroughly refuted". The superorganism concept and the Balance of Nature concept have now become disproven theories.

It is presumed, quite erroneously, in Balance of Nature thinking that ecological systems, divorced from human influence, achieve a stability by a complex interwoven system of biological and ecological checks and balances. But it doesn't. And it can't. Even with all external (generally presumed to be man-made) influences absent, this still can't happen. For any dynamic system to achieve some form of statistical balance it is obviously necessary for correcting influences to come into play almost as soon as any imbalance occurs. For this to have any possibility of happening in a biological sense, it would logically be necessary for members of the various inhabiting species to all have approximately the same life span. This would seem essential to prevent wild fluctuations in the various population densities. It is exceptionally difficult for the population of a

predator species with a life span of several years to attune to changes in the population of its prey when the prey has a life cycle of possibly just a few weeks. The other way around – with prey with a longer life cycle – would be less stable again. Balance doesn't occur. In the real world, feast or famine is always the norm. It is not benign stability.

Ecological systems, even simple ones, are composed of a myriad of life forms, all interacting, cooperating or competing. The de-stabilizing reality is that life cycles, from plant to plant, animal to animal, insect to insect, bacterium to bacterium, vary so widely, from a few minutes to a few hundred years, that ecological systems are fundamentally inherently chaotic.

Chaos theory therefore becomes the most applicable concept to describe ecological and biological behavior; this is made obvious in current mathematical, statistical and ecological investigations. One of the fundamental principles of chaos theory is that the detailed future behavior of a chaotic system cannot be predicted. Small changes to the starting conditions for a chaotic system lead to large differences in outcome. The first shot in a game of pool is a good visual illustration of chaos theory. Where the balls end up is anybody's guess.

By using reality stretched to extremes, chaos is sometimes explained as the "Butterfly Effect", wherein a butterfly beating its wings in South America can ultimately lead to a hurricane in Japan. It's just that the odds are against it.

Despite this apparent total lack of predictability, chaos theory nevertheless does have its own set of specific and definable rules, and from these, certain types of predictions can be made. Chaos theory generally applies where statistical rules cannot.

One rule in chaos theory is that the frequency of fluctuations in a chaotic system are scale dependent. That means that the size of a fluctuation determines the frequency with which it can be expected to occur. Applied to ecological systems it means that small fluctuations in populations will occur often and large fluctuations will be rarer, though even this rule itself is not always consistent. Except for very short time spans we have no way of predicting what new population densities will be. Most importantly we cannot predict how small changes in an ecosystem, such as climate variations, will affect future populations.

What Global Warming will do to the world is therefore anybody's guess. It is the first shot in the pool game. All we can say with certainty is that every complex ecological system will fluctuate within the confines of its geological and geographical location and the nature and consistency of its local weather patterns. Within the system, individual population numbers, and even their very survival are inherently unpredictable. Chaos theory tells us that while we may well see a stable population in a variety of species for extended periods, this can suddenly change and produce inexplicable and unpredictable population changes. Populations go from borderline annihilation to plague proportions with seemingly tiny changes in the local environment.

Again, such wild fluctuations are usually interspersed with periods of apparently benign stability. On first glance, populations can thus appear stable. Occurrences of long periods of stability has led many to proclaim, and some to believe in the concept of a mystical "balance of nature" that regulates the world environment with some beautiful ordained "web of life" controlling all. When the sudden and inevitable large population shifts occur, the balance of nature adherents immediately presume someone is to blame. And that's always us, never the oil companies. They then presume firstly, that we are irresponsible, and secondly, that only they are responsible. Only they are sufficiently responsible to restore the mystical "balance of nature", they proclaim must exist.

Fly over any tropical jungle and there is really only one thing stable and consistent, and that's chlorophyll. Chlorophyll is endless. It's everywhere converting sunlight energy to plant growth. So with constant rain the hot humid jungle is always universally green. Within and beneath that endless green canopy it is not stability, it is

instability that reigns supreme.

Even in established temperate forests wild fluctuations not equilibrium, is the norm. The changes in the structure of an established forest is an exceedingly slow process. Just a few generations of tree reproduction might easily take a thousand years. It is probably inevitable that in the short life of an observing botanist, a forest would seem utterly stable and in perfect equilibrium. It's like the old story of a group of blind men feeling parts of an elephant and each in turn telling the world what an elephant is. The Balance of Nature hypothesis is nothing more than the claim that a snapshot in time is how the entire film should look.

For another clear and accurate overview, untainted by manipulative public relations and advertising, read *The Skeptical Environmentalist*, subtitled *Measuring the Real State of the World*. It was written by Bjorn Lomborg, who at the time of writing was an Associate Professor of Statistics at the department of Political Science, University of Asrhus, in Denmark. It's published by Cambridge University Press.

Lomborg is a statistician. He doesn't preach. He simply analyzes the known numbers and the published figures on species numbers around the world. He looks very critically at the mass of unsubstantiated utterances of the biodiversity "industry". He quotes their statements and clearly shows how incorrect the vast majority of their statements really are.

Lomborg uses a catalogued figure of 1,600,000 species for all the vertebrates, (animal, birds etc), mollusks (shellfish etc.), crustaceans, (prawns, crabs etc.), insects, and vascular plants (all the plants with "pipes" with flowing sap). The number of non-insects are actual counts. The number of insect species is an approximation. The known, properly documented and recorded extinctions of all these known species, since the year 1600, totals 1,033. That's a rate of 2.6 extinctions per year. There are probably more actual extinctions as the 1,033 count excludes guesses. However, most of the world's significant species are now known. In fact the discovery of a new species is newsworthy, so the 1,033 figure can't be wrong to any great degree.

Therefore, since the year 1600, less than three known species became extinct per year. That's a little less than 0.0002% per year. If these assumptions are badly out, if the rate is twice as much, it's still only 0.0004% a year.

Biodiversity issues are consistently and massively exaggerated and unrealistically and erroneously portrayed. The concept of a biodiversity crisis is used to hinder and prevent anything and everything that competes with fossil fuels and petrochemicals anywhere and any time, especially timber.

Let's look at what some of the foremost biodiversity axe-grinders have claimed.

The Sinking Ark by Norman Myers, published in 1979, told the world that we were losing species at the astonishing rate of 40,000 per year. *The Sinking Ark* sold well, and was believed by many.

The much-quoted environmentalist Professor Paul Ehrlich dreamed up his own figure of species loss in 1981. He nominated a loss of 250,000 species per year. That now appears to be an exaggeration of 249,997 species or an eighty thousand times overstatement. Ehrlich also informed us that half of all species would be gone by the year 2000. It hasn't happened, and at this time of writing his deadline was over four years ago. An almost zero loss is more like reality. He also warned us that all species would be gone from the planet by 2010, or at least within the following fifteen years.

In the late 1980s Harvard biologist E.O. Wilson told us that he estimated we are losing between 27,000 and 100,000 species per year. Where do these figures come from? This is where Wilson got his. The 27,000 per year is derived by saying rainforests contain "conservatively" 10,000,000 species, and as we are losing rainforests we are therefore losing species. The estimated "conservative" loss of species is nominated by him at 0.27% per year. Multiply 0.27% by 10,000,000 and that's where the figure of 27,000 species lost per year comes from. The guess of 0.27% is 1,600 times bigger than any known actual documented percentage. It's a fifteen-year-old political

"guesstimation" and it seems quite unrelated to reality. What is almost criminally irresponsible is that these fictions on diversity figures are taught as gospel in many environmental school and university courses. We allow our children to be taught these lies.

The ex-vice president of the United States, Al Gore, in his book *Earth In The Balance,* published by the Penguin Group in 1993 uncritically repeated the 40,000 per year figure from Norman Myers' 1979 book *The Sinking Ark*. Al Gore almost became president of the United States!

There has never ever been one shred of documented evidence to substantiate these wild claims of massive species extinctions. Surely it's reasonable to assume that if 27,000 species per year have really been lost every year for the last fifteen years there would be a substantial amount of obvious evidence. But there is none!

It seems that environmental crusaders simply dream up these fictitious numbers to create an issue. They then happily quote each other's numbers to support their own hallucinations.

What has been the result of these number manipulations? Achim Steiner, director general of the World Conservation Union, proudly tells us in an article in *New Scientist*, October 2003 that there are now over 100,000 "permanently protected" areas on the planet. Their total area is 18.8 million square kilometres. That's 12% of the all the land surface of the planet. It's also an area bigger than the combined areas of Canada, the US and Germany. But more significantly it's bigger than the total area of the world's croplands.

But Steiner still laments that it's not enough. His World Conservation Union "estimates that at least 11,000 known species are threatened with extinction, which is between 1,000 and 10,000 times the background or natural extinction rate". He also tells us that conservation organizations are pushing for more "managing" of all those massive areas of land. Undoubtedly, one might expect, that management would be by a huge army of bureaucratic experts, all tax funded to most specifically keep taxpayers out.

When *The Skeptical Environmentalist* first came out it was considered a brilliant analysis of environmental issues. However, in retrospect it was too brilliant and too lucid for some. The book was too factual and far too logical for what Lomborg calls the "biodiversity-environmental establishment". As soon as they realized it threatened their honey pot, they fought back.

Scientific American in its January 2002 issue says the book should be a welcome audit of environmental issues "yet it isn't". It goes on to say, "if its purpose was to describe the Real State of the World" then "the book is a failure." It relates how many scientists felt frustrated at Lomborg's "misrepresentation of their fields". Incredibly, *Scientific American* devoted eleven full pages to criticism of *The Skeptical Environmentalist*. The sheer volume and venom of the critics was itself astounding.

Three full pages are given to criticism by Stephen Schneider, a professor in the Department of Biological Sciences at Stanford University. Schneider is editor of *Climate Change* and the editor of the *Encyclopedia of Climate and Weather* and also the IPCC (International Panel on Climate Change) guidance paper on "uncertainties"! Schneider's specialty seems actually to be in doubting things.

Schneider wrote a testimony for the US Senate on *Climate Change: Causes, Impacts and Uncertainties*. His paper commences by asking, "Does Natural Variability Explain All Climate Change?" It does seem to say in places within the voluminous text that Global Warming, caused by anthropogenic rises in atmospheric carbon dioxide levels, is actually happening. A huge concession for him, I feel.

For two more pages in *Scientific American* there is criticism of Lomborg by John P. Holdren. Holdren is noted as the Teresa and John Heinz Professor of Environmental Policy at the John F. Kennedy School of Government, as well as Professor of Environmental Science and Public Policy in the Department of Earth and Planetary Sciences at Harvard University. Holdren reminds us (as justification for his opinions?) that he was involved with Paul Ehrlich in the production of

"our 1977 college textbook *Ecoscience*". We have already noted Paul Ehrlich's pronouncements on biodiversity arithmetic, so Holdren evidently concurs.

Holdren criticizes Lomborg's discussions on energy, complaining that the nineteen pages devoted to energy is insufficient. In Lomborg's defence it should be remembered that he is a statistician and getting sense out of the quagmire of misinformation on world energy reserves is extremely difficult. Holdren criticizes Lomborg's statements that the Earth is running out of usable fossil fuels. In this respect, Holdren is right and Lomborg is wrong. Altering the optical characteristics of the atmosphere is the problem. We can never run out of fossil fuels.

Holdren claims we are "running out of environment" which is a good each way bet. Holdren also likes to tell us that "oil is the most versatile and currently the most valuable of the conventional fossil fuels" and it is so nobly supplying "civilization's energy". The rest of Holdren's criticism is, as one might now suspect, along the same lines.

Lomborg also considers a wide variety of grossly inaccurate environmental claims other than biodiversity. He discusses Global Warming and asks if this too is being exaggerated. If it is, he argues, should we not just get on with life and use some of our extra wealth to pay for any extra Global Warming costs? I maintain that the seriousness and the dangers of Global Warming are not exaggerated at all, but are in fact deliberately and strenuously minimized. The minimized published effects and numbers are the ones Lomborg relies on in his book to justify, on a cost basis, the continued use of fossil fuels.

Lomborg also looks at the much-publicized "human population explosion" issue. He suggests that population is not the problem and argues the real problem is poverty and lack of productivity. (Add in entrenched and incompetent and corrupt bureaucrats and I would totally agree.) Lomborg points out that the most densely populated regions of South-East Asia have the same population density as the United Kingdom. He also notes; "The Netherlands, Belgium and Japan are far more densely populated than India, and Ohio and Denmark are more densely populated than Indonesia". He also notes that world food production is climbing more rapidly than is world population. These facts are also in complete contrast to what the environmental industry and fund collection organizations keep claiming and promoting on TV.

John Bongaarts is noted as vice president of the Policy Research Division of the Population Council in New York City, and he gets two pages to counter Lomborg. Bongaarts criticizes Lomborg's statements that food production per head has risen without acknowledging that some government inspired "green revolution" was a major factor. Bongaarts argues for more government-controlled assistance. (Surely the underdeveloped world needs less bureaucratic interference, not more.) Bongaarts in fact states that cheap food in Western countries is only possible with agricultural subsidies. That too ignores reality.

It certainly ignores Australia, an affluent Western nation that produces and markets extremely cheap food with zero subsidies. Food prices are low because now, with mechanization, one man can grow enough food to easily feed fifty people. Nevertheless, Bongaarts is allowed over two full pages in *Scientific American* to develop these flawed arguments.

Thomas Lovejoy also gets two full pages to criticize *The Skeptical Environmentalist*. Lovejoy is described as a chief biodiversity advisor to the World Bank. From 1973 to 1987 Lovejoy directed the World Wildlife Fund-US (WWF). His criticism is predictable, and especially so when one reads Lomborg's assessment of the World Wildlife Fund (now the World Wide Fund for Nature).

It must be noted that the World Wildlife Fund seems decidedly pro-oil. For example; the construction of a massive 1,050 km long oil pipeline through the rainforests of Cameroon in West Africa was supported by the WWF. The WWF refused to join environmental groups who were in strong opposition. British biologists claimed the huge pipeline "could wreck the coastal ecology of

Cameroon and put thousands of fishermen out of work". The oil pipeline received US$220,000,000 in funding loans from the World Bank. An odd background for a biodiversity crusader, surely?

The WWF also seem very pro-plastic or at least anti-wood. In Europe they have been insisting that when trees fall over in a forest, for what ever reason, the trees should be left there to rot. They say it is to preserve the biodiversity of the termites or what ever it is that eats rotting wood. They believe the wood should not be collected. The WWF also seems a little careless with there own statistics. The WWF conducted a population survey of the pygmy chimpanzee or bonobo in the Democratic Republic of the Congo. Their conclusion, as reported in *New Scientist* 5 February 2005 was that there were so few of the chimps there any more that "it was impossible to work out how many were left". In contrast Jef Dupain of the African Wildlife Foundation reported that from their own observations of the chimps nests and actual sightings of the animals themselves that there were approximately two beasts per square kilometre. Their area counts show population densities at pre 2002 levels.

The witch-hunt for Lomborg did not stop there. Others joined the hunt.

Peter H. Raven gets five pages in the August 2002 issue of *Science*, a lot of which is devoted to criticizing *The Skeptical Environmentalist*. Raven waxes poetic about "false prophets and charlatans" and includes Lomborg as one of them. Raven himself is described as the director of the Missouri Botanical Gardens. He sites Lester R. Brown's book *Eco-Economy* as a source for much of his information (read misinformation).

Eco-Economy could well have been written by the oil marketing public relations gurus. It certainly follows their marketing strategies. It's all standard stuff. It says – the people of Copenhagen use a lot of bicycles (for short trips). Nuclear fuel has public safety issues (implying danger) but nuclear energy is also too expensive (not true – See Chapter 10: **THE SABOTAGING OF NUCLEAR ENERGY**). He naïvely tells us that things are "driving the global transition to solar/hydrogen age" (simply ridiculous, see **FUEL CELLS AND THE HYDROGEN ECONOMY CONCEPT** in Chapter 11).

Lester R. Brown sees natural gas as the clean fuel for the planet's immediate future (therefore ignoring Global Warming). Brown spiels the standard pat phrases of the environmental industries, "deforestation increases flooding, accelerates soil erosion, inhibits aquifer recharge, and decimates plant and animal life". Brown also claims forests are preferred as they add organic matter to soil. (Utterly and totally wrong – grasses do, forests don't.)

As noted in Strategy 34, Lester R. Brown was instrumental in the formation of the World Watch Institute of Washington DC, and of course their policies and pronouncements are in line with those in his book *Eco-Economy.*

Science magazine kept up the criticism of Lomborg. It reported in its 17 January 2003 issue that a Danish scientific dishonesty panel decided that Lomborg's book is "scientifically dishonest". (Fortunately the Danish Research Agency, the DRA, decided to investigate the dishonesty of the dishonesty panel itself and to determine if it was being influenced.) Subsequently the Danish Prime Minister, Anders Fogh Rasmussen told Danish TV audiences that he "has full confidence" in Bjorn Lomborg. The Danish Prime Minister in fact publicly exonerated Lomborg.

Fred Pearce's *Comment and Analysis* editorial in the 18 January 2003 edition of *New Scientist* showed that decency and scientific fairness was not totally forgotten. Pearce heads the article "Call Off The Witch Hunt". He asks in the article, is Lomborg a "misguided maverick, or a victim of green McCarthyism?". Pearce comments "Lomborg got it in the neck for being unkind enough to declare the truth. For instant, his questioning the claim that the planet loses 40,000 species every year was criticized, not for being unjustified but for failing to acknowledge that Myers (Author of *The Sinking Ark*) deserves credit for being the first to point out that the number was large". *New Scientist* goes on to quite correctly ask, "Who is upholding good scientific practice

here, exactly?"

Then in January 2004, a year after Pearce's call for scientific justice, *Science* reported that the Danish Research Agency repudiated the Danish interrogatory panels finding. Lomborg was finally found to be not dishonest. However the tiny half page report, (remember eleven pages of criticism) clearing Lomborg's name still had a sting. It was headed, "Charges Don't Stick to *The Skeptical Environmentalist*". Did that mean to imply Lomborg was slippery? Ask an advertising copywriter.

The fossil fuel industries must have seen *The Skeptical Environmentalist* by Bjorn Lomborg as a book worthy of their attention the moment it was first reported. Just about every environmental report and environmental impact study being demanded today somehow always manages to target competitors that threaten the fossil carbon industries. That must take some clever arranging.

You never see glaring headlines and full page stories of world "biodiversity" being threatened by increased carbon dioxide levels in the atmosphere, or by Global Warming, or by massive world climatic changes. Of course not, those phenomena are all caused by the coal and oil producers and the petrochemical industries. These industries are not going to allow their own arguments to backfire.

There are other things that eliminate the species en masse. In Earth's past massive and virtually instant loss of biodiversity mostly happened when extraterrestrial objects rocked our planetary boat.

Along with the planets, comets also orbit the sun. Comet orbits are giant ellipses with one end near the sun and the other extending sometimes far off into deep space, sometimes millions of miles beyond our solar system.

As comets pass rapidly round the sun they often put on spectacular displays. We often get showers of "shooting stars", as cometary debris graze our atmosphere and burn up. The display periods only ever last a few weeks as comets soon head off again on their long elliptical round trips. Halley's Comet is perhaps the most well known; it returns to us approximately every 76 years. Halley's Comet is estimated to be over eight miles across. Fortunately close calls with comets are relatively rare.

Asteroids are more dangerous. Between the orbits of Mars and Jupiter there are millions of bits of cold lifeless rock, orbiting in a roughly circular path around the sun. They just never ever bunched together, or accreted, to form themselves into another planet. The collection is called the Asteroid Belt. The giant gravitational field of nearby Jupiter kept disrupting the accretion process and a planet was never able to coalesce from all the pieces. Those same gravitational forces will sometimes dislodge an asteroid out of its regular orbit and send it drifting off unpredictably – chaos theory in action again!.

In the Asteroid Belt there are about one million individual asteroids bigger than a kilometre across. There are about 1,000 bigger than 30 kilometres across, 200 of which exceed 100 kilometres. The three biggest asteroids are Ceres, with a diameter of 933 kilometres (579 miles), Pallas at 523 km (325 miles) and Vesta at 501 km (311 miles).

There are also an uncountable number of small items floating about in our solar system. They range from specks of dust, grains of sand, small rocks, large boulders and on up. These objects are constantly bombarding the planets. The craters of the Moon are not volcanoes, but impact craters. Earth has had more impacts in its history but weathering has eroded away most of the evidence.

When a small object hits the Earth's atmosphere, we call it a meteor. We might see it burning up in the night sky as a "shooting star". Objects smaller than about thirty feet (10 m) across burn up in the outer atmosphere and rarely make it to the ground. When a small piece does get through to the Earth's surface it's called a meteorite.

The frequency of collisions between the Earth and these space rocks has been quite well studied and like many natural systems it follows a simple scaling law – collisions with small objects occur frequently, collisions with larger objects are rarer. The events occur statistically. The frequency for small particles is quite well determined from measurements on the density of dust particles

made with instruments in spacecraft. Mid-sized impacts are studied from the ground by observing meteor trails in the night sky. Large impacts leave their mark in the geological record.

The assessed results show that on average a particle the size of a grain of sand hits our planet every 30 seconds. Boulders three feet, or about one metre across, hit us about once a year. Seriously big rocks, say 300 feet (100 m) in diameter and big enough to penetrate through the atmosphere and leave sizeable craters, strike about once every 10,000 years. Catastrophic events involving objects around 10 km in diameter occur statistically about every hundred million years.

When an object hits the Earth, it's travelling at an incredible speed. A large asteroid may strike with a speed approaching 20 miles per second (30 kilometres per second). That's one hundred times faster than a supersonic rifle bullet. On impact an enormous amount of energy is released. At these speeds every ton of rock will release more energy than one hundred tons of TNT. An asteroid ten kilometres in diameter (six miles) could weigh in at over a thousand billion tons. It would explode like ten billion Hiroshima bombs. Life certainly could not evolve and survive on any of the Solar system planets back in the time when these collisions were more frequent.

There is a theory that the planet Jupiter with its enormous gravitational pull has sucked in millions of these rocks and effectively vacuum cleaned all the rogue debris from the inner solar system. This theory says that without this cleaning process life would never have had a long enough innings to evolve creatures as complex as us.

In July 1994, comet Shoemaker-Levy 9 was sucked in by Jupiter and provided direct evidence of these collisions and their spectacular energy releases. The comet was named in part after one of its discoverers, Eugene Shoemaker. Shoemaker, incidentally, was the first to seriously propose that the large craters on the Moon, along with many here on Earth, were formed by impacts, and not volcanoes as previously believed.

In the last 600 million years, there have been about twenty-eight major world extinctions. These have been so vast and so widespread that they have become the yardstick for geological time scales. They form the boundaries between geological periods. Each geological period has its own unique collection of flora and fauna, which evolved during the period and was, in turn almost totally wiped out at the end of the period.

Geological periods are not determined from geological events. They are determined by biological events. The relative age of rock formations all across the world is assessed by simply observing the fossil remains embedded in the nearest sediments. The Mesozoic Era was the age of the dinosaurs; it included the Cretaceous, Jurassic and Triassic periods. The Mesozoic Era ended at the Paleocene boundary some 65 million years ago when the dinosaurs all but disappeared from the fossil record. That boundary was the start of the era of mammals – the Cenozoic Era.

It is now generally accepted that at least one giant meteorite hit the Yucatan Peninsula in Mexico 65 million years ago and that impact ended the reign of the dinosaurs. The Yucatan hit was possibly accompanied by a few minor ones spread over the Caribbean and Northern Pacific. The Yucatan meteorite probably weighed in at more than a trillion tons. That huge rock, travelling at the enormous velocities characteristic of meteors, created an impact with explosive energy that has been estimated at 10,000 times the world's total nuclear arsenal, and all going off at once. See **SPLAT** in Chapter 1.

At the height of the Cold War, the term "Nuclear Winter" was coined to describe the potential effect of exploding thousands of nuclear weapons on the Earth's surface. A nuclear winter however, would pale to insignificance compared to the winter following a Yucatan size impact.

There were probably a few million significant species inhabiting planet Earth on the day of that impact. A reasonable guess is that at least three-quarters of all of them became extinct in the subsequent years of perpetual winter.

Mass extinctions leave giant ecological vacancies and niches. The extinctions at the end of this Mesozoic Era left gaps that were rapidly filled

by an explosion of species that all derived from some, generally, tiny insignificant creatures that survived the terror. The creatures were a primitive type of mammal, although some, it now seems, were big enough to hunt small dinosaurs.

The mass extinctions at the end of the Mesozoic era could (to coin a phrase) surely be described as a "severe crisis in biodiversity". Of course that particular wipeout did give mammals their chance. And that new evolutionary track led finally to us.

It is not the impact that wipes most life off the planet. It is the cancerous climate change caused by the debris moving around the world from the impact site. The materials alter the sensitive and vulnerable optical characteristics of the atmosphere. Indications suggest that some of these resulting climate changes would linger for a million years or more. Mostly the impacted species were never able to re-establish themselves.

Impacts answer a lot of questions on major extinctions, but things are not always that simple. The biggest ever extinction, some 250 million years ago, marked the end of the Paleozoic Era (The Age of The Invertebrates) and initiated the start of the Reign Of The Dinosaurs. That particular extinction appears to have been triggered by massive volcanic activity in Siberia, occurring over a considerable period.

However, others still argue that even this event was impact related. A small group argue that all impact related extinctions depended on the impact initiating long-term seismic activity. An even smaller group argues that the impact evidence shows explosive seismic events and is not extraterrestrially related at all.

The jury may be still out on the causes of those old climate changes but all agree: massive species extinction and biodiversity loss is caused by the accompanying climate change and nothing else. It is certainly not caused by building hydroelectric dams, which actually minimize climate change. And is certainly not caused by building holiday resorts on tropical coastlines; as is argued by a vociferous few here in Queensland, Australia.

Patrick Brenchley and his associates at the University of Liverpool in the United Kingdom studied the cold Hirnantian Glaciation that occurred around 439 million years ago. Their research showed three separate and dramatic waves of species extinction. All the extinctions occurred in the very short period between 439.5 million years ago and 439 million years ago. That's a period of just half a million years. They too concluded from their studies that the only significant phenomenon that caused large-scale species extinction at any time through our Earth's long history has been rapid climatic change.

Let me state unequivocally: except for either a massive nuclear war or an impact from a very large asteroid, the only real threat to life on this planet and the diversity of life on this planet is the rapid global climate change being caused by our continued extraction and use of fossil carbon materials. By comparison all other factors combined approach almost total insignificance.

Despite this, it is becoming glaringly apparent that the whole issue of Global Warming and rapid climate destabilization has been reduced to lip service by the vast majority of biodiversity advocates. Carefully directed, and narrowly focused enthusiasm is now dominating world environmental debates.

The much publicized, highly promoted threat to world biodiversity needs examination. Are they making mountains out of molehills to suit their massive PR exercise? What really is the reality?

Even today the number and variety of all species currently living on the planet is still at best a collection of uncoordinated guesstimations. There is simply no definitive central register of species types. So we don't accurately know how many have already been discovered and named. Estimates for totals range from just under two million to way over thirty million.

If we include all species the numbers zoom. There are probably at least two million species of fungi. In a fungi study in South America, on just two different types of trees, 350 different fungi species were found. And bacteria: a few years ago Vidgis Torsvik, a Norwegian researcher, conducted a test on a single gram of soil and estimated it contained some 10,000 bacterial types.

In the grand total of all species types, a few billion unique species seems not a particularly high estimate for all life currently on Earth. That's possibly a single species for every man, woman and child on the planet.

Some self-proclaimed biodiversity saviours are proclaiming we should include bacteria on lists of possibly threatened species. When just one insect can have a hundred different bacteria living on it and in it. This is foolish. Totally new species of bacteria can evolve in weeks, possibly even days. That's why antibiotics lose their effectiveness so rapidly.

When considering the long history of life on Earth, estimates for the total number of species that have ever existed, obviously vary widely. Estimates for just the number of plants and animals range from five billion to fifty billion.

A general consensus among biologists suggests that 99.9% of all species that ever existed through Earth's long history are now extinct. Obviously humans can't be blamed for those 99.9% of losses. If life on Earth was shortened down to one day, then we humans have been around for a few seconds.

But some we can be blamed for and sometimes it just can't be helped. In the coastal waters of Tasmania for example, there is a small fish that moves by crawling along the sea floor. It's called a "spotted handfish" (*Brachionichthys hirsutuscraws*). They grow to around one hand width long.

Unfortunately for the spotted handfish, the Northern Pacific starfish (*Asterias amurensis*) turned up in the southern Tasmanian waters sometime in the 1980s. It probably arrived in seawater being used as ships ballast. In a bizarre twist of fate the Northern Pacific starfish developed a taste for, and started devouring the eggs of the Southern Ocean spotted handfish.

Thus the spotted handfish may become the first ever known and recorded loss of an individual marine species, ever. The loss is not yet absolutely confirmed so the spotted handfish has not yet increased the 1,033 documented species known to be lost in the last five hundred years to 1,034.

Of course the biodiversity industry demand funding for the construction of breeding tanks to breed the handfish and funding to employ research personnel to find some fish to put in the tanks. And more funding to study and monitor "all aspects" of the fish's life cycle. Total funding, to be derived from Australian taxation, is expected to be well over US$1,000,000. Biodiversity is certainly the ultimate money sponge.

Many of the species living on the planet only continue to exist by accident. They just happen to live in some form of protective isolation well away from the harsh centres of competitive evolution. Marsupials in Australia are typical. Immigration of the more successful mammals, specifically the big cats species, never occurred. However feral house cats are rapidly evolving into bigger animals, so it's only a matter of time.

Apart from Global Warming, modern day humans simply don't wipe out species wholesale and never have wiped out species wholesale. We have wiped out a few species on almost every continent, but wholesale wipeouts, never. For wholesale wipeouts we must go back a few thousand years to our early ancestors. Those supposedly noble savages that, we are constantly told, lived in blissful and beautiful harmony with nature.

Humans started moving around the world about fifty thousand years ago and where ever they went they systematically killed off all the big game, all the megafauna they could find. It only stopped a few hundred years ago. Those noble savages killed off 97% of all the large mammals and marsupials living on the planet fifty thousand years ago, in one long continuous blood bath.

In the last few hundred years things have changed and humans have become civilized. Today, for man to eliminate just 10% of the major and significant species on the planet at even five times the rate we have been for the last 400 years, it would take us 100,000 years, not 97% in 50,000 years. It would probably take longer because currently we like to preserve species. The bloodbath practices of our flint stone ancestors are now totally out of fashion.

Statistically, in that same 100,000-year period there is an estimated 10% chance of being hit by at least one extraterrestrial object with a diameter of one kilometre, say half a mile. It will be either part of a stray comet, or an asteroid dislodged from its stable orbit in the Asteroid Belt. When it hits it will have an explosive energy equivalent of more than a million Hiroshima bombs all going off at once. Such an impact would wipe out 10% of all species.

In a million years we stand a 1% chance of being hit by a 10 km object. That's an impact big enough to wipe out 80% of all species. In one hundred million years, the odds are, such an impact is a certainty.

The extinction and creation of new species is a constant and rapid process in the evolution of life on earth. Wherever and whenever a small unique environment is formed, new species immediately begin to evolve to best suit that tiny unique environment. A new niche in some local environment can occur, and a new species can evolve and develop, and it now seems in an amazingly short period of time.

Individual species are like individual animals; they are born, they live for a period, they give birth to other species, and they die. Some live for a long time, some die young. Some live for as little as a few hundred years, others live for million of years.

In the United Kingdom, several species of moths became darker in color during the 19th century. The best-studied example is the peppered moth, *Biston betularia*, which gets its name from scattered dark markings on its otherwise white wings and body. The moth is active at night and rests by day on tree trunks. In areas far from coalmines and other industrial activity, the trunks of trees are covered with lichen. The mottled white moths were well camouflaged among the mottled white lichen.

In some areas, a severe combination of air pollution and coal soot killed the lichens and blackened the tree trunks. Against such a background, a predominately white moth stood out. The white moths were easy prey for insect-eating birds. A darker coloured moth would have a much better chance.

In 1849, a completely black variety, a totally new species, or at least a subspecies of *Biston betularia*, was discovered near Manchester. Then within the next eighty to ninety years this black form had increased to 90% of the population in the region. The variety has been given the very appropriate name *Biston betularia carbonaria.*

An English geneticist, Kettlewell, released moths of both types and observed that birds, understandably, ate a much higher fraction of the light moths than the dark moths. That new, all black species of moth evolved in the short period from the mid 1700s, before the widespread use of coal, to 1849. Given the right circumstances it is thus obvious that a new species can evolve in a period as short as a hundred years..

Since pollution abatement programs were put in place after World War II, the light form has been making a comeback in the Liverpool and Manchester areas. What would the disciples of biodiversity suggest we do about the black winged moth? Should we protect it? It is, after all most definitely a unique species. Do they suggest that areas of England should be set aside permanently for coal mining and coal dumps so that this new species, this black moth, has a permanent place to suit its camouflage? Some argue it didn't happen like that at all and no new species evolved No matter what, the biodiversity industries are sure to demand huge grants to further the study of the threatened black *Biston betularia carbonaria.*

Another example is found in a giant crack, or series of cracks in the African continent. The cracks run roughly north south up through the eastern side of Africa. It's called the Great Rift Valley. Over the next several million years Africa will slowly split apart at these crack lines and East Africa will become an island. The cracks are often full of water and thus form a line of huge lakes. Lake Victoria for instance, is in a sort of associated sub-crack. Near the end of the last ice age, the lake was completely empty. There was a climate change, it filled with fresh water and so became a lake two hundred miles wide.

A little fish called a cichlid somehow got into these lakes in the Great Rift Valley. The main ones being Lake Malawi, Lake Tanganyika and Lake Victoria. The cichlid fish in some ways seems to be a fish version of the placental mammal, in that they too have an efficient and adaptable design. Cichlid fish also have an unusual internal mouth form that can adapt, or evolve rapidly so as to be able to munch on whatever food is available. Within the relatively short period of 12,500 years, those original fish evolved into 500 totally distinct and unique species. Some became mouth brooders, where the young swim into the safety of the mother's mouth when danger threatens. There are species of cichlid whose jaws can crush snail shells, and they live on snails. Some evolved to live on zooplankton. Others are insectivores. Some live on prawns. There are big fish and little fish. About a third of all the bigger species of cichlids live on smaller species of cichlids. Some eat the scales of other fish. Cichlids also come in an incredible range of shapes and sizes and colours.

Over the 12,500-year period, the average rate of evolution to produce that many totally different and independent species is therefore one new species every twenty-five years. And that all happened in mainly just one lake. Whether they like it on not, the simple reality is that biodiversity is in fact, totally impossible to prevent.

The fossil carbon industries use hypothetical biodiversity loss scenarios with consummate skill. Whenever a hydroelectric project is proposed on any river, there now has to be a long drawn out "impact study". In such studies, Global Warming considerations are only ever conspicuous by their utter and complete absence.

Very carefully and deliberately, environmental impact studies always discover "unique" species. The studies are made sufficiently open-ended to ensure that some unique something will always be found. No matter where you are, or where you go on this planet of ours, nothing is absolutely the same and if something is not the same as everything else, then by definition it's "unique"!

Constructing a dam creates a lake with its own unique environment, which will, given time, just as assuredly create its own unique range of species. Just like the cichlid fish, new life will take up residency, adapt, develop, and evolve.

A lake is a nice place to live, and a new lake is just waiting for new settlers. The new settlers can evolve into new species, which breed rapidly until they are limited by food supply. Eventually predators evolve, or move in on this new abundant source of life, and they too change. Eventually a new ecological system becomes established.

Some well-organized groups of proclaimed environmentalists argue that our dams should be drained in an endeavour to restore "the old ecological balance". This argument, you might note, never seems to occur with new dams that aren't used for power generation. Naturally formed lakes used for power generation, these environmentalists must find very frustrating.

From a biological point of view, small lake ecologies are like the ecologies of small islands. Islands are patches of land isolated in an ocean of water. Lakes are patches of water isolated in an ocean of land.

A book, *Island Biography,* by the previously mentioned E.O. Wilson of Harvard University and Robert MacArthur of Princeton University, shows how species extinction and ecological changes are incredibly common in small island ecologies. Research done on the mangrove islands in Florida clearly indicates that extinction and creation of highly localized species are actually completely normal and natural events.

Of course, it is now possible with genetic engineering to actually create new species. In the near future we will be able to create almost any life form we wish to dream up. It will be done in the laboratory and at any time we like. Genetic engineering (GE) can now produce pest resistant crops. Crops that have no use whatever for pesticides. Being cynical one might wonder, is this the real reason why genetic engineering is currently receiving such a high volume of bad press?

Other companies engineer plants to be resistant to high applications of specific herbicide or pesticide chemicals. They then take out patents

on the seed. The companies sell to farmers the resistant seeds, and to that same farmer, they can sell huge quantities of the chemicals the plants have been engineered to tolerate. This type of genetic engineering most certainly does deserve bad press.

Apart from genetic engineering creating new species, it is gratifying to know that older plant species are being preserved. Private, independent organizations are becoming established that collect rare and endangered seed stock to ensure worthwhile diversity is not lost. They grow and harvest the threatened species and then distribute the seed to responsible growers throughout the world. It's working extremely well. The concept, it seems, does not present a threat to the agrochemical industry so the "rent-a-crowd greenies" aren't in the least bit interested.

It is of course wise to establish large national parks. It is wise to preserve examples of strange ecological systems and the unusual flora and fauna they contain. But to enclose nation-sized chunks of land to protect biodiversity is self-defeating for it necessitates massively increased use of fossil carbon-based materials elsewhere. Such philosophical concepts are idiotic when Global Warming is altering ecosystems wholesale, but this is blindly ignored.

Remember how the Australian state of Tasmania, with an area about the same size as South Korea, has already had more than 50% of its total area locked up as delineated wilderness. The areas lost to humanity contain extremely practical hydroelectric sites. Good hydroelectric sites are incredibly rare in the almost universally flat and featureless landscape of mainland Australia.

In the early 1980s, a proposed hydroelectric scheme in southwest Tasmania was abandoned because of environmental protests. Instead the proposal put forward was to lay an undersea cable across Bass Straight to the mainland to access the mainland electricity grid. In other words, Tasmania was looking not to export green energy to the mainland but to import electricity, generated by the burning of brown coal, onto the island.

If the power cable had been built, quite possibly Tasmania might have been able, at some future date, to export hydroelectricity, across the straits and back into the mainland grid. What was the outcome? The electricity line didn't go ahead. Instead a gas line was laid across the 200 km wide Bass Strait. That pipe ensures two things: the state has ample supplies of fossil fuel and Tasmanian hydroelectricity will never reach the mainland.

In stunning contrast, oil drilling has recently located small but commercial oil deposits in the state. That oil will be mined. The Australian and the Tasmanian green movements have been loud in their silence on these issues.

The initiatives that effectively turned Tasmania into a fossil fuel dependent state was the first "success story" of what became the Tasmanian Green Party. The Green Party stopped hydroelectric power generation in Tasmania and "hooked" the state on fossil fuels. The people who so successfully stopped their state's hydroelectric power was the Tasmanian Wilderness Society, from which the Green Party sprang.

This action to prevent the expansion of hydroelectric power and to consequently further destabilize world weather systems seem to be of no consequence to any self-proclaimed green movement anywhere. In 1984 the Tasmanian Wilderness Society became simply The Wilderness Society and seems to have continued an ecological crusade to, in effect, market fossil fuels in other Australian states.

In 2003 the Australian Green Party was the only political party – left or right of centre – to protest against an expanded use of ethanol as an automotive fuel. Their argument was that sugar cane farming in tropical Queensland would need to expand. This was somehow inferred to be ecologically unsatisfactory. Their next obvious ploy to stop ethanol is to argue some hypothetical damage to the Great Barrier Reef. It will probably be a generalized argument and will, I'm sure, avoid references to the agrochemicals that actually do the damage.

This game plan seems to be a general characteristics of all green politics. In the 1960s, at the height of Soviet power it was described as

the "red-green" political movement.

In 1995, a book was published in New York by The Free Press. Shortly afterward it was published in London by Weidenfeld and Nicolson. I had read a review in *New Scientist* in their October 1995 issue. I just had to get a copy. The book is called *Nature's Keepers;* subtitled *The New Science Of Nature Management.* It was written by Stephen Budiansky.

Quotations from *Nature's Keepers* are used with the much-appreciated permission of the author. (Copyright Stephen Budiansky 1995.)

Stephen Budiansky could be described as a mathematical environmentalist and a science writer. He holds a Harvard University degree in applied mathematics. Budiansky was, for a period, the Washington editor of the prestigious science journal *Nature* and a senior writer for *U.S. News And World Report*. He is the author of *Covenant Of The Wild* Subtitled *Why Animals Chose Domestication*. The book was a runner-up for the 1995 Rhone-Poulene prize for science books.

Nature's Keepers is a book that will always receive criticism from the biodiversity-environmental industry, for in it Budiansky points out much of the innate stupidity of the pseudo-religious side of the environmental movement. It is a brilliant work where so much of the cancer of environmental bigotry and incredible naïvety is exposed and removed with surgical precision.

Budiansky considers the reality, or otherwise, of the existence of anything anywhere that could genuinely be called a wilderness area. Budiansky states that (apart from Antarctica) there is not a continent on the planet that has not been totally modified by the hands of man for at least ten thousand years. He points out that on any continent where the vegetation could burn, it was burnt; it was regularly and systematically torched for man's convenience.

Budiansky argues, and I think we have to accept his argument, that the first tool used in farming and land management was not the plough, nor the rake, nor the hoe, but fire. With the exception of Antarctica, man has been massively modifying his environment with fire on every continent on Earth, at least since the end of the last ice age. I doubt academic theories on ecological management ever crossed the mind of early man, not even for one second.

In Australia, for instance, there is substantial evidence that the predominant tree species, before the arrival of man were conifers, and not the eucalyptus that now almost totally predominate. In Australia, man arrived with his control of fire some fifty thousand years ago and vegetation (and almost certainly weather) in consequence was radically changed.

The unhampered, untouched wilderness that unthinking environmentalists imagine as their objective, has never ever actually existed. Nobody knows what it was like before the last ice age and before the time man started to burn landscapes for convenience. In Australia, the human-free environment ended 50,000 years ago. That's exactly in the middle of the last ice age. (Although in Australia it never got particularly cold.) That was the last time "untouched wilderness" existed in my country. One can't help asking, which "particular wilderness" do wilderness societies consider as the "true wilderness"? And who defines it?

Budiansky establishes beyond any doubt that this planet's surface has been so modified by man with his control of fire that it had become a changed and tamed world well before the advent of recorded history.

He points out that the hunter-gatherers of Sub-Saharan Africa have been using fire for at least the last sixty thousand years. He reports on controlled experiments in Malawi and Zimbabwe, where it has been clearly established that regular burning has become essential for the well being of such grazing animals as zebra and antelope. Living in a man-made, man-modified environment suits them. That is the only "wilderness" the wild animals know.

He points out that ancient man used fire for his own benefit in his migration across the length and breadth of the planet. In doing so his constant burning "manufactured" grasslands and in consequence made hunting easier.

Budiansky ridicules the popularized myth that North America, prior to the arrival of Western man, was covered with "primeval forests" "dark and untamed", where a squirrel might, in the days before the white man arrived, "have travelled from Maine to Louisiana never once setting foot on the ground". The pseudo environmental movement love to portray the high canopy as being extremely dense.

It seems to me that reality is quite different. It seems that the distant and absent portrayers, with wild poetic license, are the entities that are extremely dense.

Budiansky insists that to find the reality, we need to listen to the explorers that actually trod the land in those times. And so, in *Nature's Keepers* he quotes, "A stagecoach, said one (explorer), might be driven from the east coast to St. Louis without clearing a road." That alone obviously makes the squirrel story a nonsense.

Budiansky tells us of Peter Kalm, a Swedish botanist sent by Linnaeus (who we have already met) to collect specimens of New World plants made a similar observation. He described the forests of New Jersey in 1750 as so free from underbrush that one could drive a horse and carriage straight through them. Captain John Smith of the Jamestown, Virginia, settlement concurred, saying, "A man may gallop a horse amongst these woods any waie, but where creekes or Rivers shall hinder,". (It should be remembered by us other English speaking people that early Americans spoke Shakespearean English.)

Budiansky informs us that if there is one point on which the early European travellers and settlers who set down their observations of the New World agreed, it was that the forests of eastern North America reminded them of nothing so much as the carefully tended parks of the great estates of their homelands. An explorer in 1607 observed the trees around present-day Portland, Maine, "growing a great space asunder one from the other as our parks in England and no thicket growing under them." In the early days of the Plymouth colony, the Pilgrims found the woods "thin of Timber in many places, like our Parkes in England." In New Jersey in the mid-seventeenth century, the woods were described as "but thin in most places, and very little underwood". Another explorer noted an abundance of high grass and trees that "stand far apart, as if they were planted." And, "In such open, parklike wood, deer and turkey could be seen a mile away, cattle three miles."

Others told of vast, open grasslands with hardly a tree in sight. Passing through western Virginia in 1722, William Byrd noted, "There is scarce a shrub in view to intercept your prospect, but grass as high as a man on horseback." A seventeenth century settler of Salem, Massachusetts, told of a place nearby where "one could stand upon a little hill and see divers thousands of acres of ground as good as need be, and not a tree in the same."

The writer Parkman romantically portrayed the sixteenth century Italian navigator Verrazano laying off the coast of New England, espying one of his mighty literary forests as full of "shadows and gloom." Yet Verrazano himself told of marching inland fifteen miles from Narragansett Bay, (in what would become Rhode Island), finding "open plains twenty-five or thirty leagues in extent, entirely free from trees or other hindrances." Where the explorer did encounter forests, they grew so open and unencumbered by underbrush that they "might all be traversed by an army ever so numerous,".

The Europeans were uniformly impressed, if not surprised, by these open woods and meadows, but they did not have to search far for an explanation.

Budiansky relates the explanation, given in 1632, by Thomas Morton, an English fur trader and adventurer who travelled extensively through the backwoods of Massachusetts. (Sometimes it seems his wanderings were only just a little ahead of the law). Morton was however a keen observer, writing:

> *"The Savages are accustomed to set fire of the country in all places where they come; and to burn it, twize a yeare, vixe, at the Spring, and at the fall of the leafe. The reason that moves them to do so, is because it would be otherwise so overgrown with underweedes that*

it would be all a copice wood, and the people could not be able in any wise to passe through the country out of a beaten path. The burning of the grasse destroyes the underwoods, and so scorcheth the elder trees, that it shrinks them, and hinders their growth very much: So that hee that will look to finde large trees, and good tymber, must not depend upon the help of a woodden prospect to find them on the upland ground; but must seeke for them in the lower grounds where the grounds are wett when the country is fired. For when the fire is once kindled, it dilates and spreads itself as with the wined; burning continually night and day, until a shower of raine falls to quench it. And this custome of firing the country is the means to make it passable, and by that meanes the trees growe here and there as in our parks: and makes the country very beautifull, and commodious."

Budiansky also goes on to remind us that;

"The extent to which the landscape of America, prior to 1492 was the artificial creation of its native residents, is almost impossible for us to grasp, so encumbered are we with the nineteenth-century myth of the forest primeval and the more recent myth of the Indian as an ecological hero who trod softly through the forest on moccasined feet without snapping a twig."

But at a minimum the Indian was the dominant source of fire, and *"fire is the dominant fact of forest history"* in North America.

The idea has not been easy for historians, ecologists, or even anthropologists to accept. Despite the overwhelming documentary evidence of Indian fire practices, the suggestion that Indian-set fires had any significant part to play in shaping the North American landscape was almost scornfully rejected by early twentieth-century foresters. Climatic determinists of the Clements School were especially resistant to the notion that fire (and thus man) rather than climate (and thus God and nature) was the force that shaped the grasslands.

It should be noted that when burning stopped, mesquite, juniper, sagebrush, and scrub oak began over-running the grasslands of the US Midwest and Southwest. By 1960 they covered some seventy-five million acres in Texas and surrounding states. The grasslands were no longer grasslands.

When modern ecologists and range managers saw a tangle of mesquite, sagebrush and juniper jungles invading drier grasslands from the west, they immediately blamed it on overgrazing by domestic livestock that, they proclaimed, had weakened the native grasses. Yet even in areas fenced off from stock, the tangled shrubs appeared and rapidly took over. It gradually became clear that, to a substantial extent, the native North American grasslands had climate and soil perfectly suitable for deciduous forests to grow. But fire created grasslands and then kept them as grasslands.

Nature's Keepers consistently recognizes and reminds us of these considerations.

Regarding fire, Budiansky notes that,*"The same pattern was repeated not just across America but throughout the world."* Carl Sauer author of *Man's Role In Changing The Face Of The Earth* University of Chicago Press, observed *"Wherever primitive man has had the opportunity to turn fire loose on a land, he seems to have done so, from time immemorial; it is only civilized societies that have undertaken to stop fires"*. Fire has been introduced by man onto every continent on the Earth. Hunting peoples in Argentina, South Africa, New Zealand, Ceylon, the South Pacific, and South-East Asia all set fire to the brush to improve grassland for game. (As one researcher observed of the Australian aborigines; "Perhaps never in the history of mankind was there a people who could answer with such unanimity the question, 'Have you got a light, mate?'")

Others researchers note that even the tropics, long hailed as the last true untouched wilderness, appear to have been heavily shaped by man. Charcoal has been found buried in the soil virtually everywhere in the tropics. Radiocarbon dating of charcoal samples from a seemingly unspoiled tropical wilderness in Costa Rica and Panama shows that the supposedly unsustainable "slash-

and-burn" agricultural practices that began as long as six thousand years ago, has been sustainable throughout all the intervening years.

We have to accept that in many tropical grasslands man may indeed have been the only significant source of fire, and so man himself created much of the grazing lands. The tropical savannas and grasslands of the world are not so much a wilderness as a garden. Ancient man evolved into a grassland animal himself and ancient man simply burned down the forests to expand his habitat.

The more one delves into this completely new gambit of ecological imperatives, the more one becomes aware of a common thread, a consistency of purpose unrelated to environmental values. It becomes glaringly obvious that the apparent significance of an ecological issue, the media attention it receives and the number and fervour of its supporters, is exactly proportional to the benefits that accrue to fossil carbon industries by furthering that particular ecological cause. The slightest suggestion of a risk to biodiversity is manna from heaven to the fossil carbon lobby. They will ensure it is highly publicized, and possible threats magnified out of all proportion to suit the motives of the marketers of their products.

Their guiding principles are at least consistent. They like to have areas of farmland and potential farmland locked away to encourage intensive agriculture. They want any river with hydroelectric potential to be declared sacrosanct, along with anything else that threaten the sales of fossil carbon materials. To achieve these aims any biodiversity-environmental cause will suffice. The petrochemical industries are heavily dependent on locking up the constantly regrowing, timber resources of the world's forests. Biodiversity causes are perfect to help achieve these aims. Biodiversity becomes their triple-edged sword (if such a thing existed). With one fell swoop they can achieve all their objectives.

It is no wonder that biodiversity has become the new age environmental issue, and so extremely worthy of support from all "responsible" oil, coal and natural gas producers.

But there are other ways of preserving a special species. If the numbers of some really unusual animal or plant are down to the point of possible extinction, we can now quite easily preserve their DNA. Some day soon even *Jurassic Park* may well become a true story. If the DNA of dinosaurs had been preserved by the low temperature storage techniques we now have, there would be no problem in recreating them.

Our enormous use of defoliants and pesticides in eradication programs was the most serious threat to biodiversity. Now Global Warming and cancerous climate change is leaping ahead of even those dangers.

In regard to defoliants and pesticides, perhaps the biggest culprit is the cotton industry, firstly in the United States and now Australia and other countries. The cotton plant is a perennial, growing and flowering continuously from year to year throughout its life. Long established practice however has been to treat cotton as an annual crop to be planted in early spring and harvested in late autumn. The timing of the harvest is important because the cotton fibre must be clean and not contaminated with leaves, as such contamination will greatly reduce its value.

Harvesting in the past took place after the early frosts of winter had killed off the foliage, allowing the leaves to drop. Today, with faster maturing varieties and pre-planned mechanical harvester schedules, growers do not wait for nature's natural defoliation by frost. Chemicals are used instead to kill off the cotton plant at a time that suits the grower. Every year, millions of acres of cotton are sprayed with chemical defoliants.

Being a huge mono-crop operation, with little emphasis on plant health, cotton production suffers badly from insect pest problems. So now and for several decades past, cotton growers have been dosing their fields with enormous quantities of potent and powerful insecticides. Approximately 40,000 tons per year of insecticides are sprayed on cotton crops in the United States alone. At the same time around a million tons a year of chemical fertilizers are used to get the plant ready for harvest.

The Environmental Protection Agency considers seven of the top fifteen pesticides used on cotton in the United States as "possible," "likely," "probable," or "known" human carcinogens. Those chemicals are acephate, dichloropropene, diuron, fluometuron, pendimethalin, tribufos, and trifluralin. There are probably many others.

Cotton growers in the United States have undertaken huge programs to totally eradicate pests such as the boll weevil. Even the cotton growers admit that beneficial and useful insect species are wiped out by the insecticides. Over 14 million acres of cotton was "grown" in the United States in 2000. It's probably fair to say the total biodiversity over all this area amounts to just one species, and that's cotton – two if you count humans.

In contrast to cotton with all its problems we have industrial hemp, (discussed in Strategy 41) which actually needs no chemical to produce a useful and economical crop, although small quantities are often used. Hemp is obviously not a favourite of the agrochemical industry.

Insect life and grasses aren't the only ones at risk of species annihilation through chemical overuse. Researches in the United Kingdom are now discovering that although agricultural use of single pesticides or insecticides, at the listed safe recommended doses, do not appear to harm bird life, combinations of these chemicals can be lethal to them.

Chemically stimulated agriculture on soil with depleted organic matter produces sickly crops. Healthy crops, like healthy people, are extremely disease resistant. Sick crops more suit the palate and digestive system of insects. Birds then eat the insects. Birds, once upon a time, were the main biological control mechanism limiting insect populations.

Some pesticide sales people might well delight in these poisonous cocktail formulations. The pesticides can be sold to the farmer to kill his insect pests, but then at the same time their use will kill off the insect-eating birds. So even more pesticides will be needed.

Your local ecological enthusiasts and green protesters can never prevent the annihilation of species by waving banners while happily ignoring factors like Global Warming and agrochemical poisoning. Yet they protest about any and every perceived environmental change with the glaring exception that no serious action is allocated to Global Warming. Why is this so? Global Warming-induced climate change, along with coating all the world's agricultural lands with stimulants and poisons, are the overriding factors that threaten biodiversity on this planet. It is pathetic that the very concept, the very essence of protecting biodiversity has been manipulated to suit the marketing of the products most likely to force a massive loss.

If there is one all-pervading mass of monumental nonsense that is totally distorting environmental logic and common sense, it is the sublime belief in the utter permanence and invariance of ecological systems. We are often asked, or more often it is demanded of us, that we cease to influence systems that mankind have been drastically influencing for as many as sixty thousand years. We are expected to fence off vast tracts of land, at incredible cost, to encourage the formation of "natural" areas that in reality have never previously existed. We are ruthlessly and vigorously prevented from burning off scrublands that in reality we have controlled with fire for untold millennia. We are told we are an interloper on a planet that gave us birth, and we are constantly told it was a better place before we got here.

And while this is happening we are also being conditioned to accept that the only serious environmental structure that we can neglect with reckless and irresponsible abandon is the very air that envelops and protects our planet.

Budiansky himself emphasizes in *Nature's Keepers* the reality of the innate randomness of natural systems. He reminds us that there is no right system nor is there any wrong system in nature, nor is any system in any way innately permanent. This is quite a profound concept and for many of us it will take time to really appreciate its broad significance. He says succinctly,

"One thing is clear: To leave nature to her

own devices is no guarantee that what is here today will be here tomorrow. Nature has no eternal plan, no timeless purpose. It is ever-changing a creature of the endless geological upheavals that are as old as the planet itself."

If it were not so we humans would never have evolved. Budiansky also states:

"The idea of a risky nature is one that is hard for many people to swallow. Environmentalists recoil at the notion precisely because it seems to give man license to transform nature at will. If what is here could just as well have been something completely different, then what is wrong with turning forests to deserts or prairies to cattle ranches or wetlands to sugar cane fields? The honest and uncomfortable answer is that from a scientific point of view, there is nothing at all wrong with these things. The specter of ecosystems collapsing like a house of cards to the destruction of all life on the planet, ourselves included, if but one piece is tampered with, is one of the more successful myths of the modern environmental movement, but it is a distortion of ecological reality. An ecosystem is not a living organism that dies of infection if it gets a scratch or even bleeds to death if it loses a limb. Ecosystems are ever changing, dissolving, transforming, recombining in a kaleidoscope of new forms."

One thing that *Nature's Keepers* certainly does is force us to think.

The equilibrium and Balance of Nature believers, advocate and indeed demand what they themselves consider ecological systems "ought to be". Balance of Nature believers do not like to recognize what the real world actually "is". They don't want to know that the Earth, and all its ecological systems are slowly and constantly changing. They don't want to know that it has always been like that and it always will be like that. That's Darwinism, and Darwinism doesn't suit their vision of enviro-political control.

The successful life forms on this planet today are the ones that do change and do constantly evolve. Even evolutionary rates have evolved to allow timely change. It seems that under extremely stressful environmental conditions, biological mutational changes are somehow enhanced and evolution actually speeds up. So when evolutionary changes need to happen in a hurry, they can. So the successful ones evolved much better than the ones that aren't here now. But that still takes more time than we are giving with Global Warming.

In *Nature's Keepers*, Stephen Budiansky reminds us that, "*for at least a hundred thousand years it has been largely man who has chosen nature's path for her*." That is reality. It is the reality that has existed on virtually every island, and on every continent, on the face of this planet of ours. It is wrong to expect us to feel guilt or shame. In fact it's an invigorating realization that both the planet and mankind are evolving in conjunction. And we always will.

There are people in our affluent societies who do not produce any goods, who do not supply any services, who grow no food, who mine no minerals and who effectively contribute nothing to society, yet crave power. They want influence, and they even want respect, and they want it without earning it and they want it without deserving it. By hitching themselves to the new biodiversity cause they create and acquire their own momentum, their own juggernaut, with powers out of all proportion to its worth to any human society.

Genuine and responsible thinkers, people who appreciate life's realities, and are prepared to do something constructive to improve those realities, are constantly having their efforts trampled under by these endless orchestrated biodiversity stampedes.

Biodiversity is proclaimed to be "under threat" if the numbers of individual plants, animals, birds or reptiles, or now even insects, of any species whatever exist in less than plague proportions. Biodiversity can be claimed to be under threat if the population of anything appears to be just declining in any way whatsoever and in any place. The immediate conclusion then reached is that the "habitat" (that all embracing term) for the nominated species must therefore itself be under threat. A "cause" has been created. A "cause"

has been manufactured to suit some perceived marketing imperative.

This process is the fundamental all-embracing maneuver to justify never ending claims for power, influence and interference in almost all human affairs. And the strings that juggle that power are very slippery and generally lubricated with oil.

It is no coincidence that implicit within these biodiversity arguments are always solutions that result in the expanded use of petroleum based plastics and highly energy-dependent materials and fossil fuels.

Look at history. All idiotic causes, no matter where, no matter when and no matter how poisonous, are always held together with carefully twisted fine threads of truth. The biodiversity industry is the same. There are definitely a few species of animals, of birds and of reptiles that actually are under genuine threat of annihilation and we should do what we can and what is practical to save them. However all too often the genuine become irrelevant and are all too often get lost in the sidelines of manufactured "causes."

Like all the best marketing strategies, biodiversity has now taken on a life of its own. It is now a massive "industry" in itself. Taxpayers are forking out millions to fund endless studies and create endless regulations that feed and foster this bloated science fiction. It is all to keep our minds off the very real problem of an overheating planet. Biodiversity is yet another excellent example of the principle of the "big lie".

> *"The great masses of the people...will more easily fall victim to a big lie than a small one."*
> Adolf Hitler "*Mein Kampf*" 1925.

It is frightening but we now have to recognize the deliberate creation of a mindless juggernaut, marching under the banner of biodiversity and marching to the manipulated beat of fossil fuel drums.

Could there be any other motivation for the creation of this juggernaut of fiction? Is it just happenstance? It seems unlikely. One wonders what Sherlock Holmes would conclude. Or do we remind ourselves of Ian Fleming's words in *Goldfinger* "Once is happenstance. Twice is coincidence. Three times is enemy action."?

The geology and the climate of the Earth are constantly changing, and life on our planet is constantly evolving to accommodate for those changes. Slow change allows life to adapt. But life and evolution simply cannot adapt to rapid changes from either meteoric impacts or human induced Global Warming. Both biodiversity and human society will be severely damaged by Global Warming. But Global Warming can be stopped, and it must be stopped.

Apart from Global Warming *Homo sapiens* have most definitely been slowly modifying the planet for at least one hundred thousand years, and we will continue to do so. And I see nothing wrong in that.

If I were a visitor from another world, I am sure I would find this planet a much more interesting place to visit now than it was one hundred thousand years ago, before the age of man.

Well I am not a visitor. I live here, and while I concede that we make a few mistakes as we learn, I for one, am proud of the achievements and accomplishments of my fellow man.