

*This document presents both the slides and extensive speaker's notes used in a recent presentation to the Society of Petroleum Engineers in Melbourne.*

\*\*\*\*\*

## SPE Luncheon Presentation

Ted Metcalfe  
15 October, 2014

Thank-you to the SPE Committee for allowing me to present here today. Hopefully this is a mutual opportunity ....the SPE needed a speaker for this October meeting and I was looking for an audience to test reaction to this presentation.

As mentioned in the notice of meeting, this is a departure from normal SPE topic material, and I clarify again that the material presented is my personal opinion and not any reflection of SPE policy.

So why have I prepared a presentation?

A few years ago I became frustrated by the ongoing debate about global warming, because it just didn't seem to be decisively proven one way or the other. It didn't help me at all when "global warming" became difficult to prove, and they switched the terminology to "climate change" for which more evidence could be claimed as proof, even though we've always had severe weather events.

So I started reading a lot about both sides of the argument in order to work out which side I was on, Climate Change Believer or Climate Sceptic. Since I don't trust either journalists or bloggers, I read mostly real books published by authors who spent the time to develop and present largely coherent and comprehensive arguments. I read not only about climate change but about other relevant global issues as well. The more I read the more frustrated I became, eventually realising that the most serious issues facing our world were not about climate change at all!

It became clear to me that the climate change debate is seriously flawed however no one seems to want to talk openly about the real drivers behind the issues, because those are the elephants in the room, and talking about them makes people either indignant or uncomfortable.

It's really not about science at all:

- It's about history, and whether or not we can acknowledge that we have significantly changed the world around us in a very short time.
- It's about mathematics, and whether or not we are prepared to do the calculations and the cost estimates and then acknowledge the results.

I felt a need to begin to summarise all of my observations and thoughts somehow, and found that using PowerPoint allowed a combination of bullet points and schematic illustrations to record my observations.



The original title for this presentation was just "The Global Engine" for reasons you will see illustrated shortly.

That didn't seem catchy enough, and I recalled reading about a university researcher seeking funds for a research project titled "The Mating Habits of Urban Grey Squirrels". He was unable to obtain funding for his research, so he decided to revise the name of his project to "The Impacts of Climate Change on the Mating Habits of Urban Grey Squirrels". He got his funding immediately. The term Climate Change is indeed a real attention grabber.

If you feel uncomfortable about some of the material I present here, don't expect me to apologise for upsetting you. I will thank you for getting the message, but you are responsible for how getting the message affects you.

## Basics of the Debate

- Anthropogenic carbon dioxide emissions either are or are not causing global climate change.
- The main focus is on limiting production of carbon dioxide emissions and/or finding ways to sequester those emissions.
- The IPCC of the UN has claimed authority status on the matter, but credibility cracks continue to emerge and dissenting voices persist.
- Those who question or challenge the causes of climate change are branded Climate Sceptics.



## What's your opinion?

- Hands up if you are not a Climate Sceptic.
- Hands up if you are a Climate Sceptic.
- Hands up if you are confident that you know what defines a Climate Sceptic.

## "Climate Sceptic"

Hands up if you believe:

- The world is getting warmer.
- Anthropogenic carbon dioxide emissions are causing more warming than natural solar radiation.
- Climate change can be accurately modelled, including the impacts of clouds and water vapour.
- Reductions of carbon dioxide emissions can actually be achieved, effectively, and on a global scale.
- Carbon dioxide emissions are indeed the real problem.
- It is possible to achieve an effective global resolution to any problem.
- You are qualified and experienced in climate science.



## This Reader's Observations

- If "the science is settled", why does the world not act to resolve the issue? Do they not believe?
- The climate change debate is disturbingly similar to religious fundamentalism.....scientists on both sides are shouted down by "believers".
- The media supports whichever side is currently most controversial, with no interest in the facts.
- A tax on carbon emissions is just a revenue grab.
- The climate change debate critically fails to acknowledge the **elephants** in the room.

## Some questions not being addressed in the Climate Change debate

1. Who is the "enemy" in addressing climate change?
  - The sceptics?
  - Procrastinating governments?
  - The fossil fuel corporations?
  - The fossil fuel consumers?
  - Is there some other group which can be blamed?
2. Why are we burning more and more fossil fuels?
3. Why is economic growth considered to be mandatory?
4. What is the maximum world population?
5. Is climate change a problem or a symptom?



## Alarmists and Sceptics actually have some Common Ground

Common features found in books on both sides:

- Emotive rhetoric, glowing praise for their supporters.
- Exaggerated smear and disdainful dismissal of the opposing side.
- Implication and innuendo using endless quotations and references from supposed authoritative sources.
- Significant repetition in points being made.

This isn't science, it's Psychology.....a battle for hearts and minds of the public.

## Historical Perspective

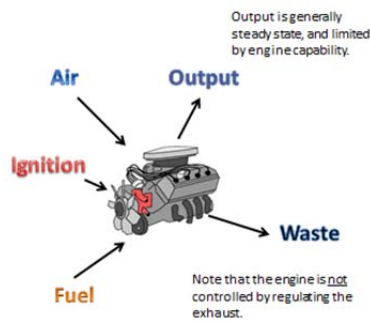
It's useful to consider some relevant timelines:

- Plant Earth has had four major Ice Ages (over 500 million years)
- Homo Sapiens and Agriculture (about 10,000 years)
- Religion and Iron (more than 3,000 years)
- Scientists, Engineers and Economists (less than 300 years)
- Climate Change anxiety (maybe 30 years)



## Humans and Engines

- Human beings once formed part of the natural world environment in a sustainable manner.
- Then we invented steam engines and internal combustion engines, and our capabilities for consumption and growth expanded rapidly.
- In using engines for power and transport human beings now effectively act as one huge engine, as we consume not only fossil fuels, but the world environment around us.
- Humans beings have turned the world into a Global Engine.

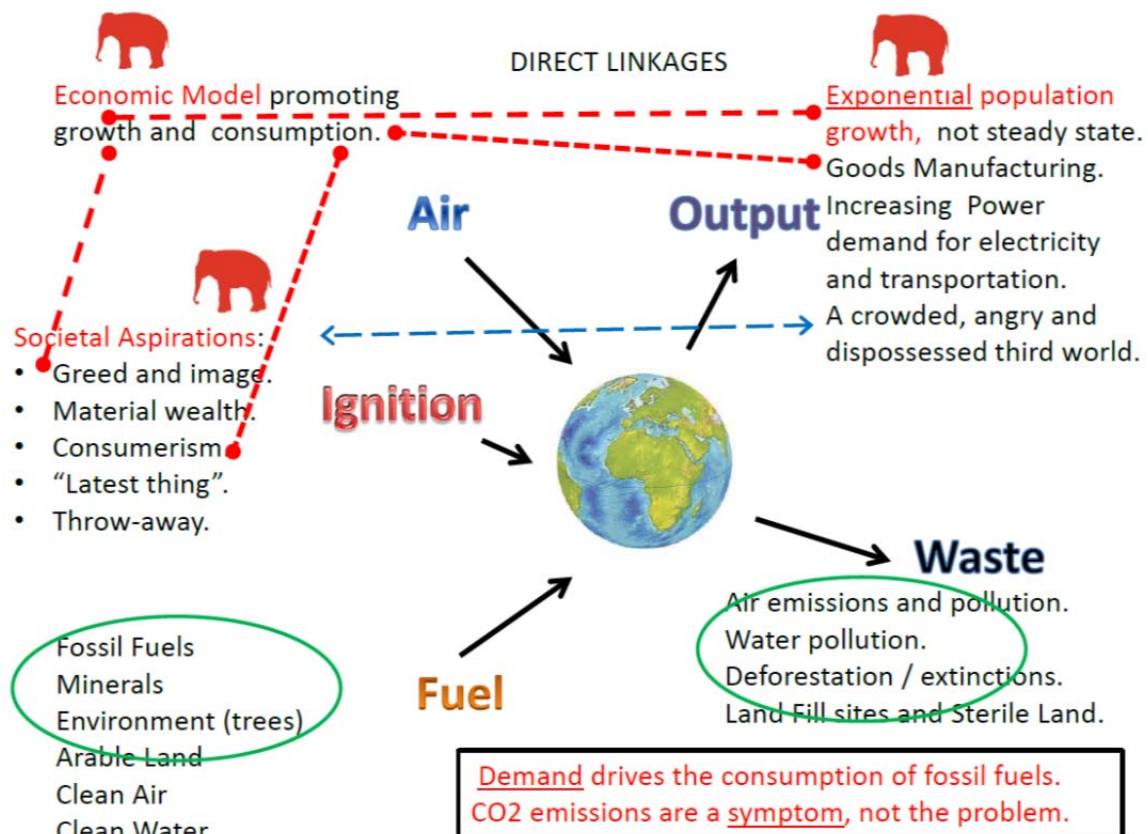


I found that by using the engine analogy, I was better able to illustrate some of the global impacts of the human species on the Planet as identified in the books I had read.

Here are the five basic elements of any fuel-burning engine.

As shown following, these five elements are also reflected on a global scale, and I have assigned key issues to each.

The economic model provides the turbocharger for the Global Engine, and societal aspirations are the spark.



*(This slide has more impact when developed incrementally, but the completed slide is still informative.)*

The direct linkages represented by the red dotted lines are strong relationships which significantly influence our impacts on the Planet. The blue dotted line effectively illustrates the interface between the affluent Western world and the Third World:

- In some ways it is the Information Highway – They see what we have and they want it.
- It's also about Social Networking; a Western technology development which provides a means of mobilising huge numbers of disaffected persons to action.
- This is the line that Boat People and Refugees follow seeking a better life.
- Terrorists exploit the blue line to exert influence on their enemies, and most recently we have seen jihadists travelling the other way.

It's time to meet the Elephants in the Room:

**POPULATION** – The Great Taboo - Cultural and religious teachings have always told us that more children is better. There have been some objectionable attempts to control human population, and no one wants to stand up and advocate management of human population levels. However, I have seen evidence that there are ways to do this which have been proven effective.

**ECONOMIC MODEL** – Free Market Capitalism requires growth which requires consumption of resources and generates waste. The rich get richer, and governments of every country either actively assist them or are powerless to stop them. This elephant will be very difficult to change, since that would require the rich to agree to share with the poor. The “Occupy Wall Street” movement actually had a point, but they were unable to articulate any feasible alternative.

**SOCIETAL ASPIRATIONS** – These are also very difficult to change, and proposing any wholesale changes here will not gain any friends! Not only is it integral to our very nature; most people consider it a right of achievement that they should be able to consume, acquire, and spend as they wish if they can afford it (and sometimes even when they can’t).

Meanwhile, where is the focus of the Climate Change Debate?? With very few exceptions, the environmentalists and climate alarmists devote their energies to either the Fuel or the Waste, as circled in green.

In the Fuel area, they are protesting drilling, mining and fracking, and chaining themselves to trees and coal loaders. Climate Change protesters cheerfully attack large corporations, but they lack the intestinal fortitude to challenge the real culprits, who are us as individuals:

- Are Greenpeace activists chaining themselves to the pumps at your local petrol station demanding that you stop filling your car with the dreaded fossil fuel?? No!
- Is the Lock the Gate Alliance running around the suburbs of Sydney telling customers to shut off their gas supply in protest against fracking?? I don’t think so.

My comment on their attentions to the Waste element is this: “If you believe that getting rid of all carbon dioxide emissions by permanently stuffing them down a hole in the ground is even feasible, you had better put some fresh batteries in your calculator. The numbers in terms of development costs and emissions quantities to be handled are beyond understanding.”

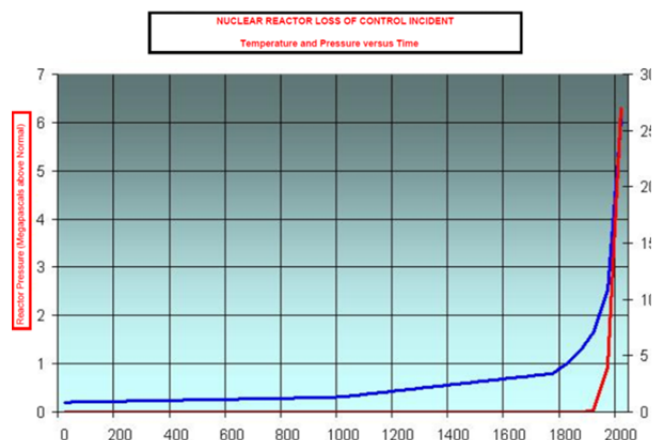
It is Demand that is driving the fossil fuel business, and the carbon dioxide emissions are a symptom, not the problem. It is not those who profit from producing the fossil fuels who are most guilty, but those who purchase the products. That’s us, folks.

## Is Nuclear Power an Option?

Nuclear power has some issues:

- Hiroshima and Nagasaki
- Cold War and threat of nuclear holocaust
- Three Mile Island, Chernobyl and Fukushima accidents
- Waste disposal solution?
- WMD in terrorist hands?

We’re terrified of the technology!



And seemingly our fears are well-founded. This graph represents the temperature (in BLUE) and pressure (in RED) in a run-away nuclear reactor which has failed and is out of control.

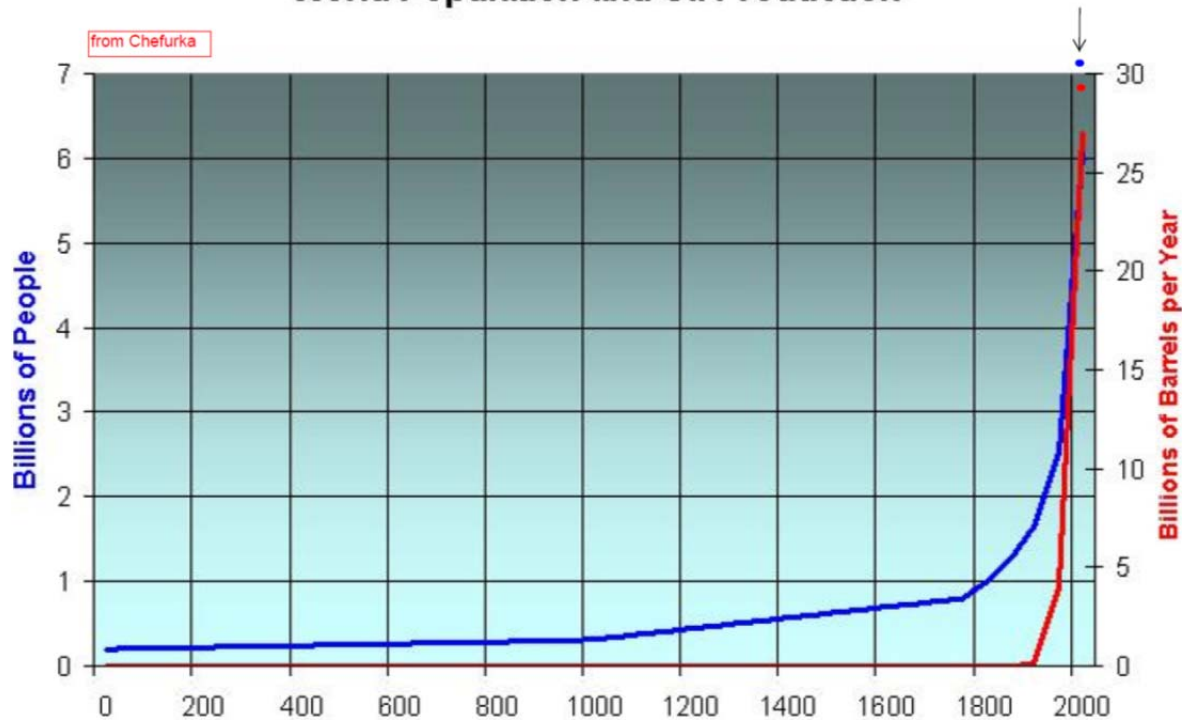
The graph starts at midnight and over a period of several hours the **Temperature** climbs, first slowly then rapidly. Then the **Pressure** starts to spike as well, and by about 8:00 PM things are seriously escalating.

- It is obviously a situation of significant alarm.
- It is obvious that those in charge must make rapid decisions on corrective actions to prevent imminent catastrophe.
- Power Plant Operators must quickly pull the fuel rods and let the power demand grid consume the excess power, then switch off to investigate and repair.

Only one problem my friends.....this is not a graph of a run-away nuclear reactor.

I lied about the Labels.

## World Population and Oil Production



Same graph, same data.....different labels.....the real ones. In the top right corner are dots to update the data to this year. (Credit to Paul Chefurka; I pinched this from his website.)

Alarm bells are certainly ringing, but the trouble is.....most of us either dismiss or ignore the alarms, and no one is in charge.

The closest thing to “management” we have here is the United Nations, a toothless committee of bureaucrats with competing interests and hidden agendas; reacting to the pressure of governments and lobby groups. The UN has proven to be useless in a crisis.

There are no power plant operators here and there is no switch to shut down the system.

We can’t pull the fuel rods and switch off the load in this runaway reaction because there is only one engine, and the load is real live human beings who eat every day and place continuing demands on the environment.

Without fuel in the Global Engine, millions will die.

Some of you may be familiar with studies of populations of animal species which grow beyond the carrying capacity of their local environment, reach a peak, and die off in a catastrophic manner.

The species represented here is not rabbits or rats, it is the human species on earth, but the analogy of too many rats in the cage is appropriate. Isn’t it curious that when a wild animal species overpopulates an area, Parks and Wildlife officers conduct a cull, because that is the “humane” thing to do for the species. We don’t handle the concept of “humane” so well for our own species, however we will soon be forced to find better ways to manage our own numbers in order to stabilise our population.

If we don’t, ultimately it is Mother Nature who is in charge and she will take control.

Mother Nature is not the benevolent, kind and forgiving entity that we like to envisage.....Mother Nature is a Bitch.....Fight for your food or die.

So why do we continue to dismiss or ignore these alarms about **climate change** and about **population growth**????

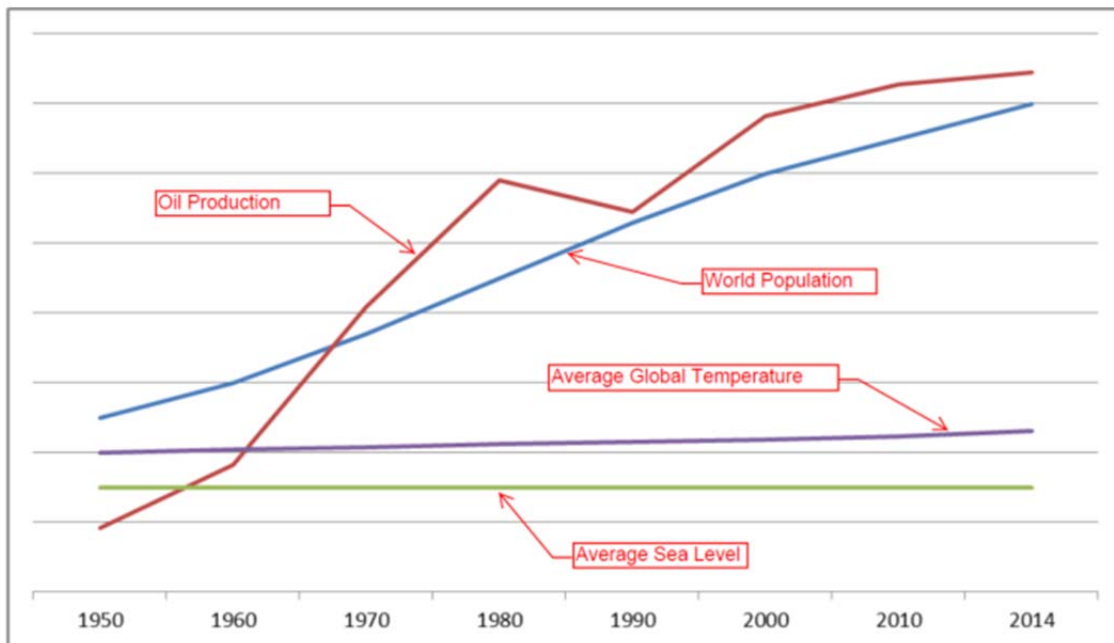
## Why are we not scared?

(C. R. Sunstein – Harvard; the White House); (POT)

- There is no **P**recedent – no one alive has experienced the climate change impacts being forecast, so the threat is easily dismissed.
- There is no obvious **O**wner – No one group or entity stands out as the party guilty of causing climate change, so there is no target for outrage.
- The **T**imescale of impacts is both protracted and uncertain, and no genuine sense of urgency can be conveyed. Wait and see is a real option.

There was an article about the relevant human psychology factors in the Sydney Morning Herald last year written by C. R. Sunstein, a professor at Harvard and former advisor to the White House. I summarise here his three key points, to which I have further allocated the acronym “POT”.

Sunstein’s article led me to further focus on the differences between the time frames of human history and our approximate memory span.



Here’s the same data from the population growth graph, but plotted only over the approximate time frame of persons alive on the planet today.

Data which appeared to be almost vertical in the previous graph is just a steady increase in our living memories, and that fits in very well with our economic growth models.

The threatened consequences of increasing temperatures and rising sea levels are barely perceptible in living memory for any of us, and we have never personally experienced extremes of either.

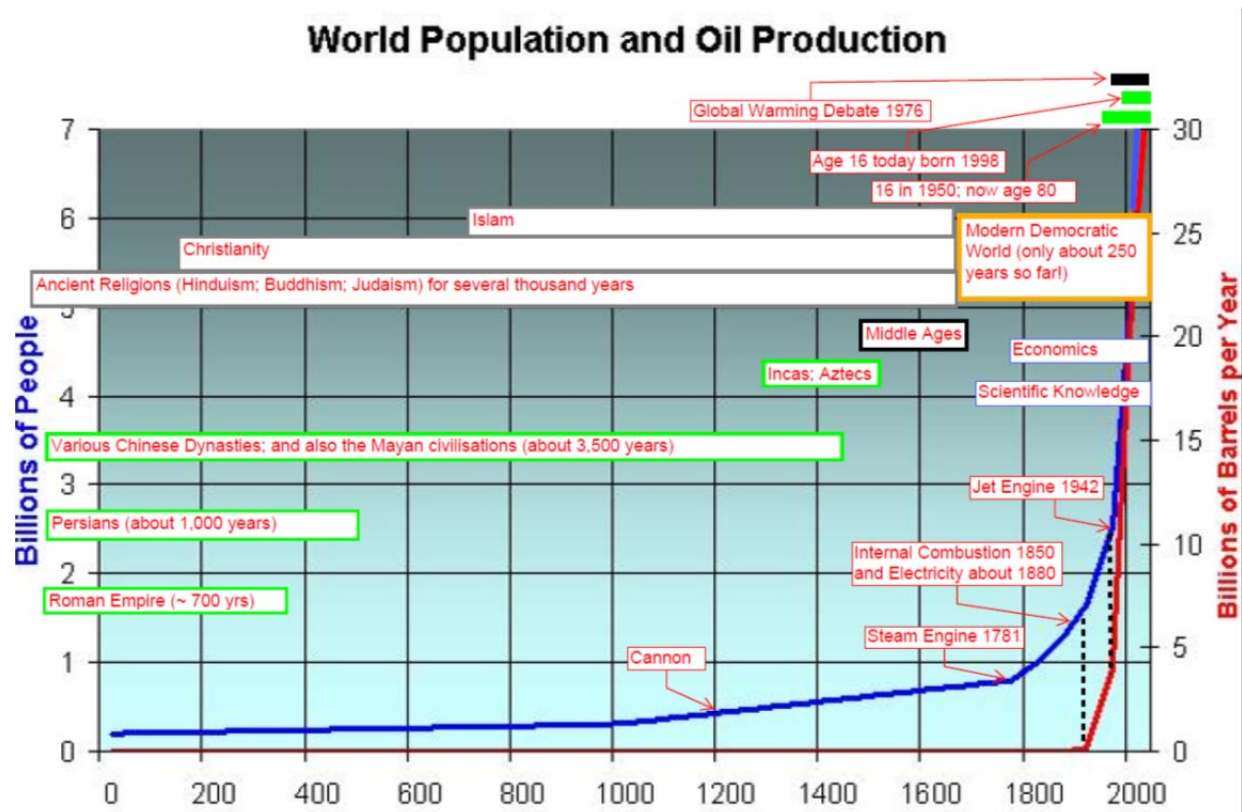
**We tend to view our impact on Planet Earth through a very narrow window in time.**

By limiting our time perspective to our lifetimes, we can more comfortably enjoy short term benefits generated by our actions, while dismissing the long term negative consequences of our actions.

It is easy to shrug and say “I won’t be around by then!” and we all do it.

Our personal perspective of history bears no relation to the history of the human species on the planet.

Let’s match a bit of our history over the last couple of thousand years with the data on the population increase chart.



Back when Jesus wore sandals there were not a lot of people on the Planet Earth. It stayed that way for a very long time.

Various Civilisations have existed for thousands of years. By the end, the Roman Empire had been around for about 700 years, and the Persian Empire and the Chinese dynasties lasted much longer.

Ancient Religions have been around for thousands of years, Christianity and Islam have been with us for several hundred years.

**It is informative to reflect on our technological achievements and the impacts of those developments on population growth and on oil production.**

Starting with the Cannon, (if that can be deemed an achievement) we developed muskets and rifles and handguns and machine guns, and while we got better at killing each other, the population still increased, because those with guns were better able to steal from those who didn't, and thereby achieve an easier lifestyle. Thus ended the short-lived civilisations of the Incas and Aztecs, conquered by the Spaniards stealing the gold.

Both the invention of the steam engine in the late 1700's and then the internal combustion engine and electricity in the late 1800's had direct and significant impacts on the rate of population increase, as shown by the inflection points on the curve trending to higher rates of growth.

Note too that the production of oil got a real kick-start with the invention of these engines, and since the development of the jet engine late in World War Two, both population and oil production have been rocketing upward.

Our knowledge of modern Science was influenced by Galileo in the early 1600's, but really got going thanks to Newton and his colleagues in the late 1600's.

Modern Economic theory evolved when Adam Smith wrote the Wealth of Nations in 1776, which was by coincidence the same year in which the USA declared independence and constitutionalised their version of democracy.

The concept of democracy actually goes back to Cromwell around 1650, and therefore our Modern Democratic World has existed for only 250 to 300 years; a very short time when compared with previous civilisations spanning thousands of years.

Our concept of Living Memory is even shorter compared with even recent history of the human species on earth.

In the top right you can see the life spans over which people today have personally experienced the development of the human species on earth, and the time during which we have been worried about the environment.

We are very proud of our technological developments, despite the obvious evidence that those achievements have significantly accelerated population growth.

It is very important to note as well that previous civilisations were geographically localised, and there was always somewhere else to go if they stuffed up their environment. In less than 300 years, we have expanded into every inhabitable place on earth, have gone from less than one billion to more than seven billion in number, and we are making a mess of the place.

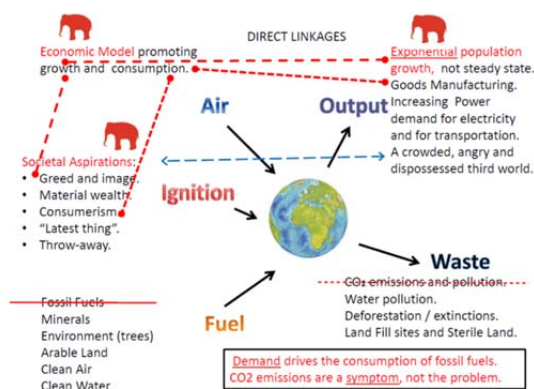
Religious and cultural beliefs have guided human thought and action for thousands of years, yet our understanding of science is a relatively recent development. It's no wonder we sometimes get confused between the science which represents what we know; and the faith and optimism with which we believe. (*I consider that any large group of people with common beliefs represents a religion. Similarly, a large group of people sharing factual knowledge is science.*)

We are where we are, with both good outcomes and bad, because of the relatively recent works of Scientists, Engineers and Economists, in the absence of any effective total world leadership.

**The very powers of complex communication and logical reasoning which differentiate us from the monkeys are the same powers which allow us to convince ourselves that we have things under control, and that we can solve the problems of the world.**

The Climate Change Alarmists continually demand that “Action must be taken now!”; however they are most often woefully short on details regarding exactly what action must be taken and by whom and at whose expense.

Let's explore a couple of scenarios which achieve the objectives of the climate alarmists and environmentalists....



Just suppose we did manage to find a replacement energy source allowing us to stop consuming fossil fuels. Maybe we could finally achieve nuclear fusion? Never mind the significant time and cost required to implement the replacement energy source.

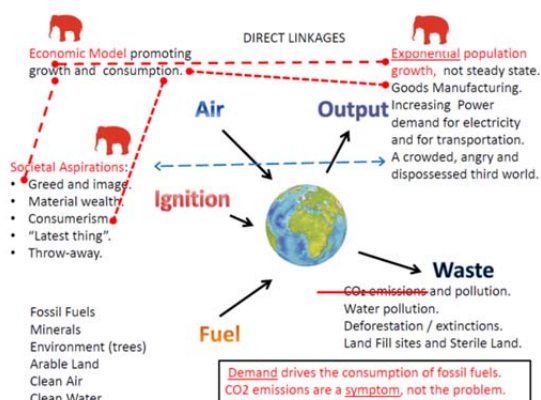
What difference would that make?

I can't quite visualise a solar-powered 747 airliner; or a mining truck with a wind turbine mounted on top, so I think we are stuck with at least some liquid fuel oil production for a long time to come.

We can't pull any of the fuel rods for this runaway reaction without replacing them with something else.

We must continue to consume the environment in terms of minerals for industry, trees for paper products, land for crops, clean air and clean water as the population continues to expand rapidly.

The runaway reaction which is the Global Engine must continue or a very large number of people die a horrible death.



Suppose we somehow mastered the art of Geo-sequestration, and we are suddenly able to make all of that nasty carbon dioxide go away. Or maybe we can develop a new technology to turn it into something useful. (*At least this approach would not immediately destroy the oil and gas production and the coal mining industries!*)

Never mind again the time and cost to implement such significant changes.

What difference would that make?

We are still consuming the environment of minerals, trees and land around us; and spewing out other

Wastes and Greenhouse Gases unrelated to the consumption of fossil fuels:

- Agriculture – methane from cattle.
- Industrial processes and manufacturing (especially the making of concrete)
- Natural sources including bushfires and volcanos.

What happens when we eventually run out of fossil fuels anyway?

All that ridiculously expensive new technology infrastructure is now worthless, and yet we still need more and more of some new fuel source to replace the fossil fuels.

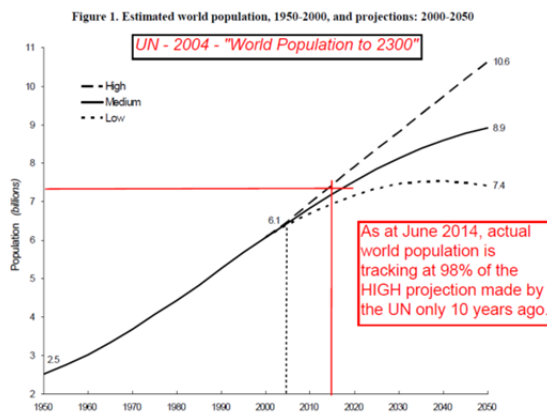
In either case, how long would it take the atmosphere to notice?

Estimates vary, but we know that at the very least it is hundreds of years.

.....and the Exponential Population Growth elephant is getting fatter.

**Focusing only on the Fuel issues and on the Waste issues of the Global Engine will not make any difference unless we also acknowledge and address the elephants in the room.**

- Some authors are prepared to address the **Population** elephant.
- Several authors have attacked the **Economic** elephant.
- Very few to my knowledge have been willing to challenge the **Societal Aspirations** elephant.



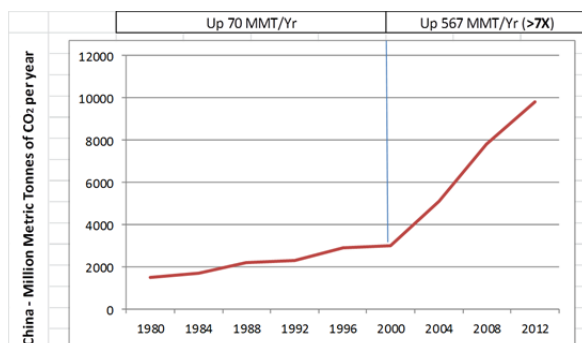
Let's switch topics and examine our ability to even predict our population growth. A major report produced by the UN only ten years ago predicted a range of outcomes for the year 2050.

Turns out we are not very good at predicting population growth, and it's looking higher rather than lower.

| (Population growth, Pollution, and Pace of Development)                           |           |                   |      |
|---|-----------|-------------------|------|
|   | Australia | China             |      |
| Current Population (Millions)   | 24        | 1,367             | 58   |
| Emissions per year (Billion tonnes)   | 0.43      | 9.86              | 23   |
| Emissions per capita (Tonnes per year)  | 18.8      | 7.21              | 38%  |
| <b>What If:</b>   |           |                   |      |
| Half of the people in China remain at their current per capita emissions          |           | 683               |      |
|   |           | 7.21              |      |
| Their contribution to China emissions:  |           | 4.93              |      |
| The other half achieve Australian level of per capita emissions                   |           | 683               |      |
|   |           | 18.8              |      |
| Their contribution to China emissions:  |           | 12.85             |      |
| Total Annual Chinese Carbon Dioxide emissions would be (Billion tonnes)           |           | 17.78             |      |
|   |           | Current China     | 1.8  |
|   |           | Current Australia | 41.3 |
| If achieved over a period of 10 years, annual increase in Million Tonnes per year |           |                   | 790  |

## CO<sub>2</sub> Emissions – Australia and China

I recently spent about a month touring around China, and made some disturbing observations. China clearly is well on the way to westernising, which will directly impact their carbon dioxide emissions. Here's some calculations just to illustrate how that impact would compare with current Australian carbon dioxide emissions, and at what rate they might increase their emissions.



## China's Rate of CO<sub>2</sub> Production

So I thought I should have a look at the recent track record for emissions in China. Annual emissions are now consistently increasing at about 600 MMT/Y, a rate seven times greater than before 2000. This is not a population impact; this is a result of westernisation. And they are doing it with Australian coal and iron ore, and they send manufactured products back to us, so we can't point any CO<sub>2</sub> emissions fingers at China!

## Some Valid Objectives

- Genuine global governance and cooperation.
- Transition to renewable energy sources.
- Educate the third world to help reduce poverty and slow population growth.
- Develop and implement a sustainable global economic model.
- Promote and accept a modest standard of living with increased local trade; and less travel.
- Reject consumerism and material wealth; taking no more than we need. Learn to share.
- Tax greed and excess, not pollution.

## Some Sad Reality

Human beings are not a cohesive and co-operative species able to put aside vested interests for the greater good.

We are divided in a bewildering number of ways which prevent global implementation of solutions.

The Ideals of Man are not being realised:

- World Peace, Eradicate Poverty, etc. etc.
- CO<sub>2</sub> management ?? Sustainability??

Human Nature is part of the problem:

- We strive to **procreate** and **accumulate**.
- Both objectives flourish under a global **growth-based economics model**.

There certainly are some areas where we ought to be making a concerted effort. I have read many examples of studies which clearly demonstrate that increasing education and literacy among the young girls of the third world can directly result in stabilising population growth rates in the next generation.

A sustainable economic model would be nice, but doesn't seem likely anytime soon.

Changing societal aspirations is another valid objective, but human nature is a very strong force.

Human Beings as a Species are divided in a bewildering number of ways:

- The obvious ones are Language, Race and Colour, Gender, and Country of Origin.
- Also of significance are the divisions based on Social Status, Wealth and Financial Status, Form of Government, and Political Affiliations.
- Most divisive and damaging by far is the way in which we differentiate between groups of people based on their Religious beliefs.

All my life I have listened to people banging on about achieving world peace and eradicating poverty, and instead both have only gotten worse. What possible optimism is there for a global solution to managing carbon dioxide emissions or achieving genuine sustainability given our track record in other areas?

## In my opinion...

- The Climate Change debate largely fails to acknowledge and address the real causes of increasing carbon dioxide emissions.
- Markets and consumers drive fossil fuel production; not the producers.
- Population growth and the drive for development in third world countries are far stronger than any environmental ideology forces.
- Even if the world is getting warmer, increased crowding and violence will create far more serious negative impact (and sooner) than any increased temperature or rising sea levels.

The climate change debate fails because the environmentalists either do not understand or are not prepared to acknowledge the bigger picture.

In the end I have come to view the debate as something akin to two large packs of dogs who alternate between barking at each other and barking up the wrong trees.

I have no interest in joining either pack.

## I'm just the messenger!

### Population:

- Population Crisis – Dick Smith
- People and the Planet – Royal Society
- Any commentary by Sir David Attenborough

### Economics:

- Prosperity without Growth – Tim Jackson

### Greed:

- Liars Poker, also The Big Short – Michael Lewis
- The Prize – Daniel Yergin

The concept of the Global Engine and the opinions are mine, but the majority of the material here was gleaned from reading a lot of books and papers relevant to an understanding of global issues. Here are a few recommendations.

Few persons alive today would have a better understanding of the impact of the human species on the Earth than Sir David Attenborough.

The economics book is not easy to read, but at least he does present some potentially credible alternative models.

## Highly Recommended

Cheap - the high cost of discount culture — E. R. Shell:

- The psychology of rampant consumerism and the global impacts of discount selling.

Limits to Growth — 30 Year Update (Meadows et al):

- We have grown too much and we are already in serious trouble, but solutions can be attempted.

The Upside of Down — T. Homer-Dixon:

- World “stressors” are Population, Energy, Environment, Climate, and Economics; which are all accelerated by *Global Connectivity* and by the *Power of Small Groups* to protest and destroy.

## Conclusions

- Continued growth is simply not sustainable.
- There are no easy solutions where there is no global leadership or stewardship of the planet.
- Our real enemies are those among us who promote greed, fundamentalism, and ideology; (and also of course the engines we all use!)
- It is not clear that humans have either the *collective will* or the means to do *anything* effectively other than adapt to changing circumstances.
- Fortunately, we have always done that.

*PS – While you’ve been listening....*

I discovered the book “Cheap” quite by chance, and it really helped my understanding of Societal Aspirations.

I read the original “Limits to Growth” in first year university, and like everyone else at the time, I ignored it. It may be too late now to heed the warnings.

Homer-Dixon identifies the five stressors, but emphasises that two other factors accelerate the impacts. Global Connectivity is the blue line in my previous schematic of the Global Engine. It was 2006 when he predicted the power of protest, and we have been seeing it at work globally ever since, at all recent meetings of world leaders, in the Arab Spring uprisings, in the Occupy Wall Street movement, going on today in Hong Kong, and in the work of the hackers and trolls in our computer systems and social networking systems.

.....and that applies to both economic growth and population growth.

I expect we will survive as a species because we find a way to adapt, not because we find a way to manage global climate.

*PS – Given a current net population increase of about 150 persons per minute, it is easy to calculate how many times the audience has been duplicated in the time it took to give this presentation. Do the math.*



**“We have met the enemy, and he is us.”**

I wanted to finish with Pogo’s observation, because I have heard it many times but had to look up its’ origin.

Turns out that Walt Kelly, creator of the Pogo comic strip was not the first to coin the phrase, but he was the first to use it in an environmental warning.....in 1953, the year I was born!

He used it again in this Earth Day poster in 1971, the year before I went to university and failed like others to heed the messages of the original “Limits to Growth”

The message has been around a very long time, and it would seem we have not been very mindful of the message.

*(At this point the presenter took a few questions, expressed a view that the current population level depends entirely on continued consumption of fossil fuels; and emphasised again the importance of education for young girls in the third world.)*

The following final few slides are some questions which were then put to the audience purely for thought provocation. Some have answers; some don’t.

### Some Questions to Ponder

1. If the wealth of the world were distributed equally, how much would each adult have?
2. Identify the negative environmental impacts of manufacturing and installing photovoltaic solar cells.
3. Which demographic group has the highest birth rate per female in the world? *(For bonus points, explain why that is so.)*
4. What percentage of foreign aid to third world countries is allowed to include birth control advice and family planning assistance?

1. Hint – See the Global Wealth Report issued by Credit Suisse and reported in the news the morning of the presentation.
2. Hint – See “Not for Greens” by Ian Plimer.
3. Hint – It’s not in Africa, and it has nothing to do with either poverty or education.
4. Some of you may not have been aware that much foreign aid is banned from including any form of birth control. The Vatican has significant influence over the World Health Organisation.

### Questions (Continued)

5. Identify the most effective method found so far for managing world population growth and describe why that is effective.
6. How many western countries budget more in foreign aid than they do for military spending?
7. Outline the basic concepts of a sustainable economic model for business and trading on a national level. What would be different for international trade?

5. I’ve already answered this one for you in the presentation.
6. We are generally better prepared for killing each other than we are for helping each other.
7. As mentioned in the presentation, this would be really hard, but continuing with our current model is not an option.

### Questions (Continued)

8. Islamic, Christian and Jewish leaders have agreed to a conference to work out common guidance for all of their followers in attempt to reduce the fighting. You are asked to draft an initial position for their negotiations.
9. Name one billionaire that you respect, and explain why. *Bonus points for more than one.*
10. Name three skills that the humans who survive in the year 2100 will have demonstrated.

8. I like this one. Anyone want to take this on? I didn’t think so.
9. Question from the floor “Does philanthropy atone for greed and excess?” I don’t believe it does.
10. The year 2100 is the end of this century folks. And for the younger members of the audience, this could be your grandchildren we are talking about.

Thanks for listening.

### *Postscript from the author:*

*I pondered for some time the risks associated with providing SPE with a copy of these slides and notes, as I have no interest in engaging in debate with those who may disagree with my observations and opinions. It is also my opinion that others are free to have their own differing views.*

*In the end I have decided to provide this material for distribution to SPE members in appreciation for being given the opportunity to “test drive” the presentation with a real audience; and in the interests of highlighting this important message.*

*I will have to trust the SPE recipients not to post or use the material for purposes I never intended.*

*Ted Metcalfe*

*24 October, 2014*